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"The Freedom to Breathe"

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ABSTRACT BOOK



JUNE 18-22, 2023

National Palace of Culture, Sofia, Bulgaria



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Oral Abstracts

Best Oral for Junior Grant 1

1526

Orbital complications of acute rhinosinusitis in children: A 12-year retrospective review

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Best Oral for Junior Grant 1 | Room 8 Hall 4 - Level 0 | Monday, June 19, 2023

Introduction: Orbital complications account for 80% of acute rhinosinusitis complications and they present most commonly in children. Treatment is generally conservative in preseptal cellulitis and surgical in orbital abscesses. On the other hand, no consensus has been reached on the optimal treatment modality for orbital cellulitis and subperiosteal abscess.

Methods: A retrospective review of pediatric patients that were hospitalized in a tertiary referral hospital with orbital complications of acute rhinosinusitis from January 2011 to December 2022 was conducted.

Results: Twenty-five children with orbital complications of acute rhinosinusitis were included in the study. 12 patients were treated conservatively and 13 patients were treated surgically. All patients with class I Chandler disease were treated conservatively. Of those with class II Chandler disease, 6 (75%) were treated conservatively and 2 (25%) were treated surgically. All patients with Chandler class III and IV disease were treated surgically.

Conclusions: Preseptal and orbital cellulitis can be treated conservatively with good results in most cases. On the other hand, subperiosteal and orbital abscesses usually require surgical management. More prospective studies with a larger number of patients are required to elucidate the role of surgery in orbital complications of rhinosinusitis.



1164

Counseling/rehabilitation for patients of benign nasal tumors in resource poor nations

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Best Oral for Junior Grant 1 | Room 8 Hall 4 - Level 0 | Monday, June 19, 2023

Background: patients of benign-nasal-tumors need counseling. Fear of cancer has to be removed. Poor Counseling/rehabilitation facilities in asia. NGO's play key role in psychosocial-support, Counseling/rehabilitation. Project aimed to formulate policy to give better & cost-effective counselling/rehab-services. Methods: NGO Team consisted counselor & nurse trained. 4 Local traditional faith-healers involved. 11 nurses, 8 counselors trained from 2018. Aim to provide physical-comfort to patient. We Educated patients about outcome of benign-nasal-tumors. Removed fear of cancer. Discomfort/anxiety due to severe pain decreases overall treatment-efficacy. 63 Patients enrolled. Data collected on feedback-questionnaire. Most difficult tasks is revealing diagnosis/its-outcome. 32 subjects of benign-nasal-tumors shifted to specialty hospital due to intractable pain. Results: 94% responded favorably to counseling/nursing care, 80% showed willingness to motivate fellow patients to facilitate supportive-care-program of NGO's. Our Holistic approach helped overcome hopelessness/fear/depression. Pain management/supportive care emerged very serious issue affecting QOL. Conclusion: If resources like fellowship/scholarships are available to NGO-workers, then we can learn from senior-researchers and also show our model to ERS-2023 participants. Restricted resource-limitations didn't permit us to analyze this issue in large-sample-size.

1148

Profiling the Cytokines Patterns in Sinonasal Tissues to distinguish between Chronic Rhinosinusitis Endotypes

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Best Oral for Junior Grant 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Background: Chronic rhinosinusitis (CRS) is classified into endotypes according to the predominant T helper (Th) inflammatory response. Each pattern of inflammation has relevant interventions, however, differentiating between CRS endotypes may be challenging due to overlapping clinical and pathological manifestations. **Objectives:** To profile the cytokine patterns in sinonasal tissues in order to distinguish between CRS endotypes and detect distinctive inflammatory patterns that correlate with refractory disease. **Methods:** Nasal polyps (NP) or uncinat process (UP) were collected from 24 patients undergoing endoscopic sinus surgery (ESS) for CRS with nasal polyposis (CRSwNP) or CRS without NP (CRSsNP) and 6 patients with mechanical nasal obstruction (controls). Expression levels of Th1, Th2, and Th17 proinflammatory cytokines were determined in homogenates of sinonasal tissues by a multiplex immunoassay. **Results:** Elevated levels of IL-13 detected in CRSwNP compared to CRSsNP and controls ($P=0.0247$ and $P=0.0346$, respectively) demonstrates its applicability for discriminating between CRS endotypes. An overlap between CRSsNP and non-eosinophilic NP in terms of elevated levels of IL-6 and CXCL-8, compared to lower levels in eosinophilic NP, was observed. **Conclusion:** Precise diagnosis of CRS endotypes by profiling cytokines patterns can potentially guide treatment selection, especially with the shifting paradigms of CRS treatment and utilization of biologic drugs.



1146

Managing odontogenic sinusitis of endodontic origin - is dental treatment enough?

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Best Oral for Junior Grant 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Endodontic disease with formation of periapical lesions (PALs) is one of the most common causes of chronic odontogenic sinusitis (ODS). It requires close collaboration between otolaryngologists and dentists, but the best sequence of management is still unknown. The aim of presented study is to clarify how radiological characteristics of teeth with PALs and previous root-canal treatment (RCT) influence clinical evolution of the disease and to define the predictive value of its radiological and endoscopic features in necessity of further surgical intervention. 68 symptomatic patients with ODS with PALs were included to the study. The evaluation was performed by otolaryngologist and dentist based on medical interview, nasal endoscopy, cold pulp testing and tomography images. Patients were prospectively followed for at least 12 months, during which nasal steroids, saline irrigations and RCT were administered. The criteria of disease improvement were: decrease of symptoms, healed sinonasal mucosa in endoscopy and radiological resolution of periapical radiolucency and sinus 'inflammation. It resulted that 9 (13%) patients improved after conservative treatment, 59 (87%) required further surgical intervention. Patients who improved after medical and RCT had a greater distance from the top of the periapical lesion to the maxillary sinus 'floor ($p=0.003$). When expansion of PALs and bone destruction toward maxillary sinus was observed on radiological imaging ($p = 0.041$) and when more than one tooth root was affected ($p=0.004$) patients more often required surgical intervention.



1284

Endoscopic sinus surgery vs Dupilumab: short-term outcomes in type-2 CRSwNP

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Best Oral for Junior Grant 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

The advent of Dupilumab has profoundly revolutionized the clinical management of patients affected by Chronic RhinoSinusitis with Nasal Polyps (CRSwNP), whose treatment was historically based on intranasal steroids and Endoscopic Sinus Surgery (ESS). Dupilumab acts by inhibiting the bond between IL4 and IL13 and their receptor, blocking two out of three drivers of type-2 inflammation. Type-2 CRSwNP is associated with scarce response to therapy, high recurrence rate after ESS and comorbidities (allergies, asthma, AERD) thus heavily affecting the quality of life (QOL). In this prospective study, we compare the short-term outcomes of ESS and Dupilumab in patients treated for type-2 CRSwNP by evaluating Nasal Polyps Score (NPS), modified Lund-Kennedy score (mLKS), smell by sniffin' sticks test and QOL with the SNOT22. 21 (47.7%) patients were treated with ESS and 23 (52.3%) with Dupilumab. Our preliminary data showed both ESS and Dupilumab were safe in reducing mean NPS (-5.4 vs -1.1), mLKS (-4.0 vs -2.6), and SNOT22 (-26.7 vs -25.6) scores three months after treatment with no demographic differences. Dupilumab patients reported a higher improvement in SST (+4.1 vs +2.2) and the anosmic rate fell from 91.3 to 34.8%. In the ESS arm, anosmia and hyposmia rates decreased by 23.9% and 14.3%, respectively. Studies with larger cohorts and longer follow-ups are needed for tailored treatments. As of today, Dupilumab appears more suitable for patients with anesthesiological contraindications or previous ESS, whose surgical outcomes may predispose to peri- and postoperative complications



1592

The Surprising Impact of Priming on the SNOT-22

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Best Oral for Junior Grant 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Introduction: Priming is a well-recognized phenomenon, impacting all facets of our lives. We are moved to react to situations based on subconscious cues in the environment. Well known in the world of marketing, it is less studied in medicine, and in particular, in how patients perceive their disease, and how standardized disease-specific quality of life forms may be impacted. **Methods:** 87 consecutive patients with chronic rhinosinusitis (CRS) and CRS with nasal polyps were blinded and randomized to be positively primed (44) or negative primed (43) prior to filling out the SNOT 22. Positively primed patients were administered text emphasizing the eminently treatable nature of CRS and how well people can do. Negatively primed patients read a description of the marked disability CRS causes, and possible complications of untreated disease. **Results:** Groups were matched in age and sex. Median SNOT 22 score in the negatively primed group was 54 and in the positively primed group 20, a significant difference of 34 points ($p < 0.001$). **Discussion/Conclusion:** Psychological priming, both negative and positive, has significant impact on how patient's fill out the SNOT-22. Studies utilizing the SNOT-22 as an outcome measure must take care to minimize this effect.

1745

Dupilumab-Treatment In Patients With CRSwNP: Real World Data

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Since released, Dupilumab has shown great results in treating severe uncontrolled CRSwNP. However, there is a lack of data showing real-world treatment results and it isn't clear to what extent blood parameters are suitable for monitoring the therapy. This study aims to analyze parameters needed to monitor therapy and assess the effect of dupilumab. The following parameters from 104 Patients (male 50, female 54) were analyzed retrospectively after 13 months of observation: SNOT-22, ACS, histologic findings, NPS, olfactometry, FEV-1 and blood parameters (IgE, Eos absolute, ECP). The patients were divided into subgroups to determine whether those with initially elevated blood marker levels showed a different course from those with normal levels. All parameters improved after an observation period of 13 months. SNOT-22 dropped from a mean of 59.9 (SD±18,9) at baseline to 21.6 (±18.7), NPS from 4.75 (±1,59) to 1.58 (±1,25). Olfactometry improved from 3.25(±3,66) to 8.29 (±3,17). Patients with initially elevated IgE levels showed better progression of olfactometry and NPS than those with normal values. Dupilumab has significantly reduced symptoms and disease severity, making it a targeted and safe treatment option in clinical practice. IgE might be a good marker for therapy response. Therefore, further observation is needed.



1400

NAR: are we comparing apples and oranges?

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Best Oral for Junior Grant 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Background: Several phenotypes of non-allergic rhinitis have been described, including rhinorrhoea of the elderly, rhinitis medicamentosa, smokers', occupational, hormonal, drug-induced, gustatory and idiopathic rhinitis. Based on underlying pathophysiological mechanism, NAR can be divided into two endotypes: inflammatory and neurogenic, each of them requiring different treatment approaches. Phenotypes may serve as an indicator of an underlying endotype. The prevalence of each phenotype is currently unknown. **Methods:** Cross-sectional questionnaire-based study in the general population of the Netherlands. **Results:** The prevalence of chronic rhinitis in the general population was 40% (N=558, of those, 65% had NAR). The most common NAR phenotypes were idiopathic (39%) and rhinitis medicamentosa (14%), followed by occupational (8%), smokers' (6%), hormonal (4%), gustatory (4%) and rhinorrhoea of the elderly (4%). The least prevalent phenotype was drug-induced (1%). Nineteen percent of the NAR group could not be classified into any of the phenotypes. **Conclusions:** This is the first study to describe the prevalences of NAR phenotypes in the general population. Our data on the prevalence of phenotypes may help clinicians to anticipate the type of patients at their clinic and help guide a tailored treatment approach.



1438

Invasive fungal rhino sinusitis in adult patients: a single-institution 20-year experience

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Invasive fungal rhinosinusitis (IFRS) is a disease characterized by evidence of fungal tissue invasion demonstrated with histopathology. The acute and chronic forms are defined according to the duration of the illness. A retrospective review was performed and all patients aged > years affected by IFRS treated at our tertiary-care University Hospital of Varese from January 2002 to December 2022 were included in the study. A total of 11 cases (9 chronic and 2 acute) were recorded; clinical presentation, surgical treatment and post-operative outcomes were investigated and presented for each patient. All patients received systemic anti-fungal agents and endoscopic sinus surgery was performed (100%). Among patients with acute IFRS 1/2 died of her haematological disease while 2/9 of the chronic ones died of the evolution of fungal disease (22%). Acute and chronic IFRS are different entities: in acute form, the prognosis is poor, and medical and surgical treatment should be promptly performed. In the chronic one, wide surgical excision of the disease is recommendable to obtain a complete removal of fungal infection. In both forms, early clinical detection is essential but medical findings are non-specific, therefore diagnosis depends on a high index of suspicion, considering the predisposing factors.

1457

Cranial Nerve Zero: What the Rhinologist Needs to Know

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Best Oral for Junior Grant 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Cranial Nerve Zero: What the Rhinologist Needs to Know BackgroundThe Roman physician, Galen is credited with providing the first description of the human cranial nerves. Nearly 2000 years later, in 1878, Gustav Fritsch described a curious slender nerve located rostral to the olfactory nerve (CN 1) in a shark. Fritsch termed this new cranial nerve, "Cranial nerve 0." It was then described in human embryos in 1905 and in adult humans in 1913. Despite, this CN 0 is frequently not described in text books and remains unknown among most rhinologists. **Methods**Literature review and cadaver dissection **Results**Anatomically, the nerve is different from the other cranial nerves. At the cranial base, as opposed to a single defined fascicle, it exists as a plexus medial to the olfactory bulbs with ganglia found on the crista galli. Branches are seen to perforate the cribriform plate along with branches of CN 1. From there, its course in the nose and sinuses is poorly described but appears to descend over the posterior septum and sphenoid rostrum. Based on rodent studies, severing the nerve results in sexual dysfunction with decreased mating. However, it is distinct from the olfactory system and the vomeronasal organ. Its function in humans is unclear. **Conclusions**Cranial nerve 0 is a functionally and physically separate cranial nerve in animals and present in the cranial base of adult humans. Its exact location and function in the nose and sinuses of humans is unclear.



1527

Leukocyte- and Platelet-Rich Fibrin in endoscopic endonasal skull base reconstruction: study protocol for a multicenter prospective, parallel-group, single-blinded randomized controlled non-inferiority trial.

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Best Oral for Junior Grant 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Background Recent advances in endoscopic endonasal transsphenoidal approaches (EETA) for skull base lesions resulted in significantly increased extent and complexity of skull base defects, demanding more elaborate and novel reconstruction techniques improving healing and preventing reconstruction failure which may result in cerebrospinal fluid (CSF) leakage. Commercially available fibrin sealants (CAFS) are currently used to enforce sellar floor reconstruction. However, problems have been reported regarding safety, efficacy and costs. This trial aims to investigate autologous Leukocyte- and Platelet-Rich Fibrin (L-PRF) membranes as an alternative to CAFS in EETA-related skull base reconstruction enforcement. **Methods/design** This multicenter, prospective randomized controlled trial aims to demonstrate non-inferiority of L-PRF membranes compared to CAFS in EETA cases (1) without intra-operative CSF-leak as dural or sellar floor closure enforcement and (2) in EETA cases with intra-operative CSF-leak (or very large defects) in which classic multilayer reconstruction has been made as additional sealing. Patients in three centers in Belgium, undergoing EETA are



randomized 1:1 comparing L-PRF with CAFS. The primary endpoint is postoperative CSF leakage. Secondary endpoints are risk factor identification for reconstruction failure, rhinological symptom assessment, interference with postoperative imaging and a cost-effectiveness analysis. Discussion With this trial, we will evaluate the safety and efficacy of L-PRF compared to CAFS.



1363

Gustatory and olfactory function after petrous bone fracture

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Best Oral for Junior Grant 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Introduction In petrous bone fractures the following impairments are described and regularly seen: auditory dysfunction, vestibular dysfunction, facial palsy/paralysis, CSF leak, lesion of the carotid canal, middle ear dysfunction, but there is little data about the olfactory and gustatory function. The aim of the study is to Investigate olfactory and gustatory function after temporal bone fracture. **Methods** We included consecutive patients with petrous bone fractures. Subjective complaints (Questionnaire), gustatory (Taste Strips) and olfactory (Sniffin' Sticks) function were assessed in all patients. **Results** 131 patients were included with a petrous bone fracture between 2007 to 2017. The type of the fractures: longitudinal 66%; mixed 25%; transverse 9%; extra-otic 84%; trans-otic 16%. We found an ipsilateral half-sided ageusia of the anterior two thirds of the tongue in 12% (n=16) of the patients and only 8 patients report a gustatory change. There is no correlation between the fracture type and the presence of a gustatory impairment. Anosmia is found in 39% of the patients. **Conclusion** Only 12% of the patients had an ipsilateral hemiageusia and there is no correlation with the fracture type. A considerable amount of patients (39%) had anosmia in the testing.

CRS – pathophysiology 1

1134

NASAL POLYPOSIS AND SERUM ALBUMIN – SYSTEMIC EFFECTS AND LOCAL INFLAMMATION

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CRS – pathophysiology 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Objective: Understand the relationship between serum albumin levels and Chronic Rhinosinusitis with Polyposis. **Methods:** Retrospective analysis of 180 consecutive patients between January 2016 and January 2020, at our center. We then divided into groups age and gender-matched – 60 patients with chronic rhinosinusitis with nasal polyposis, 60 patients with chronic rhinosinusitis without nasal polyposis, and a control group with 60 patients. No patient had a history of any pathology that could alter serum albumin. We then compared the level of serum albumin between the three groups. **Results:** The group of patients with rhinosinusitis with nasal polyposis consisted of 60 patients, with serum albumin value of 4.49 ± 0.29 g/dL, whilst in the control group, the serum albumin value was 4.67 ± 0.2 g/dL. We found a significant difference between the group with nasal polyposis and the other two groups evaluated: chronic rhinosinusitis without nasal polyposis ($p < 0.001$) and the control group ($p < 0.001$). **Conclusions:** Lower levels of serum albumin can be seen in patients with chronic rhinosinusitis with nasal polyposis. Further studies should aim its value since it is a non-expensive marker, on follow-up of those patients or even to stratify them according to its endotype.



1145

Chloride intracellular channel 4 induces tissue remodeling via ROS signal pathway in chronic rhinosinusitis

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CRS – pathophysiology 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Fibroblast activation plays an important role in this remodeling process. CLIC4 is known to mediate the activation of cancer-associated fibroblasts. In this study we investigated the effect of CLIC4 on remodeling of the sinonasal mucosa. CLIC4 expression in mRNA or protein level was investigated in the sinonasal mucosa of chronic rhinosinusitis patients and controls. Sinonasal fibroblasts were incubated and treated with TGF- β 1. The expression of CLIC4, α -SMA, collagen type I, and fibronectin was determined by a real-time PCR, or western blotting. ROS expression was determined using 2',7'-dichlorofluorescein-diacetate or Mitosox Red fluorescence. Fibroblast migration was evaluated using the Transwell migration assay and the contractile activity was measured by using the collagen contraction assay. CLIC4 expression level was significantly increased in the sinonasal mucosa compared to the control. TGF- β treatment significantly induced CLIC4, myofibroblast differentiation (α -SMA) and extracellular matrix (collagen type I, fibronectin) production in the fibroblasts. Blocking of CLIC4 expression with siRNA reduced myofibroblast differentiation and ECM production. TGF- β 1 also increased amount of ROS production, whereas pretreatment with ROS scavenger significantly decreased the level of CLIC4 expression, myofibroblast differentiation and ECM production. CLIC4 plays an important role in TGF- β 1-induced myofibroblast differentiation, extracellular matrix production, migration, and contractile activity through the ROS signaling pathway, which contributes to tissue remodeling in CRS.



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Chronic Otitis Media in Patients with Chronic Rhinosinusitis: A Systematic Review

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Introduction: Chronic otitis media (COM) and chronic rhinosinusitis (CRS) are two of the most common otolaryngological disorders. CRS and COM share pathophysiological mechanisms such as bacterial infection, biofilm, and the persistence of the obstruction state of ventilation routes. The purpose of this systematic review was to evaluate all available information on the association between COM and CRS. Methods: The protocol of this investigation was registered on PROSPERO in November 2022. Pubmed, Scopus, Web of Science, and Cochrane databases were systematically searched according to the PRISMA statement. Results: After the application of inclusion-exclusion criteria, four manuscripts with adequate relevance to this topic were included in the review. The study population consisted of 20,867 patients with a diagnosis of CRS, of whom 991 were also diagnosed with COM (4.75%). Conclusions: The included studies have shown that CRS was significantly associated with COM: a global inflammatory process involved the epithelium in both the middle ear and upper airway. The identification of a relationship between CRS and COM may contribute to preventing chronic inflammatory conditions through the early management of the associated disease. Further, carefully designed studies are necessary to demonstrate the relationship between COM and CRS.

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Mouse model of neutrophilic non-Type 2 CRS: the superior effect of *Staphylococcus aureus* compared with *Pseudomonas aeruginosa* and *Streptococcus pneumoniae*

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Chronic rhinosinusitis (CRS) is an inflammatory respiratory disease with nasal symptoms of at least 12 weeks, affecting 11% of Europeans. We find T2 eosinophilic or non-T2 neutrophilic CRS and currently, its pathogenesis is not fully understood, especially non-T2 CRS, for which no validated mouse models exist to study disease mechanisms. Aim: to establish a neutrophilic mouse model of bacterial-induced CRS. Methods: nasal tampons were surgically inserted in the nasal cavity of mice and inoculated with different bacteria: *S. aureus*, *S. pneumoniae* and *P. aeruginosa*. Inflammatory features in nasal mucosa were evaluated after 4, 8 and 12 weeks on decalcified skulls by histology, antibodies and cytokines were measured in NAL and BAL and differential cell-counts were performed. Results: post-operative mortality was important for *S. pneumoniae* and *P. aeruginosa*. Mice with *S. aureus*-induced CRS showed significant increase in epithelial thickness, fibrosis and neutrophilic infiltration at the nasal mucosa, with increased IL-1 β , TNF α , IL-17 and MIP-2. Mice with *P. aeruginosa*-induced CRS showed significantly increased epithelial thickness and fibrosis. Mice with *S. pneumoniae*-induced CRS did not show any changes. Conclusion: *S. aureus* is the most potent inducer of neutrophilic non-T2 CRS in a mouse model of bacterial-induced CRS, allowing us to investigate its pathogenesis.

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Aspergillus fumigatus induce inflammatory cell migration and extracellular DNA traps in chronic rhinosinusitis

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Eosinophilic extracellular trap (EET) and neutrophilic extracellular trap (NET) are commonly found in chronic rhinosinusitis (CRS). Eosinophils and neutrophils are recruited to defense against pathogens through damaged nasal epithelial cells. This study was conducted to elucidate the role of fungi on EET and NET formation. Eosinophil and neutrophil migration were determined using inverted air-liquid interface culture of primary nasal epithelial cells. After stimulation with *Alternaria*, *Aspergillus*, and SEB, we determined migration of cells. EET and NET were determined coculture of eosinophils and neutrophils with fungal conidia and SEB and stained with Sytox Green and calcofluor white for confocal microscopy. To determine the role of reactive oxygen species, cells were pretreated with glutathione or diphenyleneiodonium. Migration study was performed after stimulation with *Alternaria*, *Aspergillus*, and SEB for 6 h. *Alternaria* and *Aspergillus* significantly enhanced migration of eosinophils and neutrophils. However, SEB did not influence cell migration. When the cells were isolated from healthy volunteers, NET formation was significantly increased with *Aspergillus*. However, EET formation did not influence with *Aspergillus* and *Alternaria*. When the cells were isolated from eosinophilic CRS patients, EET and NET formation were significantly increased with *Aspergillus*. Fungi enhanced eosinophil and neutrophil migration through nasal epithelial cells and *Aspergillus* significantly enhanced EET and NET formation in eosinophilic CRS.

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Subjective olfactory dysfunction correlates with radiographic presentation and inflammatory endotypes in chronic rhinosinusitis

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Background Prevalence of olfactory dysfunction is high in patients with chronic rhinosinusitis (CRS), and dysfunction of olfaction impacts quality of life. Sinus opacification, olfactory cleft infiltrations, and type 2 inflammation has been reported to be associated with olfactory dysfunction. **Objective** We aimed to investigate the correlation of CRS phenotypes and endotypes, defined by biomarkers, on one's sense of smell. **Methods** Adult patients diagnosed with bilateral CRS and undergoing endoscopic sinus surgery were recruited. We obtained patient demographics, blood eosinophil counts, blood-specific allergen immunoglobulin E tests, Lund-Mackay computed tomography (CT) scores and related CT findings, 22 items Sino-Nasal Outcome Test scores, and TIB smell identification test before endoscopic sinus surgery. The extent of tissue eosinophilia and expression of type 2 mediators in tissue homogenates were also recorded. **Results** In a total of 128 subjects, 93 (72.7%) cases were identified as having olfactory dysfunction, and 21 (16.4%) cases were asymptomatic. Patient reported symptom score in general were correlated with TIB smell identification test ($r=-0.7223$, $p<0.001$). The 22 items Sino-Nasal Outcome Test total score, Lund-Mackay CT score, ethmoid-maxillary ratio, and olfactory cleft opacifications were significantly higher in the olfactory dysfunction group. In multivariate regression analysis, Lund-Mackay score (adjusted odds ratio 1.24, 95% confidence interval 1.02 to 1.54, $p=0.039$) and olfactory cleft opacifications (adjusted odds ratio 2.54, 95% confidence interval 1.46 to 5.00, $p=0.003$) remained significant predictors for symptomatic olfactory dysfunction. Elevated levels of immunoglobulin E in middle turbinate tissue were identified in the olfactory dysfunction group, while elevated levels of interleukin-17 and interferon- γ were observed in the asymptomatic group. **Conclusions** Considering phenotypes and endotypes of CRS, olfactory cleft opacification on CT imaging and Lund-Mackay CT scores remained the predominant indicating factors for symptoms of olfactory dysfunction. A negative correlation of olfactory dysfunction and tissue interleukin-17 and interferon- γ levels were additionally noted.

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Oncostatin M contributes to airway epithelial cell dysfunction in chronic rhinosinusitis with nasal polyps

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CRSwNP is a typical type-2 inflammation involving several cytokines and is associated with epithelial cell dysfunction. Oncostatin M (OSM) (belonging to the IL-6 family) could be a key driver of epithelial barrier dysfunction. We investigated the presence of OSM and IL-6 and the expression pattern of tight junctions (TJs) in the nasal tissue of CRSwNP patients and controls using RT-qPCR and Western blotting. Then, their potential role in the epithelial barrier was evaluated in vitro in 27 different primary cultures of human nasal epithelial cells (HNECs) by measuring TJ expression and transepithelial electric resistance (TEER) with or without OSM or IL-6 (1, 10, and 100 ng/ml). The effect on ciliary beating efficiency was evaluated by high-speed videomicroscopy and on repair mechanisms with a wound healing model with or without OSM. OSM and IL-6 were both overexpressed, and TJ (ZO-1 and occludin) expression was decreased in nasal polyps compared to control mucosa. OSM (100 ng/ml) but not IL-6 induced a significant decrease in TJ expression, TEER and ciliary beating efficiency in HNECs. After 24 hours, the wound repair rate was significantly higher in OSM-stimulated HNECs at 100 ng/ml. These results suggest that OSM could become a new target for monoclonal antibodies.

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Dupilumab counteracts IL-4 effects on airway epithelial cells explaining its efficacy in CRSwNP

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CRSwNP is a typical type-2 inflammation involving IL-4 and IL-13. Dupilumab is a fully human monoclonal antibody targetting IL-4R α , the shared receptor component for IL-4 and IL-13, thereby blocking signalling by both cytokines. We investigated in 25 different primary culture of human nasal epithelial cells (HNECs) at the air-liquid interface (ALI) in vitro the effect of IL-4 and IL-13 (1, 10, and 100 ng/ml) on transepithelial electric resistance (TEER), tight junctions (TJ) expression, ciliary beating efficiency and wound repair capacity, and iii) the effect of Dupilumab on IL-4 induced epithelial dysfunctions. The effect on ciliary beating efficiency was evaluated by high-speed videomicroscopy and on repair mechanisms with a wound healing model with or without IL-4 and Dupilumab. IL-4 (1 ng/ml) but not IL-13 induced a significant decrease in TEER counteracted by Dupilumab. IL-4 (1, 10 and 100ng/ml) but not IL-13 induced a significant decrease in ciliary beating efficiency in HNECs, counteracted by Dupilumab. After 24 hours, the wound repair rate was significantly lower in IL-4-stimulated HNECs at 100 ng/ml, counteracted by Dupilumab. These results suggest that Dupilumab is playing a direct role on epithelial cell functions such as ciliary beating efficiency and wound repair capacity, explaining its efficacy.



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Role of basal cells in nasal polyp epithelium in the pathophysiology of eosinophilic chronic rhinosinusitis (eCRS).

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Basal cell hyperplasia is commonly observed in nasal polyp epithelium of eCRS. However, the role of basal cells in the pathophysiology of eCRS is unknown. We found that normal human bronchial epithelial (NHBE) cells differentiate into basal cells when the cells were cultured in PneumaCult™-Ex Plus medium. Most of the 3rd passaged cells expressed basal cell surface marker CD49f/CD271 and nuclear marker p63, while NHBE cells cultured in BEGM™ did not express these basal cell markers. RNA sequencing revealed that cultured basal cells had higher gene expression of TSLP, IL-8, TLR3 and TLR4, and lower expression of PAR-2, compared to cultured NHBE cells. The mRNA expressions of TSLP, IL-8 and TLR3 were significantly increased in cultured basal cells and those of PAR-2 and IL-6 were significantly increased in cultured NHBE cells. Poly (I:C)-induced-TSLP production and LPS-induced IL-8 production were significantly increased in cultured basal cells compared to those in cultured NHBE cells. IL-4 and IL-13 stimulated the proliferation of cultured basal cell, but they did not stimulate the proliferation of cultured NHBE cells. These results indicate that basal cells were main source of TSLP and IL-8 in nasal epithelium, and basal cell hyperplasia was induced by IL-4 and IL-13 in nasal polyps of eCRS.



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Gene expression profiling in chronic rhinosinusitis with nasal polyps

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The pathogenesis of chronic rhinosinusitis with nasal polyposis remains unclear. RNA sequencing and comprehensive bioinformatics analysis allow to characterize the gene expression profiles, determine pathways and candidate gene sets associated with CRSwNP. We performed 3' messenger RNA sequencing on 6 polyp and 6 paired non-polyp lateral nasal wall mucosa tissue samples from patients with recurrent CRSwNP and 4 nasal mucosa samples from non-CRS controls. – Another 30 samples are being processed. We found 262 and 269 differentially expressed (DE) genes between nasal polyp tissue versus nasal mucosa of patients with CRSwNP and between nasal polyp tissue versus non-CRS controls, respectively. Our early results show that STATH and XKR4 were the most downregulated, while Charcot-Leyden crystal galectin (CLC) was one of the most upregulated genes in nasal polyp tissue in both comparisons. CLC plays a role in eosinophil granulogenesis, STATH encodes statherin, which has a suggested promoter effect in inflammation and nasal polyp formation. The role of XKR4 coding for a membrane protein involved in apoptosis is still unknown in CRSwNP.



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The Infra-Bullar Groove, A New Landmark to Unlock the Natural Maxillary Ostium

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introduction: Failure to open the natural maxillary ostium (NMO) is a common surgical mistakes during ESS, and results in recirculation and diseased maxillary sinus. To our knowledge no landmark that aid in locating the natural maxillary ostium have been described. We describe the infrabullar groove (IBG), a new landmark that will help the surgeon to correctly locate the natural maxillary ostium during ESS. The IBG is a groove in the lateral nasal wall immediately below the bulla ethmoidalis, and can be identified following uncinata process resection. The anterior most part of the groove ends in the natural maxillary ostium. **methods:** Following explanation about IBG concept and connection to NMO, clips of Maxillary Antrostomy (MA) in mild, moderate, and severe CRS were viewed separately by two ENT residents and the senior author. Each surgeon answered the following questions: can you identify an IBG? When did you first identify the IBG? Does the grove end in the natural maxillary ostium? **Results:** IBG was identified in all video clips by young as well as experienced physicians. The anterior part of the IBG ended at the NMO in all cases. **Conclusion:** The IBG is a new and easy to identify anatomical landmark that helps to locate the NMA. This may lower the incidence of recirculation and MA failure. To our knowledge, this landmark was not previously described in the literature.



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Sufficient middle meatal accessing using newly designed instrument: Bofares's middle meatal speculum (how I do it?)

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Abstract As it is well known that the most significant, interested and target area for surgeons during functional endoscopic sinus surgery (FESS) is the middle meatus. The most highlighted problem that may facing the surgeon who are approaching the endoscopic middle meatal surgery is the inability to get a sufficient surgical access into the middle meatus. This is most probably due to oversized middle turbinate or floppiness of middle turbinate that resulting in the obscuring of the field and frequent fogging of the lens due to recurrent touching of coming in route middle turbinate. Therefore, it become necessary to resolve this problem, which I am sure that interrupt the interest of most of the surgeons. For this reason, this tool was proposed and designed to retract the middle turbinate medially at its different three part (M1, M2, and M3) with accommodated heights and self-retained controlled with wide range adjustor to provide a sufficient access to this very important area. **Keywords:** Bofares middle meatal speculum, Middle meatal speculum.



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Comparing Medical Management to Surgical Intervention for Sinonasal Airway Anatomy and Function in a Case of Surgical Delay in Chronic Rhinosinusitis

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Objective: To investigate changes in sinonasal anatomy from delayed surgical intervention for treatment of CRS in an adult male patient who waited 6 years before undergoing FESS. **Methods:** CT scans of the patient were obtained at 3 time points: initial diagnosis (PRE1), 31 months after PRE1 (PRE2), and 46 months after PRE2 (POST; 6 months after FESS). Patient had bilateral disease and was under medical management from PRE1 to PRE2. Sinonasal airways were constructed from the CT scans and volume was quantified. Airflow simulations were performed at 15L/min in PRE1, PRE2, and POST; resistance values were calculated and compared with normative data (mean \pm standard deviation) from 12 healthy male subjects. **Results:** FESS decreased bilateral resistance (Pa.s/mL) to normative levels: PRE1=0.458, PRE2=0.230, POST=0.024, and Normal=0.036 \pm 0.020. PRE1-PRE2 reduction was 50% and 95% from PRE1-POST. On the less-diseased left side, PRE1-PRE2 nasal airway volume increased by 32% and PRE1-POST by 59%. The MS volume shrunk (16%) from PRE1-PRE2 and increased (8%) from PRE1-POST. From PRE1-PRE2, FS (9%) and ES (77%) volumes increased but the SS (14%) volume shrunk. From PRE1-POST, FS (48%), ES (715%), and SS (14%) volumes increased. On the more diseased right side, except the FS (20%) volume that increased from PRE1-PRE2, volume of other regions shrunk (nasal=4%, MS=7%, ES=33%, SS=20%). From PRE1-POST, the volume of every region increased (nasal=36%, MS=59%, FS=67%, ES=296%, SS=13%). **Conclusion:** FESS improved ventilation to the paranasal sinuses compared to medical management



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Isolated frontal sinus fungus ball - a rare case presentation and literature review

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Introduction: Fungus ball is a noninvasive form of fungal rhinosinusitis represented by the accumulation of fungal hyphae in the paranasal sinuses, mostly affecting a single maxillary sinus. Occasionally, the hyphae accumulation may appear in the sphenoid or other sinuses. **Materials and Methods used:** We performed a literature review on fungus ball in the paranasal sinuses and presented a case of a rare localization of fungus ball in the frontal sinus in an adult female. The frontal sinus is listed as the paranasal sinus most rarely affected by the fungus ball comprising only 2% of the cases. **Results:** Fungus balls appear mostly in females with a peak occurrence between 50 to 60 years of age. The prevalent etiological agent is *Aspergillus* spp with *Aspergillus fumigatus* and *Aspergillus flavus* being the main species involved. The maxillary sinus is the most frequent affected followed by the sphenoid, ethmoid, and, finally, the frontal sinus. The gold standard therapeutic approach is endonasal endoscopy in any affected paranasal sinus. **Conclusion:** The presence of a fungus ball in the frontal sinus despite its low incidence, should be considered in patients with pain in the frontal region who do not respond to the usual clinical treatments.

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Objective long-term volumetric results of surgical treatment maxillary sinus atelectasis in children

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Objectives: The aim of this study was to objectively investigate volume of the maxillary sinus in children with silent sinus syndrome using CT pre and postop. **Methods:** We prospectively studied 35 children (21 girls (60%) and 14 boys (40%)), age ranging from 5 to 17 years (mean age 10,9± 3,5 years). All children underwent endoscopic middle meatal antrostomy. The study was carried out on the multispiral computed tomograph Discovery CT 750 HD with 0,6 mm step. Data management and analytics was done using diagnostic software module Volume Viewer AW VolumeShare7. MSCT was done before and 6-8 months after surgery. We assessed the volume of the maxillary sinus pre and postop bilaterally and calculated the coefficient of sinus volume variation in time on affected (K1) and health side (K2). **Results:** The calculation was done in 31 children. Mean volume of affected sinus preop was 4,2 +/- 2,7 sm3, during 6 months after surgery – 5,5+/-3,5 sm3, p<0,001. Mean volume of health sinus preop was 11,0+/-6,11 sm3, postop – 12,8+/-5,8 sm3. The coefficient of variation for the affected side (K1) was 1,3+/-0,36, and for the health side (K2) - 1,08+/-0,17, p=0,003. **Conclusions:** CT measurement of the sinus volume is a valid method of evaluation of the surgery efficacy. Our data showed that endoscopic middle meatal antrostomy allowed to stop enophthalmos progression and enable the spontaneous increase of the sinus volume followed normal growth of child's facial skeleton.



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Orbital complications in ESS: first ESS vs reoperation

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Background Endoscopic Sinus Surgery (ESS) is an effective surgical technique. Complications after ESS are rare. Most common are orbital complications, which can vary in severity from minor, such as medial wall injuries, to major, such as optic nerve damage and blindness. The aim of the study was to review orbital complications after ESS in Institute of Physiology and Pathology of Hearing during 10-year period and comparison of the incidence and nature of complications during the first operations and reoperations. Methods A retrospective review was undertaken of all ESS in the last 10 years. The authors present the results of operative treatment. Results 5287 ESS were performed in our clinic – 4315 first ESS and 972 reoperations. Orbital complications were observed in 84 patients – 56 after first operation and 28 after reoperation. Most patients had mild complications, such as injuries to orbital lamina. Major complications were extremely rare - one patient was blinded, two patients have persistent vision disorder. Conclusion Orbital complications following ESS are rare but potentially dangerous events. The risk of complications correlates to anatomical variations, severity of inflammation, previous operation results and surgeon's experience. For the safety of operations, very good knowledge of anatomy, preoperative imaging, as well as the surgeon's experience and the ability to predict threats are necessary. During reoperation, due to the possible lack of anatomical reference points, the use of navigation is recommended.

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Surgery versus medical therapy in patients with CRSwNP – results from a multicentre randomised controlled trial

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Background: Endoscopic sinus surgery (ESS) is a common operation for patients with chronic rhinosinusitis with nasal polyps (CRSwNP), however there is no clinical knowledge from randomised trials about the benefit of surgery over medical therapy (MT). To overcome the evidence gap with respect to surgical management of patients with CRSwNP we performed a multicentre RCT to assess the efficacy of ESS+MT versus medical therapy (MT). **Methods:** This was an open-label, multicentre, pragmatic RCT. Adults (aged ≥ 18 years) with CRSwNP and an indication for ESS were randomly allocated to receive either ESS+MT or MT. The primary outcome was disease-specific health-related quality of life, measured with the Sinonasal Outcome Test 22 (SNOT-22) after 12 months follow-up. **Results:** Between February 2015 and September 2019, 238 participants were randomised, of which 214 participants could be analysed after 12 months. After 12 months follow-up the mean SNOT-22 score in the ESS+MT group was 27.9 (SD 20.2) and in the MT group was 31.1 (SD 20.4), with a mean difference of -4.9 points [95% CI -9.4; -0.4], favouring ESS+MT. Patients assigned to ESS+MT also scored significantly better than patients assigned to MT on general nasal symptoms, nasal polyp size, control of CRS and use of systemic corticosteroids. Adverse events were similar between the groups. **Conclusion:** ESS+MT is more efficacious than MT in adult patients with CRSwNP and reduces the need for systemic corticosteroids.



1474

Outcomes of endoscopic sinus surgery in patients of Central compartment atopic disease

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CRS – surgical management 1 | Room 10 Peroto - Level 0 | Monday 19/06/2023

Background: central compartment atopy disease (CCAD) is a subtype of chronic rhinosinusitis, which is characterized by polypoid change in the posterosuperior nasal septum, middle turbinate and superior turbinate. Endoscopic sinus surgery (ESS) outcomes in Chinese have not been report yet. The aim of this study was to evaluate the outcomes of patients with CCAD after ESS and compared with two following subtypes: chronic rhinosinusitis with nasal polyps (CRSwNP) and concomitant polypoid disease in the central compartment (CRSwNP/CC) and CRSwNP not otherwise specified (CRSwNP NOS).Methods: This prospective cohort study consecutively enrolled patients with bilateral CRSwNP. All of these patients underwent ESS and received regular postoperative medical treatment. The demographic data, symptom severity scores, and surgical outcomes at 1 year after surgery were collected.Results: Our study included 84 patients (CCAD=27, CRSwNP/CC=31, CRSwNP NOS=26). 92.31% of patients (24/26) in the CCAD group achieved a controlled status one year after surgery, compared with 70.00% (21/30) in CRSwNP/CC group and 96.00% (24/25) CRSwNP NOS group. Conclusion: Most of CCAD patients achieve controlled status at 1 year after surgery.



1496

Indications for surgery in rhinosinusitis in South Africa

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CRS – surgical management 1 | Room 10 Peroto - Level 0 | Monday 19/06/2023

Indications for sinus surgery are described in many publications and guidelines. These guidelines are mostly written by physicians in high income countries and are based on research undertaken in such countries. Africa has mostly low and lower middle income countries which leads to unique challenges in sinus surgery. Therefore indications for surgery need to be modified compared to affluent countries. Examples of challenges include the ability of patients in remote areas to present themselves for regular follow ups, traditional beliefs of patients and their families and, difficulties in obtaining certain medicines in financially constrained circumstances. We will summarise indications for different types of surgery from guidelines including EPOS and point out which indications need to be modified due to the specific differences in health services between affluent countries and low and lower middle income countries. We base this on a consensus statement to be published by the South African Allergic Rhinitis Working Group which deals amongst others with sinus surgery. A review of relevant literature mainly from African authors will be presented.



1501

Introducing Functional Endoscopic Sinus Surgery assisted by navigation system at Medical University – Pleven: learning curve and current results in the management of chronic rhinosinusitis

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CRS – surgical management 1 | Room 10 Peroto - Level 0 | Monday 19/06/2023

Functional Endoscopic Sinus Surgery (FESS), with opportunities for simulation and navigation, is considered a gold standard for treating chronic rhinosinusitis with nasal polyps. Despite the efficacy of endoscopic sinus surgery when medical therapy is insufficient, using FESS remains a challenge for young surgeons and requires precise planning with in-depth consideration of disorder severity, anatomical variability, co-medication and co-pathology. Optimizing team learning curves with skill development and FESS experience is crucial for successful outcomes. We aim to evaluate the current results from introducing FESS ± navigation (FESSn / FESS) in the minimally invasive surgical treatment of patients with chronic rhinologic pathology within the project BG05M2OP001-1.002-0010-C01, compare the outcomes and follow up the development of the surgeon's learning curve. The FESS was performed in the Operating Unit with Navigation Systems at the Center of Competence of Medical University – Pleven. The FESS was performed in the Operating Unit with Navigation Systems at the Center of Competence of Medical University – Pleven. We used FESSn in 54% of patients and conventional surgery in 23%. The mean operative time was 1.17 h (SD 0.37), and the mean blood loss was 124.10 ml (SD 37.61). During the follow-up, the local control was good and there was no recurrence in 76 % of patients. Our study results support the importance of precisely analyzing the indications for FESS, planning navigation assistance and improving the surgeon's FESS experience for optimizing the clinical outcome.

1520

The impact of follow-up adherence and medication adherence on the control rate of chronic rhinosinusitis after endoscopic sinus surgery

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CRS – surgical management 1 | Room 10 Peroto - Level 0 | Monday 19/06/2023

Background : To explore the effect of follow-up or medication adherence after endoscopic sinus surgery (ESS) on the control status of chronic rhinosinusitis (CRS).

Methods : A retrospective review of 226 patients with chronic rhinosinusitis under ESS in two clinical centers during 2018 to 2021 was conducted. Clinical characteristics including smoking, asthma, allergic rhinitis, sinus surgery history, endoscopic and CT scores, blood eosinophils number and percentage and serum total IgE were collected. Follow-up of symptoms which contained visual analogue scales, total nasal symptom score (TNSS), and sinonasal-outcome test 22 (SNOT-22) score, and assessment of endoscopic score and control status of CRS at the first and the 12th month after ESS were conducted.

Results : Patients with both good follow-up adherence and good medication adherence had the highest control rate (71.2%), the second higher rate was in patients with good follow-up adherence but poor medication adherence (42.1%) more than patients with good medication adherence but poor follow-up adherence (22.7%) and patients with poor follow-up adherence and poor medication adherence (5.1%). ($P < 0.0001$) All VAS, TNSS, SNOT-22, E-score% were different especially at the 12th month after ESS (all $P < 0.0001$) in the trend in the accord with the controlled rate above. Baseline characteristics did not influence the control status. **Conclusions:** Follow-up adherence and medication adherence had a great impact on the control status of CRS after ESS.



Paediatric rhinology 1

1179

Choanal polyps in children and adults: 10-year experience from a tertiary care hospital

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Paediatric rhinology 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Purpose: Choanal polyps (CPs) are benign, solitary, soft tissue lesions extending towards the junction between the nasal cavity and the nasopharynx through the choana. The aim of this retrospective study was to evaluate clinical and histological characteristics of CPs in children comparing to adult patients. Methods: Characteristics of CPs treated in our hospital (demography, main complaints, side, localization, surgical approach, histological characteristics, accompanying sinus disease, association with allergic rhinitis, postoperative follow-up period, recurrence rates) were retrospectively reviewed. Results: Seventy-eight patients with CPs were included, 22 (28%) patients in children and 56 (72%) in adults. In 27% children and in 7% adults we found the oropharyngeal extension of CPs ($p < 0.01$). In 18% children and in 5.3% adults, we found the histological characteristics of an angiomatous CP ($p < 0.05$). The association with allergic rhinitis was more frequent in children (32%) than in adults (18%) ($p < 0.05$). In 32% pediatric patients and in 14% adults, we found the association with ipsilateral chronic maxillary sinusitis ($p < 0.05$). After the surgical treatment, we found the recurrence in 3 (14%) pediatric and in 5 (8%) adult patients, without the significant difference. Conclusion: Our results suggest some specificities of CPs in children comparing to adults. Oropharyngeal extension, association with allergic rhinitis and ipsilateral maxillary sinusitis, and the presence of angiomatous histological type of CPs are more frequent in the pediatric population.



1248

Sinonasal Primitive Myxoid Mesenchymal Tumor of Infancy: Immunohistochemistry and Surgical Treatment

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Paediatric rhinology 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Objective: Primitive myxoid mesenchymal tumor of infancy (PMMTI) is a rare recently described myofibroblastic tumor with intermediate aggressiveness, high recurrence, rare metastasis and poor response to chemotherapy. We purpose to present the second reported case of Sinonasal PMMTI, occurring in a 3-year old child, its surgical treatment and to provide and briefly review how can the immunohistochemical phenotype can target the treatment and the surveillance. **Material and Methods:** Clinical examination, medical imaging and immunohistochemical stains and cytogenetic analysis were checked. We also briefly review the relevant literature about PMMTI and closely associated diagnoses. **Results:** Identification of BCOR immunoreactivity in the preoperative biopsy evaluation made the diagnosis of PMMTI and help to differentiate it from closely associated diagnoses, congenital infantile fibrosarcoma and infantile fibromatosis. Unlike those, this tumor is unresponsive to chemotherapy, making the gold standard of treatment radical surgical excision with establishment of negative margins. Complete excision with medial maxillectomy using Rouge Denker approach was undertaken as definitive management. **Conclusion:** As Immunocytochemistry advances, the diagnostic capabilities are becoming even more precise. Such is the case of PMMTI, which its target treatment is the surgical excision. This reminds the close collaboration needed between the pathologist and the surgeon, especially when dealing with such a rare case.



1265

Acute invasive fungal rhinosinusitis in pediatric age group

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Paediatric rhinology 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Invasive fungal Rhinosinusitis in Pediatric Patients with Acute Leukemia Hussam Elbosraty, MD, Prof. of ORL, Kasr Al-Aini Hospital, Cairo University. Consultant ORL, Pediatric Cancer Hospital, Cairo, Egypt. Invasive fungal sinusitis is becoming increasingly common immunocompromised patients. We conduct this study on 70 children with acute leukemia treated with bone marrow transplant. Incidence, clinical presentation, diagnosis, TTT and outcome were evaluated. 70 children (46 female, 24 male), age range 2 to 19 years, 5 cases developed acute invasive fungal sinusitis. Presenting symptoms were fever, facial pain, headache, nasal congestion and orbital swelling. Histological examination of the debrided tissues revealed Mucor species in 4 cases and aspergillus in one case. Although that IFS has generally poor prognosis, yet, It appeared that the response to therapy in these category of patients is excellent provided early intervention with extensive debridement & medical therapy in the form of Liposomal amphotericin, granulocyte transfusions and special consideration of the general health and underlying factors of immune-suppression.



1308

Nasal Trauma in Child. Potential Consequences in Adulthood

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Paediatric rhinology 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Aim: To prevent and to treat nasal trauma in children properly, because it can lead to displacement or depression of the nasal bones or septum. Second, our aim was, for the patient to recognise and create a mature decision for eventual nose changes which will be made with the operative intervention or they are not mature enough and the decisions were made by their parents.

Material and Methods: Our retrospective study was made at University Clinic for Ear, Nose and Throat, Faculty of Medicine, Ss Cyril and Methodius University of Skopje in the period of 10 years (2010-2023). Seventy-three patients were admitted with recent or previous nasal trauma or nasal deformity. The first group of 32 were children and adolescents from 6-14 years old who were admitted to our hospital because of recent nasal trauma. The second group of 41 children and adolescents from 6-14 years old were admitted to our hospital because of previous nasal trauma, which was not treated on time, or it was not treated properly. They were admitted to our clinic for surgical intervention septo/rhinoplasty. The second group of patients fills the brief psychological questioner prepared by Clinical psychiatrist from University Clinic of Psychiatry, in Skopje, and their psychological reactions were taken into consideration.

Results: Eleven of the children and adolescents who had nasal fracture without dislocation, who have no symptoms, minimal swelling, and no septal deviation or hematoma, were observed with a specific follow-up: 3 days after nasal fracture, then every week in the first month, after 1 month, and after 3 months period. Sixteen of children and adolescents who had a nasal fracture with subluxation of nasal septum were operated with closed reduction (repositio nasi) under general anaesthesia. The others with septal hematomas and subperichondrial abscess were treated as in adults' patients. The second group of 41 children and adolescents from 6-14 years old consisted with the previous nasal trauma which was not treated on time or it was improperly treated. In 24 (58.54%) of these patients septoplasty was performed and in 17 (41.46%) was performed rhino septoplasty.

Conclusion: Often, difficult septal deformations in children are followed with deformation of the nasal pyramid (rhino scoliosis, rhino lordosis). In those cases, we cannot solve septal pathology without nasal pyramid intervention in the same time and opposite. Clinical reports have not produced solid evidence for the statement that septal surgery has no negative effect on nasal growth or can serve for correcting abnormal growth. The functional and esthetic problems of the patient, however, mean a continuous stimulus for further clinical and experimental investigations.



1381

Pediatric Nasal Polyposis : Case series from a single institution and literature review

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Paediatric rhinology 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Nasal polyps are benign inflammatory masses potentially arising from any portion of the mucosa of the nose and paranasal sinuses, causing chronic nasal obstruction. Nasal polyposis of pediatric patients can be an important signal for systemic disorders immunodeficiencies and specific allergies. Nasal polyps are mostly represented with cystic fibrosis. In this case series we aim to report 11 different pediatric cases which were admitted to our pediatric ENT department and were operated with endoscopic sinus surgery in 5 years period. We will share our treatment outcome after surgical management. We will also discuss the pathogenesis and management of nasal polyposis in the children with different therapeutic approaches from recent data with review of rhinologic literature.

1403

Rhinoseptoplasty in adolescents

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Paediatric rhinology 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Surgical intervention in external nasal structures under 18 years old was tabooed for a long time, and still avoided in the pediatric patients out of concerns surrounding the potential disruption of nasal growth centers. To date, there is still no consensus for the indications and age limitations for septorhinoplasty under 18 years of age. The aims of the study was to assess safety and efficacy, psychological impact, long-term outcomes and to define preferable surgical strategy and technique of septorhinoplasty in adolescent patients. Materials and methods used: 31 patients (19 girls, 12 boys) with polyetiological deformities of nasal structures, among them crooked and saddle nose deformity, associated with severe nasal obstruction, underwent open-approach functional septorhinoplasty with simultaneous turbinoplasty, 5 of them with autologous rib cartilage graft. Mean age of patients was 16.7 years, range from 11 to 17 years. For evaluation of nasal breathing we used Standardized Cosmesis and Health Nasal Outcomes Survey (SCHNOS) before and after 6 month of surgery. Results: There was a statistically significant decrease from pre-operative to post-operative score of SCHNOS. Mean score before surgery was 58.6 ± 15.7 points, and after 6 month of surgery it was 8.7 ± 3.8 points. There were only 2 (6.4%) cases of postoperative complications – septal hematoma and nasal synechia. Conclusion: Open-approach septorhinoplasty can be safely regarded as a preferable surgical strategy in teen patients with deformities of external nasal structures and nasal obstruction.



1449

Septoplasty in children – when and why?

Hristo Zlatanov, Anastasiya Korkova

Paediatric rhinology 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Opinions of ENT surgeons differ considering the need for correction of a deviated septum in pediatric cases. While some otolaryngologists maintain the opinion that surgery before the completion of nasal growth may lead to facial asymmetry, others claim that the impaired nasal breathing itself results in disruption of maxillofacial growth. Our convictions stand with the last. We believe that septal deviation causes sleep disturbances and is frequently a reason for recurrent sinusitis in children. In addition, constant oral breathing causes facial deformities and dental abnormalities. Also, some etiologic factors such as septal abscess, septal hematoma and nasal malignancies impose a septoplasty regardless of the age. Since guidelines on pediatric septoplasty are lacking, it is a matter of the surgeon's own assessment and experience to manage the deviated septum in children. We are sharing our view on the indications and timing for pediatric septoplasty.

1470

ENT PATHOLOGY FEATURES IN CHILDREN WITH AUTOIMMUNE RHEUMATOID DISEASES TREATED BY DMARDs

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Paediatric rhinology 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Objectives/Hypothesis: Autoimmune rheumatic-related diseases (ARRDs) have impact on patients, including their ENT field. DMARDs led to a breakthrough in the treatment of ARRDs in children. But in such children, increase in upper respiratory tract and ear acute and chronic diseases was seen. **Methods:** 100 children with ARRDs were examined in ENT department before treating by DMARDs and after 3 months. The mean age - 10 ± 4 years, of which 54 (54%) were men and 46 were women (46%). **Results:** It was revealed that 43 (43%) children had ENT pathology before treatment by DMARDs. 67 (67%) children had ENT pathology after treatment by DMARDs. Adenotonsillar hypertrophy was in 15 cases before and 26 after DMARDs, recurrent tonsillopharyngitis – 10 and 15, chronic sinusitis – 6 and 7, chronic otitis – 4 before and after, middle otitis with effusion – 8 and 15 respectively. **Conclusions:** DMARDs increase risk of developing ENT pathology in children, which requires the mandatory ENT specialist participation in observation and treatment of such children.



1499

Choanal atresia- surgical approach without stent placement procedure, based on anatomical particularities

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Paediatric rhinology 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Introduction: Choanal atresia is a life-threatening congenital malformation. It is characterized by impaired communication between the nasal cavity and the pharynx. The obstruction can be unilateral or bilateral, as well as membranous, bony or combined. The diagnosis of bilateral choanal is recognized clinically immediately after birth due to respiratory distress syndrome. Confirmation is carried out by endoscopy of the lower nasal passage and choanae, and computed tomography. **Aim:** to demonstrate the peculiarities in the anatomy of choanal atresia and our experience in surgical treatment without stent placement. **Material and methods:** Our prospective clinical study included 14 cases with choanal atresia aged 0 days to 6 years. The distribution by gender male:female is 8:6. All patients underwent endoscopy of nasal cavity and computed tomography with measurement of the thickness of the vomer and the width of both nasal cavities. **Results:** Stents were placed in three patients and revision surgery was necessary in six of the cases due to narrowing and adhesions in the region of the neochoana. We did endonasal endoscopic fenestration with resection of posterior part of the nasal septum. **Conclusion:** In the clinical study, we found a correlation between thickening of the posterior end of the septum and its resection, and the need for stent placement. Patients have a significantly shorter postoperative period without the complications of a stent placement procedure.



1540

PEDIATRIC NASAL DERMIDS: EXPERIENCE OF 9 CASES

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Paediatric rhinology 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Nasal dermoid are uncommon midline congenital lesions in the nose that can present clinically as a cyst, sinus or fistula. Treatment consists in surgical excision. Pre-operative imaging is mandatory to evaluate local and intracranial extension. We present 9 children with nasal dermoids (five females) operated at the mean age of three years (11 months – 7 years) between 2015 and 2023. Pre-operative imaging (CT or MRI) revealed extension of the cyst to the foramen cecum in 3 cases, none with intracranial extension. Clinical presentation was a dermoid sinus-cyst in seven cases and a cystic lesion in two. Lesion location was on the nasal dorsum (five cases), glabella (two cases) and between the midline and medial canthus (two cases). A dorsal rhinotomy was used as surgical approach and the endoscope was used in three cases to allow better in-depth visualization for a complete excision. Reconstruction of the defect with autologous material (fascia lata, conchal cartilage, fat) was performed in three cases, one of them with an open rhinoplasty approach. No complications or recurrence occurred during follow-up (mean of 26 months). Careful pre-operative surgical planning is mandatory in nasal dermoid surgery, to ensure minimal recurrence rates and the best aesthetic results.



1676

Predictive Factors for Severe Orbital Infections in Children: A 10-Year Hospital-based Study

Rabia Shihada, Majd Khoury

Paediatric rhinology 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Objectives: To characterize the clinical features of hospitalized pediatric patients with pre- and post-septal cellulitis and studying factors associated with a more advanced and complicated disease. **Patients and methods:** This is a retrospective study of all children with pre- and post-septal cellulitis who were admitted to our hospital in the last 10 years. **Results:** A total of 84 cases were included with median age of 4.72 years. 30.95% patients had post-septal cellulitis. Sinusitis (P



CRS – outcome assessment 1

1279

Can Serum IgE or Blood Eosinophil Count Predict Postoperative Oral Corticosteroid Response in CRSwNP?

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CRS – outcome assessment 1 | Room 12 Hall 40 - Level 6 | Monday 19/06/2023

OBJECTIVE: The primary objective was to evaluate the outcomes of postoperative oral corticosteroid (OCS) in treating patients with CRSwNP. The secondary objective was to determine whether preoperative serum IgE (sIgE) and/or blood eosinophil count (BEC) correlate with postoperative patient reported outcomes after OCS use.

METHODS: Patients with bilateral CRSwNP (n=236) who underwent endoscopic sinus surgery (ESS) were randomly assigned to receive 15 mg OCS twice daily or a placebo for 2 weeks. We investigated the treatment effects on the basis of visual analog scale (VAS), Sino-Nasal Outcome Test 22 (SNOT-22), and Lund-Kennedy Endoscopy Score (LKES) over 6 months, and subgroups were stratified preoperatively as follows: sIgE <0 IU/mL, sIgE ≥150 IU/mL, BEC <0.39×10⁹ cells/L, and BEC ≥0.39×10⁹ cells/L. **RESULTS:** A total of 193 participants completed the study up to 6-month follow-up; no apparent linear relationship was noted between sIgE and BEC (r²=0.015, p=0.091). No significant differences in scores were noted upon assessment of the VAS, SNOT-22, and LKES among the follow-up timepoints in the primary analysis. However, in the primary or subgroup analysis with sIgE or BEC, significant differences in the longitudinal scores of sleep dysfunction were observed between at the 1-month follow-up. **CONCLUSIONS:** Postoperative OCS did not significantly affect CRSwNP outcomes. sIgE and BEC may not be surrogate predictive biomarkers to assess the role of postoperative OCS use. OCS may increase the risk of transient sleep disturbance.



1328

The Long-Term Implications of Rhinitis and Chronic Rhinosinusitis In Young Adults

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CRS – outcome assessment 1 | Room 12 Hall 40 - Level 6 | Monday 19/06/2023

Background: The long-term impact of rhinitis and CRS on general health and medical services utilization in young adults have been limitedly studied.

Methods: A case control study in the Israeli Defense Forces, between the years 2005-2019, of all individuals with either rhinitis or CRS and a matched cohort of healthy individuals with at least five years of follow-up. **Results:** The study groups included 617 patients with rhinitis and 296 patients with CRS and 2,739 healthy controls with an average age of 28 years. During a mean follow up of 8 years, a significant fraction of patients in both study groups were diagnosed with asthma compared to the control group, (26.1% and 23.3% vs 3.7%, respectively; CI 95%: 12.1%-14.9%, $p < 0.0001$). Significantly increased loss of productivity and medical system utilization were noted in the study groups compared to controls ($p < 0.0001$). Moreover, deterioration in general health, manifested as loss of physical fitness for combative service was observed in a third of patients during follow up.

Conclusions: Rhinitis and CRS significantly impact productivity and medical service utilization in young adults, as well as general health associated with development of asthma and impairment of physical fitness. A minority of rhinitis patients develop CRS overtime, further affecting this patient group.

1369

THE ROLE OF BODY MASS INDEX AS A PREDICTOR OF DUPILUMAB EFFICACY IN PATIENTS WITH SEVERE UNCONTROLLED CRSwNP.

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CRS – outcome assessment 1 | Room 12 Hall 40 - Level 6 | Monday 19/06/2023

Purpose: Our study focuses on the efficacy of dupilumab for chronic rhinosinusitis with nasal polyps. In particular, we evaluated the impact of the body mass index on therapeutic responses and we investigated both how obesity is related to increased grades of systemic inflammation and how a higher BMI could influence the outcomes of the treatment. **Methods:** In this study, designed as a real-life observational multicentric retrospective study, we reviewed medical charts of 106 suffering from CRSwNP treated with dupilumab. **Results:** Dupilumab has shown its efficacy in all measured outcomes. According to EPOS 2020 and De Corso et al. criteria of efficacy and response to dupilumab, three different types of response were identified: very early responder, early responder and late responder. In our sample and for the three different metabolic subgroups, a late response in term of NPS decrease, was observed only in three patients, all belonging to the obese group. A statistically significant difference was also found in SNOT-22 score decrease at V6 and V12 with higher score in overweight/obese patients (respectively $p=.018$ and $.020$). **Conclusion:** Our study confirmed the efficacy of dupilumab for treatment of CRSwNP in normal, overweight and obese patients. However, this efficacy seems to be affected in the timing of response by the patient's metabolic state. Our findings suggest that patients with a compromised metabolic state have a more impaired baseline and present a delayed response to dupilumab than normal-weight patients.



1387

POST ESS CARE: HOW TO MAXIMIZE OUTCOME

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CRS – outcome assessment 1 | Room 12 Hall 40 - Level 6 | Monday 19/06/2023

Background: Postoperative care is recommended by international leaders as an important part of the patient's medical management for Chronic RhonoSinusitis (CRS). This presentation highlights the main steps that ENT surgeons described in the post-operative care for patients after Endoscopic Sinus Surgery (ESS). In addition, it summarizes all recommendations in the literature. The presenter will give a summary at the end of the presentation and speak about own experience.

Objectives: This presentation will give a guide to the latest in the literature about post-ESS care. Recommendations from this presentation are applicable to all ENT surgeons at all levels who are practicing sinonasal surgeries.

RESULTS & CONCLUSION: There is a strong evidence that certain postoperative care after ESS positively impacts the outcome of surgery. ESS success and recurrence rate is multifactorial & postoperative care is just one aspect of CRS management dilemma. Care must start preoperatively and continues intra- and postoperatively. There is a strong evidence to support the use of saline nasal irrigation and some evidence to support topical & systemic steroids post ESS. On the other hand, sinonasal debridement, nasal packing, stenting, systemic and topical antibiotics are debatable in the postoperative care of ESS. In conclusion, optimum post-operative care does not replace bad surgery.

1388

Rate of Recurrence of nasal polyps after endoscopic sinus surgery & associated risk factors.

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CRS – outcome assessment 1 | Room 12 Hall 40 - Level 6 | Monday 19/06/2023

Background and objectives: Chronic rhinosinusitis constitutes one of the commonest conditions encountered in medical practice. Approximately 20% of cases of chronic rhinosinusitis are associated with nasal polyps. The aim of this study is to identify the recurrence rate of sinonasal polyps after endoscopic sinus surgery in Saudi Arabia and to evaluate the associated risk factors. **Materials and**

Methods: A retrospective study was conducted at the otolaryngology department of Dammam Medical Complex in Saudi Arabia. The records of patients who underwent endoscopic sinus surgery during 4-year period were reviewed. Data were entered into a standard spreadsheet program (Microsoft Excel) and were analyzed using SPSS software version. The study was approved by the local scientific committee.

Results: One hundred and eight adult patients (66 males and 42 females, mean age 34+/-13.78 years) were included. The most common presenting symptom was nasal obstruction (100 patients, 92.6%). Sixty-two-patients (57.4%) had coexisting allergic rhinitis, 46 (42.6%) were asthmatics, and 43 patients (40.18%) had extensive initial disease as measured by CT scan scores. Recurrence of nasal polyps was observed in 48 patients (44.4%) and was significantly associated with the presence of allergic rhinitis, bronchial asthma, and with the initial extent of disease. **Conclusion:** Recurrence rate of nasal polyps after endoscopic sinus surgery is high and challenging. Coexisting allergic rhinitis and/or bronchial asthma as well as the initial extent of disease are significant risk factors for recurrence.



1396

Prediction of olfactory function recovery in CRSwNP treated with dupilumab

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CRS – outcome assessment 1 | Room 12 Hall 40 - Level 6 | Monday 19/06/2023

Background: There is no known predictor for olfactory function recovery with dupilumab treatment in chronic rhinosinusitis with nasal polyps (CRSwNP). This study assessed whether subjective recovery of olfactory function on oral corticosteroids (OCS) is a prognostic factor. **Methods:** Retrospectively, 220 CRSwNP patients treated with dupilumab were divided into two groups depending on whether they had improvement of smell during OCS treatment before treatment with dupilumab (improved (OCS+) n = 152, not improved (OCS-) n = 68). Olfactory function was tested with sniffin' sticks (12 pens) at baseline, 1, 3 and 6 months of dupilumab treatment. **Results:** At baseline, both groups had a mean (SD = 2) and median score (IQR = 1.5) of 3 / 12 (anosmia). The OCS+ group showed significantly higher olfactory scores, mean 7.2 (SD 2.9) vs 4.8 (SD 2.3) at 1 month ($P < 0.001$), and mean 7.6 (SD 2.7) vs 4.6 (SD 2.8) at 3 months ($P < 0.001$). After 6 months, 27.6% of the OCS+ group was anosmic compared to 69.1% in the OCS- group. **Conclusion:** Patients who report olfactory function improvement on OCS have a higher chance of recovery of olfactory function during the first six months of treatment with dupilumab.



1475

Development of a standardized assessment of patient reported outcome measures following endoscopic sinus surgery for chronic rhinosinusitis: A qualitative study.

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CRS – outcome assessment 1 | Room 12 Hall 40 - Level 6 | Monday 19/06/2023

Background: Quality of life (QOL) outcomes following endoscopic sinus surgery (ESS) have been reported, yet few outcome measures have been developed through direct patient participation. Harmonizing patient reported outcome measures (PROM), observer based, and other evaluation techniques is paramount to enable the Otolaryngologist to produce clinically meaningful assessments. This study aimed to create a clinical instrument from PROMs to assess patients after treatment of chronic rhinosinusitis (CRS) with ESS.

Methods: This four-phase qualitative study employed grounded theory methodology and a modified Delphi technique. In Phase I, 15 patients were interviewed using open-ended questioning for identification of QOL domains impacted by CRS. Domains were presented in phase II to a focus group of new CRS patients who ranked each by order of importance. A conceptual framework of QOL domains impacted by CRS was created based on patient consensus and a focus group of Otolaryngologists itemized the PROM questionnaire in phase III. The questionnaire was completed by cognitive interviewing of new CRS patients in Phase IV.

Results: Patients identified 15 domains of QOL occupying three sub-scales: physical symptoms, psychosocial symptoms, and activity restriction. These domains provided the basis for the creation of a 19-item PROM questionnaire. **Conclusion:** Clinical application of the novel questionnaire produced by this study yields objective assessment of patient reported effectiveness of ESS for management of CRS. Further study will aim to validate this newly developed technique.



1505

Evaluation of the contributing factors associated with the clinical CRS control after endoscopic sinus surgery.

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CRS – outcome assessment 1 | Room 12 Hall 40 - Level 6 | Monday 19/06/2023

Background: Endoscopic sinus surgery (ESS) is a widely used surgical intervention for treating chronic sinusitis, however, a significant number of patients continued the persistent symptoms after adequate treatment by guidelines. This study is aimed to identify factors related to clinically uncontrolled patients who underwent endoscopic sinus surgery. Methods: A retrospective study was planned for patients who underwent endoscopic sinus surgery and followed up for at least 6 months. Patients were divided into three groups (controlled, partly controlled, and uncontrolled) according to EPOS 2020 criteria. Medical history and clinical factors were collected and analyzed the statistical differences in each group. Results: 267 patients were enrolled in this study. The controlled group was 35.2% (n=94), the partly control group was 52.1% (n=139), and the uncontrolled group was 12.7% (n=34). There was a statistically significant difference in the Lund-Kennedy score between the controlled and partially controlled groups ($p=0.45$) and a statistically significant difference in the Lund-Mackay score between the controlled and uncontrolled groups ($p=0.033$). Bilateral disease was a factor with statistical significance between groups ($p=0.002$). Gender, age, CMS phenotype, BMI, presence of diabetes or asthma, alcohol or smoking history, and past medical history of previous treatment did not show statistically significant differences in each group. Conclusion: These results suggest the predicting factors in uncontrolled patients after endoscopic sinus surgery.



Septal and turbinate surgery 1

1241

Endonasal approach to extracorporeal septal surgery: our experience

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Septal and Turbinate surgery 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Objectives Severe septal deviation has a negative impact on patients' life and cannot usually be repaired with classical septoplasty techniques, as the surgical repair is challenging. In our practice we utilise an endonasal approach extracorporeal septal surgery technique to tackle this problem.

Methods Retrospective data collection was conducted for cases of endonasal extracorporeal septal surgery in the last three years. Outcomes assessed included nasal airway, aesthetic nasal appearance, early and late complications and revision surgery.

Results Twenty patients had endonasal extracorporeal septal surgery. The follow-up was on average 5.3 weeks. The post-operative nasal airway was patent and not documented in 15 and 12 patients respectively. The aesthetic outcome was good in 12 and 7 cases respectively. One patient was displeased with their nasal appearance. The septum had residual deformity in one patient. Five patients had early complications, including minor epistaxis, inflammation and rhinorrhoea. Two patients had late complications (residual septal deviation, tip nose numbness). No-one from the patients had revision surgery.

Conclusion Endonasal approach extracorporeal septal surgery is a safe and effective technique. It has good functional and aesthetic outcomes, irrespective of extreme nasal deviations, with small number of complications. More robust data would be helpful for further evaluation of this surgical approach.



1407

Plastic closure of postoperative and recurrent nasal septal perforations using L-strut overlay flap

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Septal and Turbinate surgery 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Introduction. There is no conventional technique for iatrogenic and recurrent nasal septal perforations. We present a new technique for closing postoperative defects, based on the elevation of a vascularized flap from the L-strut area and the creation of the bed site without dissection of the surrounding septum. **Operation process.** We determine the level of previous cartilage resection and mark it. We make a lower horizontal incision along the marked line with a scalpel, repeating L-shape in anterior sections, from the level of attachment of the middle turbinate to the nasal cavity bottom. The second incision goes parallel to the first. Two incisions are connected in the region of anterior nasal spine. Mucoperichondrial flap is elevated. It receives blood supply from the branches of posterior nasal, anterior and posterior ethmoidal arteries. We perform scarification of the septum at the site of future recipient bed together with perforation edges de-epithelization. The fixation is performed with transseptal sutures. **Advantages.** The operation is performed with minimal trauma to mucous membrane (mucoperichondria dissection is not required); a septal flap with abundant blood supply is used to close the defect; the flap is covered with natural respiratory nasal epithelium, which restores nasal physiology.

1410

Proposal for a new classification of septal areas

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1688

Management of patients with chronic hypertrophic rhinitis 10 years retrospective study in ENT clinic of Timisoara

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Introduction:Nasal obstruction due to chronic hypertrophic rhinitis is increasingly common symptom encountered in rhinology. Even if it is not life-threatening, the disease has a major impact on the patient's physical, social, and psychological well-being. **Materials and Methods:**Our retrospective study included 2220 patient files, aged 16 to 82 years, admitted to the ENT Clinic with chronic hypertrophic rhinitis over a 10-year period. The following parameters were evaluated: gender, age, provenience, associated comorbidities and particularly, the treatment method and outcome. **Results:**Average age of the patients were 45 years, the male gender predominating, the majority being from urban living environment in 69.6%. The most representative clinical signs and symptoms according to this study are difficult nasal breathing and mouth breathing. The results of the study prove the effectiveness of the treatment wedged between septoplasty and electrocautery of inferior nasal turbinates. **Conclusions:** Chronic hypertrophic rhinitis is most commonly noted in patients with a long-standing septal deviation. Our priority as ENT specialists is to increase the quality of life of our patients.



1691

Patient satisfaction with septal buttons – a UK district general hospital experience

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Septal and Turbinate surgery 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Background Nasal septal perforations can present with symptoms such as: whistling, crusting, epistaxis and nasal blockage and adversely affect patients' quality of life. A septal button can reduce these symptoms. This study aims to establish the impact of septal buttons on nasal symptoms. Methods A retrospective search of theatre records at our district general hospital was carried out to reveal the total number of patients who underwent an insertion of a septal button between 2017 and 2023. These patients were contacted and asked to complete questionnaires evaluating current nasal symptoms (Sinonasal Outcome Test – SNOT 22) and comment on overall satisfaction. Results 40 patients had septal buttons inserted for perforations in this period but not all completed pre-and post-operative SNOT-22 questionnaires. No intra-operative complications were encountered. 90% were performed under general anaesthetic. Average operating time was 14.5 minutes. Patient satisfaction overall was high and for all patients with complete data set, there was improvement in nasal symptoms with an average reduction of 11 points on SNOT 22 scores. Conclusion Septal buttons represent a simple and effective option for the management of septal perforations. In this cohort, patients were satisfied with septal buttons and had improved nasal symptoms.

1698

Adipose stromal vascular fraction for nasal septal perforation closure: experimental evidence

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Septal and Turbinate surgery 1 | Room 8 Hall 4 – Level 0 | Monday 19/06/2023

One of the common problems that impairs the patient's quality of life is the perforation of the nasal septum. Among the population, the incidence of this pathology reaches 2.05%. Despite significant advances in surgical closure of septal perforation, the recurrence rate remains high. Therefore, there is an increasing interest in the regenerative medicine approaches and materials. Adipose stromal vascular fraction (SVF) is of particular interest due to the combination of 4 types of mesenchymal stem cells, including stromal, endothelial, hematopoietic and pericytic lineages. To evaluate the advances and limitations of this material for septal perforation closure, we performed an experimental study in rabbits. Under endoscopic control, an acute perforation of the cartilaginous nasal septum was created using cold instruments. After that, the defect was closed using collagen scaffold soaked in SVF. During the follow-up, endoscopy was performed 1 and 3 months after the procedure to evaluate the closure rate. In case of total perforation closure, histological examination of the regenerated tissue performed. The microscopy revealed the restoration both cartilaginous and mucosal layers of the septum in cases treated with SVF. Thus, SVF seems promising as a possible alternative treatment option for nasal septal perforations, failed the surgical closure for several times. Further studies should be performed before clinical implementation.

1776

Intranasal trigeminal function in patients with nasal septal deviation: the effect of surgery.

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Septal and Turbinate surgery 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Background: The intranasal trigeminal system is responsible for the perception of airflow during nasal breathing. The aim of our study was to investigate the trigeminal sensitivity in patients with nasal septal deviation with nasal obstruction and the effect of septoplasty on trigeminal perception. Methodology/principal: Intranasal trigeminal function assessed in 19 patients with nasal septal deviation undergoing septoplasty (before and 6 months after surgery) and in 19 controls with similar nasal septal deviation without symptoms. Testing included lateralisation test, trigeminal sticks test and CO₂ pain threshold. Nasal obstruction evaluated with NOSE score. Results: CO₂ pain responsiveness, lateralization test score, and discrimination stick test score were significantly lower in patients at baseline assessment compared to controls ($p < 0.05$, $p < 0.05$, $p < 0.001$). No differences were found in trigeminal sensitivity before and after septoplasty. However, NOSE score was significantly improved in patients after surgery ($p < 0.001$). Conclusion: Septoplasty had no negative effect on trigeminal sensitivity. Patients with nasal septal deviation seeking for surgery had lower trigeminal function than subjects with similar septal deviation but no symptoms.

Acute Rhinosinusitis 1

1191

Has COVID-19 Changed Pediatric Acute Rhinosinusitis Epidemiology During the First Two Pandemic Years?

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Acute Rhinosinusitis 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

IMPORTANCE: The coronavirus (COVID) years were associated with a decrease in all-cause upper respiratory tract infections due to social distancing measures in different severities. **OBJECTIVE:** To study national pediatric acute rhinosinusitis (ARS) burden fluctuations before and during the first two COVID years. **DESIGN:** Cross-sectional, population-based study covering the three pre-COVID years (03/2017-02/2018, 03/2018-02/2019, and 03/2019-02/2020) and the first two COVID years (03/2020-02/2021 and 03/2021-02/2022). Records were retrieved from Clalit Health Services, the largest Healthcare Maintenance Organization, insuring 51.6% of the pediatric population (~1.37 million children <5 years). Urinary tract infection (UTI) was compared for time trend analysis due to its lack of airborne-transmitted pathogenesis.

SETTING: Nationwide community clinics and hospitals.

PARTICIPANTS: Children <5 years with ARS and UTI episodes were categorized according to age (0-1, 1-5, 5-15 years) and presentation date. Demographics, comorbidities, setting, and antibiotic prescriptions were collected. **INTERVENTION:** COVID-19. **MAIN OUTCOME MEASURES:** The average ARS and UTI episodes of the three pre-COVID years were used to calculate incidence rate ratios (IRRs) of the two COVID years, analyzed separately. Seasonal variations were explored. **RESULTS:** We identified 44,483 ARS and 121,263 UTI episodes. There was a substantial reduction in ARS episodes during the COVID years (IRR 0.36, 95%CI 0.24-0.56, $p < 0.001$). Although UTI episode rates also decreased during COVID (IRR 0.79, 95%CI 0.72-0.86, $p < 0.001$), the



1397

Orbital Complications of Acute Rhinosinusitis – Surgical management with combined endoscopic endonasal and external approach : A case series from single institution

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Acute Rhinosinusitis 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Orbital complications of acute rhinosinusitis are often associated with the delay in diagnosis and, or inadequate treatment. The orbital complications may range from preseptal cellulitis, orbital cellulitis, orbital abscesses, and subperiosteal abscesses to intracranial extension. We report a case series of 3 patients, including a pediatric case, managed with combination of functional endoscopic sinus surgery and external approach - anterior orbitotomy. Post-operatively, medical treatment continued according to the microbiological analysis. We aim to discuss also the current strategies for the management of orbital complications of acute rhinosinusitis for better post-treatment outcomes.

1405

Cost and Utilization of CT Scans for Acute Rhinosinusitis Between 2016 and 2018

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Acute Rhinosinusitis 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Acute rhinosinusitis (ARS) is a common problem in the United States. As most cases can be diagnosed clinically, computed tomography (CT) imaging in ARS is not recommended. However, the extent of continued CT scanning and associated healthcare expenditures (HCE) is unknown. We sought to characterize CT scan cost and utilization from 2016 to 2018. Using IBM's MarketScan Commercial Claims Database, we conducted a retrospective cross-sectional analysis of CT scan utilization for patients with a primary diagnosis of acute sinusitis between January 1, 2016 and December 31, 2018. Total HCEs were stratified by year and region. One-way ANOVA tests were used to examine both differences among mean HCEs by region and CT scan utilization by physicians over time ($\alpha=0.05$). Analyses were performed using Stata version 17. Between 2016 and 2018, almost 25,000 patients received a CT scan for ARS, though significantly fewer scans were ordered each successive year ($p<0.001$). HCEs totaled \$10,741,525. While otolaryngologists and radiologists ($n=9,601$; 84.4%) were less likely to order CT scans over time, there was no change in CT scans ordered by primary care physicians ($n=1,334$; 11.7%) ($p<0.01$). More CT scans were ordered in the South than in any other region ($p<0.01$), though the North Central region had the highest mean HCEs per patient (\$469.63). While otolaryngologists have appropriately reduced CT utilization for ARS, results indicate a need for outreach efforts to reduce costly and unnecessary CT use by primary care practitioners.



1556

Rhinogenic Brain Abscesses – A Case Series from Emergency ENT department and Literature Review

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Acute Rhinosinusitis 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Brain abscess has been a known complication of head trauma, dental and rhinogenic infections and congenital heart defects. Nose-derived intracranial complications are less common than otogenic ones, and infections caused by nasal and sinus trauma, foreign bodies and surgery are more common than those caused by inflammation alone. Intracranial complications of sinusitis and AOM are best managed in a specialist centre with multidisciplinary input of otorhinolaryngology(ORL) and neurosurgery. Concurrent ORL and neurosurgical intervention reduces abscess recurrence and requirement for revision neurosurgery in sinogenic complications and should represent the standard of care. Endoscopic sinus surgery is the ORL modality of choice in experienced hands. We report an unusual case series of two patients who were admitted to our emergency ENT department with intracranial abscess caused by untreated acute rhinosinusitis. We performed combined rhinological and neurosurgical approach with our multidisciplinary team. With our experience in these cases, we aim to discuss the adequate medical and surgical management of rhinogenic intracranial abscesses.

1572

SEAWATER NASAL WASH EFFICACY ON NASAL SYMPTOMS AND VIRAL LOAD IN COVID-19 AND URTIS

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Acute Rhinosinusitis 1 | Room 9 Olympic Hall – Level 0 | Monday 19/06/2023

Objective: To assess efficacy of seawater nasal wash on mild-to-moderate COVID-19 and viral URTIs. **Methods:** Randomized, controlled, parallel study in 355 adults with ≤ 48 h-rhinologic symptoms. **Active group:** 4-daily nasal washes with Physiomer® (undiluted isotonic seawater spray). **Assessments:** 3 weeks-daily symptoms record; viral load measurement on Day0, Day5, Day14, Day21. (*= $p < 0.05$) **Results:** All subjects: In active group, smell and taste disorders resolved earlier (-2days and -3days*), with the earliest resolution of alteration/loss of smell (-3.9days*), post-nasal drip (-2.9days*), dyspnea (-1.3day*), face pain/heaviness (-2.6days*) in subjects with severe nasal symptoms. **COVID-19 subjects:** The active group recovered 1.6 day* earlier the ability to accomplish daily activities, with the earliest resolution of anosmia in subjects with severe nasal congestion (-5.2days*). Evolution towards more severe COVID-19 was lower in active (Day7:9.1%, Day14:0%, Day21:0%) vs control (Day7:13.7%, Day14:12.8%, Day21:7.9%), with earlier viral load reduction, especially in subjects with severe nasal congestion ($\geq 1.5 \log_{10}$ copies/10000 cells:71.4% vs 47.4% at Day3). **URTIs subjects:** Rhinorrhea, post-nasal drip and overall sickness resolved 3.5days*, 3.7days* and 4.3days* earlier in active group, with a higher viral undetectability reached from day3 vs control (62.1% vs 36.4%). **Conclusion:** This randomized controlled trial demonstrated benefit and safety of seawater nasal wash in mild-to-moderate COVID-19 and viral URTIs.



1610

FUNGAL RHINOSINUSITIS: A RETROSPECTIVE STUDY FROM A TERTIARY HOSPITAL IN PORTUGAL

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Acute Rhinosinusitis 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Background: Fungal rhinosinusitis (FRS) is a well-known entity that can be divided in non-invasive and invasive forms. This includes a spectrum of disease processes that vary in clinical and histological findings and treatment options. **Objectives:** Clinical review of presentation, management and predictive clinical factors related to FRS. **Methods:** Retrospective study of patients diagnosed with FRS and submitted to surgery between 2017 and 2022. Data collection included patient demographics and clinical features. Statistical analysis was performed via descriptive statistics and non-parametric tests. **Results:** 41 patients were diagnosed with suspected FRS based on clinical and imaging criteria. Mean age was 55 years-old and 56.1% had comorbidities. The most prevalent symptoms were rhinorrhea and nasal congestion, with maxillary sinus being the most affected (75.6%). Cultures or histology reports were positive for fungal disease in 56.1%. Fungus ball was the most frequent (36.6%), followed by allergic FRS-like (12.2%) and allergic FRS (7.3%). The dominant isolated fungi was *Aspergillus* in non-invasive and *Mucor* in invasive forms. An association was found between allergic FRS and surgical reintervention ($p < 0.001$). Recurrence was associated with both asthma and previous sinus instrumentation ($p = 0.009$; $p = 0.001$). **Conclusions:** Our study suggests that previous sinus surgery is associated with FRS recurrence. Due to fastidious cultures and challenges in fungal diagnosis, risk factors and clinical probability should be considered when approaching a patient with suggestive symptoms of FRS.

CRS – diagnosis and investigations 1

1172

Comparison of mucus and serum biomarker sampling in chronic rhinosinusitis with nasal polyps

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CRS – diagnosis and investigations 1 | Room 10 Peroto – Level 0 | Monday 19/06/2023

Objective The objective of this study was to analyze advantages and disadvantages of mucus and serum for biomarker analysis. **Methods** Prospective study of 67 CRSwNP patients. All patients were followed over 24 months and over 9 time points after functional endoscopic sinus surgery. At each time points, the nasal polyp score (NPS) was assessed, mucus as well as serum was collected and selected biomarkers were measured. Mean, standard deviation and variance, missing values, the correlation of the biomarkers to the NPS over time and to early recurrences were calculated. Additionally, the diurnal rhythm of all biomarkers was measured in order to assure stable biomarker values during sampling times. **Results** All biomarkers showed stable values during sampling times. Serum biomarker levels displayed higher percentages of missing values compared to mucus biomarkers. Mucus periostin ($p < 0.001$, $r = 0.89$), mucus IgE ($p < 0.001$, $r = 0.51$), serum periostin ($p < 0.001$, $r = 0.53$), mucus CST1 ($p < 0.001$, $r = 0.27$), and serum IgE ($p < 0.01$, $r = -0.18$) were the best marker and medium combinations to track the NPS over time and to predict recurrences. Mucus serpinF2 was negatively correlated and predicted early recurrences ($p = 0.026$, $R^2 = 0.015$). **Conclusions** Serum and mucus both represent viable mediums for "liquid biopsies". All markers showed stable values during the sampling times. The most promising marker/ medium combinations over time to track disease severity were mucus periostin, mucus IgE, serum periostin, mucus CST1, and serum IgE. Mucus serpinF2 was the best biomarker to predict early recurrences.



1204

Endotyping chronic rhinosinusitis by nasal secretions

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CRS – diagnosis and investigations 1 | Room 10 Peroto – Level 0 | Monday 19/06/2023

Background: The EPOS guidelines (2020) advocate early endotyping is for prompt categorisation especially regarding the increasing evidence of patient-tailored therapy.

Methods: We aimed to investigate the diagnostic value and reproducibility of sinonasal secretions sampling both by endoscopic aspiration and nasal blown secretions. First, preoperative secretion analysis of 53 CRS patients was compared to subsequent operative tissue analysis. Second, secretion analysis on two different time points was compared for 10 postoperative CRS patients with type 2 (T2) inflammation and 10 control participants.

Results: The sensitivity to detect T2 inflammation was higher in nasal aspiration samples (85%) compared to nasal blow secretions (32%). A specificity of 100% for both techniques was obtained. A 90% reproducibility for T2 eosinophil detection was found by sampling on different time points regardless of the technique. Of the T2 patients, 60% showed no T2 inflammatory pattern more than one year after FESS surgery. **Conclusions:** Nasal secretions sampling, especially aspiration of nasal secretions, is useful in the detection of T2 inflammation in CRS pathology. We proposed a structured histopathology analysis for sinonasal secretions useful in daily clinical practice, including Congo red staining sensitive for eosinophilic cells and free eosinophil granules. Analysis of nasal secretions enables endotyping in an early stage, which allows more directed therapy

1208

Analysis of expression profiling data suggests explanation for difficulties in finding biomarkers for nasal polyps

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CRS – diagnosis and investigations 1 | Room 10 Peroto – Level 0 | Monday 19/06/2023

Background: Identification of clinically useful biomarkers for Nasal Polyposis in chronic rhinosinusitis (CRSwNP) has proven difficult. We analyzed gene expression profiling data to find explanations for this. Methods: We analyzed mRNA expression profiling data, GSE36830, of six uncinate tissues from healthy controls and six NP from CRSwNP patients. We performed Ingenuity Pathway Analysis (IPA) of differentially expressed genes to identify pathways and predicted upstream regulators. Results: We identified 1,608 differentially expressed genes and 177 significant pathways, and 75 upstream regulators whose activity was predicted to be upregulated. These included regulators of known pathogenic and therapeutic relevance, like IL-4. However, *only seven of the 75 regulators were actually differentially expressed in NP. Interestingly, these did not include IL-4, and four of the seven were receptors. This suggested a potential explanation for the discrepancy between the predicted and observed expression levels of the regulators, namely that the receptors, and not their ligands, were upregulated. Indeed, we found that 10 receptors of key predicted upstream regulators were upregulated, including IL4R. Conclusion: Our findings indicate that the difficulties in finding specific biomarkers for CRSwNP depend on the complex underlying mechanisms, which include multiple pathways and regulators, each of which may be subdivided into multiple components such as ligands, soluble and membrane-bound receptors. This suggests combinations of biomarkers may be needed for CRSwNP diagnostics.*

1216

Real-Life Efficacy of Dupilumab in Refractory Chronic Rhinosinusitis with Nasal Polyps

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CRS – diagnosis and investigations 1 | Room 10 Peroto – Level 0 | Monday 19/06/2023

The aim of this study was to evaluate the efficacy of Dupilumab in patients affected by chronic rhinosinusitis with nasal polyps (CRSwNP) in real-life. A single-center retrospective observational study on severe CRSwNP patients, treated with dupilumab, was conducted. Nasal Endoscopic Polyp Score (NPS), Visual Analogue Scale (VAS) symptom score, Sino-nasal Outcome Test (SNOT-22), Asthma Control Test (ACT) score, Fractional exhaled nitric oxide (FeNO), eosinophils blood cells and prednisone intake were assessed at baseline and after 6 months. 37 patients were included. 29 patients (87,9%) presented with asthma; Aspirin Exacerbated Respiratory Disease (AERD) in 14 patients (42,4%). A statistically significant decrease in the SNOT-22 score was observed (median difference -63; 95% CI: -68; -58; $p < 0.001$) with median t0 67 and IQR (61;90) to t6 12 (5;15). Reduction in NPS, median t0 NPS 7; (IQR:4;6), median t6 NPS 1; (IQR:0;1) $p < 0.001$, was greater in patients with AERD. The median baseline VAS score was 6 (IQR:6;7) and the differences between t0 and t6 were statistically significant $p < 0.001$. Significant improvement in olfactory dysfunction. Dupilumab treatment effects have been demonstrated with a significantly reduced symptoms, polyp scores, and systemic corticosteroid use, resulting in an increase health-related quality of life in patients with severe CRSwNP, regardless of the presence or absence of asthma or AERD.



1238

Transcriptional analysis of nasal polyps fibroblasts reveals a new source of pro-inflammatory signaling in CRSwNP

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CRS – diagnosis and investigations 1 | Room 10 Peroto – Level 0 | Monday 19/06/2023

Background: Fibroblasts cells have recently been identified as critical cells triggering tissue-specific inflammatory responses. Persistent activation of fibroblasts inflammatory program has been suggested as an underlying cause of chronic inflammation in a wide range of tissues and pathologies. Nevertheless, the role of fibroblasts in the emergence of chronic inflammation in the upper airway has not been previously addressed. We aimed to elucidate whether fibroblasts could have a role in the inflammatory response in nasal polyps (CRSwNP). **Methodology:** We performed whole-transcriptome microarray in fibroblast cultured from CRSwNP samples and confirmed our results by qRT-PCR. We selected patients without other associated diseases in upper airway. To investigate shifts in transcriptional profile we used fibroblasts from nasal polyps and uncinate mucosae from patient with CRSwNP, and fibroblasts from uncinate mucosae from healthy subjects as controls. **Results:** This study exposes activation of a pro-inflammatory and pro-fibrotic transcriptional program in nasal polyps and CRSwNP fibroblasts when compared to controls. Our Gene-set Enrichment Analysis (GSEA) pointed to common up-regulation of several pro-inflammatory pathways in patients-derived fibroblasts, along with higher mRNA expression levels of cytokines, growth factors and extracellular matrix components. **Conclusions:** Our work reveals a potential new source of inflammatory signaling in CRSwNP, and suggest that deregulated inflammatory signaling in tissue-resident fibroblasts could support a Type-2 inflammatory response.



1262

Nasal Nitric Oxide (nNO): Potential role in the diagnosis of aspirin/NSAID hypersensitivity in patients with Chronic Rhinosinusitis with Nasal Polyps (CRSwNP)

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CRS – diagnosis and investigations 1 | Room 10 Peroto – Level 0 | Monday 19/06/2023

Background Although the EU guidelines recommend changes in nasal airflow resistance/patency/geometry to assess nasal response during nasal aspirin challenge, changes in parameters indicative of inflammation might be a good alternative. **Objectives** To determine changes in the concentration of nasal and exhaled NO and type 2 inflammatory cytokines IL-4, IL-5 and IL-13 in the nasal cavity after a nasal aspirin challenge in CRSwNP patients with/without a positive history of aspirin/NSAID hypersensitivity. **Methods** 26 CRSwNP patients and 10 controls were challenged nasally with increasing doses of lysine aspirin starting with 5 mg aspirin equivalent, then 10 mg, 20 mg, 40 mg at 45 min intervals, until either the patient had responded with induction/aggravation of nasal and chest symptoms plus a 20% decrease in peak nasal inspiratory flow (PNIF) or forced expiratory volume in 1 second (FEV1) or a cumulative dose of 75 mg was reached. Nasal hyperreactivity was excluded by applying 100 mcl isotone saline. nNO and FeNO were measured before and after the challenge. Nasal fluid was harvested by placing Merocel® sponges in the nostril during 10 min at different timepoints. **Results** When nasal aspirin challenge induced/aggravated nasal symptoms, it was associated with a decrease in nNO (av. 53%), in PNIF (av. 46%) or in FEV1 (av. 27%). Preliminary data show a positive correlation between PNIF and nNO. FeNO remained constant. **Conclusion** Nasal NO measurement might be a good objective technique to assess aspirin/NSAID hypersensitivity in nasal aspirin challenges.

1584

The burden of migraine on quality of life in chronic rhinosinusitis

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CRS – diagnosis and investigations 1 | Room 10 Peroto – Level 0 | Monday 19/06/2023

To determine the impact of comorbid migraine on quality of life (QOL) in chronic rhinosinusitis (CRS). Methods: A total of 213 adult patients with CRS were recruited. All participants completed a 22-item Sinonasal Outcome Test (SNOT-22), from which total and validated nasal, ear/facial pain, sleep and emotional subdomain scores were calculated, and the 5-dimension EuroQol general health questionnaire (EQ-5D) from which the visual analogue scale (VAS) and health utility value (HUV) were calculated. The presence of comorbid migraine was determined by a score of ≥ 4 on the 5-item Migraine Screen Questionnaire (MS-Q). Results: Of participants, 36.2% were screened positive for having comorbid migraine. The mean SNOT-22 score was 64.9 (SD: 18.7) in participants with migraine and 41.5 (SD: 21.1) in participants without migraine ($p < 0.001$). The mean EQ-5D VAS and HUV were 60.2 (SD: 21.9) and 0.69 (SD: 0.18), respectively, in participants with migraine and 71.4 (SD: 19.4) and 0.84 (SD: 0.13), respectively in participants without migraine ($p < 0.001$ for both). Higher ear/facial pain (OR=1.22, 95%CI: 1.10 – 1.36, $p < 0.001$) and sleep (OR=1.11, 95%CI: 1.04 – 1.18, $p = 0.002$) SNOT-22 subdomain scores were positively associated with migraine. The SNOT-22 item scores related to dizziness, reduced concentration, and facial pain, in descending order, were most associated with migraine. Presence of nasal polyps (OR=0.24, 95%CI: 0.07 – 0.80, $p = 0.020$) was negatively associated with migraine. Conclusion: Comorbid migraine may be relatively common amongst CRS patients and its presence is associated with significantly worse QOL. Dizziness as a symptom in CRS patients may be particularly indicative of migraine.

Late Breaking Abstracts 1

1786

Bioequivalence of two paediatric oral suspensions of fexofenadine hydrochloride: Data from an open-label, randomised, phase 1 study

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Late Breaking Abstracts 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Fexofenadine (FEX) is a second-generation, non-sedating, H1-receptor antagonist used in allergic rhinitis and chronic idiopathic urticaria. We have developed a new oral paediatric suspension of 6 mg/mL FEX HCl (test) with potassium sorbate a widely used preservative. Here, we report bioequivalence data of the test vs marketed suspension of 6 mg/mL FEX HCl (reference) from a phase 1, open-label, randomised, 2-treatment, 2-sequence, 4-period crossover study separated by a 7-day washout period, in healthy adults. Key pharmacokinetic parameters assessed C_{max} (ng/mL), t_{max} and AUC (ng•h/mL). Treatment-emergent adverse events (TEAEs) were recorded. The study randomised and treated 68 adults (1st dose: 67 [test], 68 [reference]; 2nd dose: 65 [test], 64 [reference]). Mean age was 39.5 years, 57.4% were male, mean BMI was 25.5 kg/m². Plasma concentrations of test vs reference formulations were similar after administration of a single dose. Bioequivalence between test and reference formulations was demonstrated with 90% CI of the geometric LS mean ratio within 80%–125% for each parameter. The ratio observed for C_{max}, AUC_{last} and AUC was 1.1 (1.02–1.17), 1.1 (1.03–1.14) and 1.1 (1.03–1.14), respectively. The median time to reach maximal concentration (t_{max}) for test and reference formulations was approximately 1 hour for both 1st and 2nd doses. There were no serious TEAEs or discontinuations due to TEAEs. The test (paraben-free) vs reference FEX paediatric suspensions were bioequivalent under fasting conditions, with consistent safety profile. Funding: Study was funded by Sanofi.

1789

Parosmia Score : a valuable tool to quantify olfactory distortions

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Late Breaking Abstracts 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Introduction Qualitative OD can be split into parosmia (distorted perception triggered by an odor source) and phantosmia (distortion without odorous trigger). Parosmia and phantosmia are mostly unpleasant and occur frequently after postinfectious OD. While testing quantitative OD is established and validated by many tools (Sniffin' Sticks, UPSIT, many others) parosmia can't yet be measured and the gold standard still is the patient's story. **Aim of the study:** Assess presence, absence and evolution of distortions by means of parosmia score. **Methods** A retrospective study was conducted on consecutive patients (n=554) with smell and taste disorders. All patients underwent a structured patients history, ear, nose, and throat examination, Sniffin' Sticks testing and filled in a questionnaire with four parosmia questions. For 71 patients a second parosmia score could be recorded 22 months after the first assessment. **Results** A total of 554 patients (307 females) were included with a median age of 51 years. Patients with parosmia and/or phantosmia have lower parosmia score ($p < 0.001$) compared to patients without qualitative disorders. In the follow-up group (n=71), 47 patients (66,2%) had no change in their parosmia status, 15 patients (21,1%) had no parosmia anymore and 9 patients (12,7%) newly developed a parosmia. Analysis of the first versus second assessment reliably indicated these changes. **Conclusion** The parosmia score provides valuable and additional clinical tool regarding the assessment and follow-up of parosmia and complements structured patients history.



1790

Revision Radio Frequency Ablation turbinate reduction (RFATR)

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Late Breaking Abstracts 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Introduction Radiofrequency ablation (RFA) relieves nasal obstruction and improves quality of life (QoL) in patients suffering from inferior turbinate hypertrophy (ITH). It is considered safe, easy to perform, but not always sustain a long lasting effect. We noted that revision RFA may Our aim was to establish the benefit from revision of RFA in patients suffering from inferior turbinate regrowth after RFA. Study Design Prospective cohort study. Methods Prospective Cohort study, including patients suffering from ITH undergoing RFA between 9.2017-1.2023 in Tel Aviv Medical Center. Patients were followed for 6 month post operatively. We retrieved patients' complaints, clinical findings and QoL questionnaires. Results 23 of 230 patients (11.7%) underwent revision RFATR, due to lack of sufficient improvement. Mean time to revision was 6.1±7.0 months. Only one patient failed revision RFATR and required surgery. Conclusion Revision RFA demonstrated effectiveness and is a playable instrument in the rhinology clinic. High satisfaction was noted not only after RFA but also after rev RFATR, and was established in our entire cohort.



1795

The Impact of Adhesions on Nasal Airflow: A Quantitative Analysis Using Computational Fluid Dynamics

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Late Breaking Abstracts 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Methods: CT scans of healthy adults were used to construct 3D nasal airway computational models. A single virtual 2.5 mm diameter NA was placed at five sites within each nasal cavity bilaterally (commonly seen following NAO surgery), resulting in 10 NA models and 1 NA-free control for each subject. CFD analysis was performed on each NA model and compared with the subject's NA-free control model.

Results: 4 subjects were recruited to create 44 computational models. The NA caused the airflow streamlines to separate, leading to a statistically significant increase in mucosal temperature immediately downstream to the NA (wake region). Changes in the mucosal temperature in the wake region of the NA were most prominent in anteriorly located NA with a mean increase of 1.62°C for the anterior inferior turbinate NA ($p < 0.001$) and 0.63°C for the internal valve NA ($p < 0.001$).

Conclusion: Nasal adhesions result in marked disruption to airflow patterns and reduced mucosal cooling on critical surfaces, particularly in the wake region. Reduced wake region mucosal cooling may be a contributing factor to the exaggerated perception of nasal obstruction experienced by patients with nasal adhesions.



1797

Efficacy of Vidian Neurectomy and Posterior Nasal Neurectomy in the Management of Nonallergic Rhinitis: A Systematic Review

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Late Breaking Abstracts 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Aims: Endoscopic vidian neurectomy (EVN) and posterior nasal neurectomy (PNN), including surgical (SPNN) and cryoablative (CPNN) methods, may improve symptoms in non-allergic rhinitis (NAR). We compared the efficacy, side effect profile and complication rate between EVN and PNN for NAR.

Methods: A systematic review of primary articles that reported original patient data for EVN/PNN was conducted using Embase, Medline, Pubmed and Cochrane databases since 2006, according to PRISMA guidelines. The primary outcome was improvement in NAR symptom severity. Secondary outcomes included the incidence of post-operative side effects or complications. Results: 58 articles met the search criteria with a total of 9 studies (including 2 RCTs) eligible for inclusion. There was a pooled sample of 229 NAR patients that underwent EVN (n=65; 28.4%), SPNN (n=50; 21.8%) or CPNN (n=114; 49.8%). For all 3 techniques, there was statistically significant improvement in nasal symptoms, particularly rhinorrhoea, nasal congestion and obstruction along with QOL. Heterogeneity in outcome reporting prevented meta-analysis and direct comparison of efficacy. The pooled incidence of post-operative complications for EVN (n=65), SPNN (n=50) and CPNN (n=70) were 30.8% vs 0% vs 2.9% for dry eye, 16.9% vs 0% vs 1.4% for palatal/cheek numbness and 0% vs 6% vs 4.3% for bleeding.

Conclusion: EVN, SPNN and CPNN are similarly efficacious for patients with NAR refractory to medical management. SPNN and CPNN are associated with lower rates of complications (dry eye and palatal/cheek numbness) compared with EVN.



1800

Epiglottic collapse in patients with Obstructive Sleep Apnea

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Late Breaking Abstracts 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

OSA occurs due to the collapsibility of the upper airway structures during sleep. When the upper airway is subjected to negative pressure during inspiration, the collapsible soft tissues may undergo complete or partial obstruction of the upper airway, resulting in increased blood pressure, hypoxemia, and increased oxidative stress in the body. Polysomnography (PSG) is the gold standard for diagnosis of OSA, the frequency of obstructive events is documented in the apnea hypopnea index (AHI); the severity of the OSA is classified based on this information. Drug induced sleep endoscopy (DISE) demonstrates sometimes a significant difference between PSG results. Torre C et al. systematically reviewed 14 studies regarding epiglottis collapse (EC) prevalence in (OSA) patients and found a higher EC prevalence than previously described. The epiglottis has been implicated in 12% of snoring cases, and sound arising from it has a higher pitch than palatal snoring. CPAP, surgery, and positional therapy were also considered as an option to treat EC. Lateral head position may reduce the frequency of EC. CPAP, on the other hand, may accentuate epiglottis collapse. Surgery may help reduce snoring in some patients with a lax epiglottis and improve OSA in patients undergoing multilevel surgery. We evaluated various combination of EC, palatal collapse, tongue base collapse, and oropharyngeal- tonsillar collapse using our DISE-based EC staging system (0 - no collapse; 1 - 50% view occlusion; 2 - 75% view occlusion; 3 - 100% view occlusion). According to this staging system we evaluated



1806

How long is the journey from septoplasty to anterior skull base surgery? – challenges faced by a junior ENT surgeon

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Late Breaking Abstracts 1 | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

The objective of the document is to describe the first surgical steps and the first surgical interventions made by an ENT surgeon at the beginning of the career. Furthermore, the learning curves needed to perform a septoplasty and a complete functional endoscopic sinus surgery and the learning curves for more complex surgical interventions like the sphenoid sinus approach for pituitary adenoma are described. The presentation contains 24 classical or endoscopic septal deviation surgeries, 10 antrostomies and 3 anterior ethmoidectomies performed by the 31 year-old author during the residency period, under the observation of an experienced surgeon, but also as a specialist. Also, using existing data from literature, a review to establish the learning curves for each type of surgical intervention was made. All 24 patients in which septoplasty was performed had nasal obstruction prior to the intervention. 8 patients also had obstructive sleep apnea syndrome. 6 of the patients with septoplasty procedure also had inferior turbinate radiofrequency reduction. For classical septoplasty the complication rate is much lower after the first 30 cases. Regarding endoscopical sinus surgery, including the frontal sinus approach, the complications decrease significantly after 90 surgical interventions. The importance and technical difficulties of septal surgery are often underestimated. Regarding endoscopic sinus surgery, in order to circumvent the learning curve, a rigorous training period during residency under observation of an experienced surgeon is mandatory.



Miscellaneous 1

1219

The Role of Surgery in Orbitocranial Fungal Infection treatment in the Era of Azole Antifungals

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Miscellaneous 1 | Room 12 Hall 40 - Level 6 | Monday 19/06/2023

Introduction: Aggressive surgery has been justified in orbitocranial fungal infection (OCFI) as life-saving, despite its significant morbidity. Over the past two decades, early use of azole agents has been introduced as first-line treatment demonstrating promising outcomes. This work aimed to provide real-life data on azole treatment outcomes and the role of surgery in the current management of OCFI. Methods: Data was collected retrospectively from a chart review from four participating centers and a systematic literature review. The study group included patients with OCFI treated with azole antifungals. The control cases were treated with other antifungal agents. The cranial and orbital involvement degree was staged based on the imaging. The extent of the surgical resection was also classified to allow for inter-group comparison. Results: There were 125 patients in the azole-treated group and 153 in the control group. Among the patients with OCFI cranial extension, 23% were operated on in the azole-treated group and 18% in the control group. However, meninges and brain resection were performed only in the controls (11% of patients) and never in the azole antifungals group (p-value=0.045). Orbital involvement required surgery in 26% of azole-treated cases and 39% of controls. Despite a more aggressive cranial involvement (p-value<0.01), azole-treated patients' mortality was significantly lower than in controls, with a OCFI-specific mortality rate of 21% vs. 52%. A similar trend was found for the extent of the orbital disease and the orbital surgery.



1243

A real-world user survey on the effectiveness of a hypertonic seawater nasal spray as an add-on to pharmacological treatment in patients with ENT diseases

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Miscellaneous 1 | Room 12 Hall 40 - Level 6 | Monday 19/06/2023

Scarce real-world evidence exists regarding the usability and effectiveness of saline nasal sprays. This user survey explored user satisfaction and clinical efficacy of HSS-Mini, a hypertonic seawater nasal spray (Sinomarin® Mini, Gerolymatos International). Sixty patients who visited pharmacies with a prescription to use nasal corticosteroids or vasoconstrictors for an underlying ENT condition participated in the study. Patients used HSS-Mini as an add-on treatment for up to two weeks. At the end of the evaluation period, the product's efficacy, its use pattern, and symptom severity before and after HSS-Mini use were scored. Users were highly satisfied with the spray; 93.6% was satisfied with the product, 91.6% with its efficacy and 93.3% with the overall efficacy from its combined use with medication. Reduction of medicated product intake was reported by 93.4% of users. Users were willing to use HSS-Mini even in the absence of medication and recommend it to other users. Patients experienced reduced stuffy/blocked nose, runny nose, sneezing, itchy/dry nose and other nasal symptoms ($P < 0.0001$). Similarly, quality of life symptoms such as fatigue, reduced productivity, sleep quality, emotional tiredness and overall feeling were also improved ($P < 0.0001$). These results support continuous adjunct use of HSS-Mini for optimal symptom management in sinonasal diseases.



1435

Hyperpneumatization of the paranasal sinuses in patient with Cushing's Syndrome

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Miscellaneous 1 | Room 12 Hall 40 - Level 6 | Monday 19/06/2023

INTRODUCTION:Hyperpneumatization of the paranasal sinuses, also called Pneumosinus dilatans, is defined as a generalized or partial enlargement of the frontal, sphenoid, or ethmoid sinuses that contain only air. As the size increases, it can cause deformation of the bone and tissues that cover it. It can be idiopathic, associated with other disorders such as brain atrophy, or iatrogenic.**MATERIAL AND METHODS:** A 42-year-old patient with a history of arterial hypertension, disability secondary to hydrocephalus with a shunt valve from birth and epilepsy, and currently with Cushing's Syndrome for which he is going to undergo surgery with a nasal approach.**RESULT:** For the planning of the surgery, a cranial computed tomography (CT) was performed where post-surgical changes with ventricular shunt valve that penetrates through the left frontal region, thickening of the diploe with hypertrophic pneumatization of both frontal sinuses are visualized.**CONCLUSION:** The diversion of cerebrospinal fluid for a prolonged period during the paranasal sinus pneumatization process can cause or aggravate paranasal sinus hyperpneumatization, the frontal sinus being the most frequently affected.

1514

A Rare Case of Primary Amyloidosis Presenting as a Nasopharyngeal Mass

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Amyloidosis is a rare systemic depositional entity. The most common site of localized head and neck disease is the larynx. We present a patient with primary localized nasopharyngeal amyloidosis, which is rather uncommon, with only 41 cases described in the literature. A healthy 45-year-old Caucasian male presented to our department due to unilateral hearing loss since 3 months. Otoscopy and audiometry exams suggested right otitis media with effusion and conductive hearing loss respectively. Nasendoscopy revealed a lesion obstructing the right Eustachian tube opening. MRI showed a suspicious irregular mass with heterogenous contrast enhancement arising from the right Rosenmuller fossa. Subsequently, a nasal endoscopy with biopsy was performed under local anesthesia. The histopathology exam demonstrated an amyloid plaque confirmed on Congo Red staining. Further investigations for potential systemic disease or other conditions related to a secondary form of amyloidosis were negative and eventually, the diagnosis of primary localized nasopharyngeal amyloidosis was confirmed. Due to the absence of lasting follow-up protocols, no standard treatment has been defined. In our case, a watchful waiting approach was decided, with symptomatic treatment and regular follow-up, given the very slow progression of the disease. Surgical debulking of the mass is also a treatment option for patients with localized amyloid deposition of the nasopharynx and significant interference in their quality of life, according to our literature review.

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Quantifying difficulty in endoscopic endonasal surgery – a modified Delphi method approach

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Introduction Surgical difficulty quantification is a crucial step in the development of curricula for progressive training: this need remains unmet in the field of endoscopic endonasal surgery (EES). The objective of this work was to classify the basic skills and procedures of EES. **Methods** A three-round modified Delphi study was conducted among 59 international experts, selected on their publications in the field of EES and medical education, or EES surgical simulators. In round#1, basic skills competencies and EES procedures were identified and the basic skills required for these procedures were listed. In round#2, the expert panel ranked the difficulty of basic skills, and in round#3, the difficulty of the EES procedures. The basic skills were grouped into 3 categories of increasing difficulty, and the subsequently calculated difficulty of each EDC procedure was compared with the experts' score. **Results** 23 basic skills and 26 EES procedures were identified. 15 experts from 5 countries participated in rounds 2 and 3. Basic skills were ranked in 3 groups of increasing difficulty, from easiest (navigation with a 0° telescope) to most difficult (suturing in the nasal cavity), with >90% agreement. The easier procedure was polypectomy; the most difficult was Vidian neurectomy. The correlation between the expert score and the "basic skills" score reached an R^2 of 0.75, reflecting the cumulative effect of required skills on procedure difficulty. **Conclusion** This study provides a basis for quantifying surgical difficulty in EES and developing a progressive educational curriculum

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Interleukin-4 receptor alpha (IL-4R α) blockade protects from IL-4 driven loss of smell in mice

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Introduction: Dupilumab, a human IL-4R α monoclonal antibody that blocks IL-4 and IL-13 signaling, improves sense of smell in patients with chronic rhinosinusitis with nasal polyps (CRSwNP) via mechanisms not well understood. We investigated the effects of IL-4 and IL-13 on the mouse olfactory system in vitro and in vivo. **Methods:** IL-4R α expression was measured using single-cell RNA sequencing data and immunofluorescence. Sense of smell was assessed in wild-type and IL-4R α -knockout mice by time to discover hidden food after 5 days' intranasal administration of IL-4/IL-13. IL-4R α antibody was injected intraperitoneally. **Results:** IL-4R α was widely expressed in murine olfactory epithelium, including immature and mature olfactory sensory neurons (OSN). IL-4 and IL-13 each significantly increased calcium uptake in murine OSN in vitro. Intranasal administration of IL-4, but not IL-13, induced loss of smell in wild-type mice. IL-4R α inhibition/elimination protected from IL-4 driven loss of smell (mean \pm SE time to discover food 149 \pm 27s with IL-4 vs 71 \pm 13s with IL-4 + IL-4R α antibody [P<0.01] in wild-type mice; and 59 \pm 25s with IL-4 in IL-4R α -knockout mice [P<0.001]). **Conclusions:** IL-4, via modulation of OSN activity, may play an important role in smell function. The therapeutic effects of dupilumab on smell may be due to direct modulation of the actions of IL-4.



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Preoperative medications for better outcome of awake rhinology procedures.

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Introduction: COVID19 resulted in suspension of routine Rhinology cases. This invariably increased the waiting list. By the time the vaccination drive was thorough, and immunity was developed there was an increase the surgical waiting list. Efforts have been made to decrease the waiting list. One of the efforts have been introducing awake surgeries. Local anaesthesia procedure, it is not dependent on anaesthetist availability. These procedures can be done either in procedure room, theatres, or clinics. The goal is to decrease the need of mechanical ventilation thus avoiding the use of theatre capacity. Aim: We hypothesise that giving certain preoperative medications before the local anaesthesia procedure increases helps in better surgical outcome. Method: 40 patients underwent Awake rhinology surgeries, these patients were given preoperative medications. Conclusion: Pre operative medications not just reduces the intraoperative pain and bleeding but also reduces anxiety.

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Sinonasal Stent Coated with Sustained-Release Varnish of Mometasone Furoate Inhibited Pro-Inflammatory Cytokine Release from Macrophages: An in vitro Study

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The aim of the study was to develop a sustained-release varnish (SRV) containing mometasone furoate (MMF) for sinonasal stents (SNS), to reduce the mucosa inflammation in the sinonasal cavity. SNS segments coated with SRV-MMF, or SRV-placebo were daily incubated in fresh DMEM medium at 37°C for 20 days. The immunosuppressive activity of the collected DMEM supernatants were tested on the ability of mouse RAW 264.7 macrophages to secrete the cytokines tumor necrosis factor α (TNF α), interleukin (IL)-10 and IL-6 in response to LPS. The cytokine levels were determined by the respective Enzyme-Linked Immunosorbent Assays (ELISA). We found that the daily amount of MMF released from the coated SNS was sufficient to significantly inhibit LPS-induced IL-6 and IL-10 secretion from macrophages up to day 14 and 17, respectively. SRV-MMF had, however, only a mild inhibitory effect on LPS-induced TNF α secretion compared to SRV-placebo-coated SNS. In conclusion, coating of SNS with SRV-MMF maintains a sustained delivery of MMF for at least 2 weeks at a level sufficient for inhibiting pro-inflammatory cytokine release. This technological platform is therefore expected to provide anti-inflammatory benefits during the postoperative healing period and may play a significant role in the future treatment of chronic rhinosinusitis.



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CFTR modulators in the treatment of CF-related chronic rhinosinusitis

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Introduction CFTR modulators are changing the disease burden in cystic fibrosis-related chronic rhinosinusitis (CF-CRS). The aim of this study is to evaluate the impact of tezacaftor/ivacaftor (T/I) and elexacaftor/tezacaftor/ivacaftor (ETI) on CF-CRS after 12 months of treatment. Material & methods A prospective study was performed, including adult CF patients, carrying at least one F508del mutation and eligible for T/I or ETI treatment. Subjective (SNOT-22, VAS) and objective (Lund-Kennedy, Modified Davos and Lund-Mackay) outcome parameters were collected before and 12 months after start of modulator treatment. Results Twenty-nine adult CF patients, of which twenty-three patients treated with T/I and six with ETI, were included. No significant reduction in subjective or objective outcome measures were observed after 12 months of treatment with T/I. Significantly lower Lund-Mackay scores were noted after treatment with ETI with a median change of -9.80 points (p=0.0018, 95% CI [-14.21; -5.76]). Conclusions In contrast to current literature, dual therapy with CFTR potentiators tezacaftor/ivacaftor is less efficient in patients with at least one F508del mutation. Highly effective triple therapy is promising in the treatment of CF-related chronic rhinosinusitis as significantly lower CT scores were observed.

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Evaluation of antibiofilm agents for the treatment of chronic rhinosinusitis in cystic fibrosis

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Introduction High-quality data on the treatment of cystic fibrosis-related chronic rhinosinusitis (CF-CRS), targeting underlying bacterial colonization and biofilm formation, are lacking. The ability of sodium bicarbonate (SNI) and xylitol (XNI) enriched rinsing salts, bacteriophages and rhDNase to degrade CF-CRS-related biofilms was investigated in vitro. **Material & methods** Isolates from the upper airways of CF patients were obtained and biofilms were grown in pathology-specific SCFM2 medium. After treatment with SNI, XNI, rhDNase, *S. aureus* phage ISP (log7 PFU/mL) and *P. aeruginosa* phages PNM and 14_01 (log7 PFU/mL), differences in colony forming units (CFU/mL) were evaluated. **Results** Fourteen isolates, of which 10 *S. aureus* and 4 *P. aeruginosa* strains, were obtained. A reduction in *P. aeruginosa* counts was observed after treatment with SNI ($p=0.001$), XNI ($p=0.0008$), PNM ($p=0.0479$) and 14_01 ($p=0.0111$). Significantly lower *S. aureus* counts were obtained after treatment with SNI ($p=0.001$), XNI ($p=0.0056$) and ISP when used in combination with levofloxacin ($p=0.0194$) and in higher phage concentrations (log8 PFU/mL, $p=0.0102$). No differences between SNI and XNI ($p=0.10$) were observed and combining bacteriophages with rhDNase resulted in higher counts ($p=0.011$). **Conclusions** Sodium bicarbonate enriched rinsing salts with/without xylitol and bacteriophages reduce CF-CRS-related biofilms and are possible candidates for further testing in clinical trials. Combination with rhDNase might reduce the efficacy of bacteriophages.



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Efficacy of Xylitol Nasal Irrigation after Functional Endoscopic Sinus Surgery: A Randomized Controlled Study

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Objectives: Xylitol is a safe, natural, five-carbon sugar with characteristics of being a natural antibacterial agent, promotion of innate bactericidal mechanisms, and having antiadhesive effect. This study was to evaluate the effect of xylitol after functional endoscopic sinus surgery (FESS). **Methods:** Patients with chronic rhinosinusitis who received FESS were recruited and randomly assigned to 2 groups at one month post-surgery. Patients in the xylitol group received 400ml of 5% xylitol nasal irrigation daily for 2 months, and those in the normal saline (NS) group received 400ml of NS nasal irrigation daily for 2 months. Before FESS as well as before and after nasal irrigation, sino-nasal symptoms were assessed by a 22-item Sino-Nasal Outcome Test questionnaire and patients received endoscopic examination, acoustic rhinometry, and smell tests. Bacterial culture was obtained from the middle meatus of all patients. **Results:** Sixty-three patients completed the study. Among them, 31 received xylitol irrigation, and 32 received NS irrigation. The olfactory threshold significantly decreased after xylitol irrigation as compared with that before irrigation ($p=0.031$), but bacterial culture rates were not different between 2 groups after irrigation. **Conclusion:** Our study showed that xylitol nasal irrigation improved patients' olfactory function more than NS irrigation in post-FESS care.



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Protocol summary: Treatment of rhinosinusitis with nasal polyposis with dupilumab and mepolizumab: A randomized, multi-centre, head-to-head comparison in real-world Danish patients

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Chronic Rhino-Sinusitis with Nasal Polyps (CRSwNP) is a common disease affecting 2-4% of the adult, Danish population. Up until recently, patients with severe CRSwNP disease has been treated with repeated surgeries and/or courses of systemic steroids, but very recently, two biologicals (mepolizumab and dupilumab) were approved for the treatment of severe nasal polyposis in Denmark. It is a highly effective, and very safe treatment. However, the cost of the drugs is high, so cost-effective use is imperative. Since biologicals have only been in use for this indication for a few years, studies investigating the effect (and side-effects) in real-life patient cohorts are relatively scarce, and none has so far directly compared mepolizumab and dupilumab in a randomized, controlled trial. In this presentation, we will present the protocol for our study which will be the world's first "head-to-head" RCT comparison of two of the most commonly used biologicals; mepolizumab and dupilumab. We expect our study will assist clinicians and policymakers in making cost-efficient decisions, which will ultimately benefit our patients with CRSwNP.

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Assessment of the Prevalence of the Use of Nasal Decongestants Among the General Population in Saudi Arabia

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Background A topical nasal decongestant (NDC) is widely prescribed in ENT practice and used as self-medication because it is available over the counter, which makes it an easily accessible medication. Due to its common and long-term use, it is associated with serious nasal complications. It is commonly self-administrated in many otolaryngology diseases like the common cold, sinusitis, and acute or chronic rhinitis. The long-term usage of nasal decongestants is associated with significantly increased side effects. **Aim** To assess the prevalence of the usage of nasal decongestants among the general population in Saudi Arabia and the pattern of its use. **Methodology** A questionnaire-based, cross-sectional survey was applied to level all available populations in Saudi Arabia. Participants with ages aged 10 to 60 years old in Saudi Arabia were invited to participate in the survey. Data were collected from participants using a predesigned online questionnaire. The questionnaire included the participant's demographic data, NDC use, and pattern of use. The questionnaire was uploaded online by researchers and their friends using social media platforms. **Results** A total of 1456 participants completed the study questionnaire. Participants ages ranged from 10 to 60 years with a mean age of 26.9 ± 12.4 years old. Exact 585 (40.2%) participants were males and 1270 (87.2%) were from urban regions. A total of 657 (45.1%) respondents reported using nasal decongestants while 799 (54.9%) did not use NDC. As for the duration of use, 70.8% used NDC for less than five days and 13.5% used it for 5-15 days. Th

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Effectiveness of Dupilumab in Severe Uncontrolled CRSwNP: A "Real-Life" Single Centre Observational Study

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Background: Dupilumab, whose efficacy and safety have been investigated in two multicenter phase 3 trials (LIBERTY NP SINUS-24/52), is indicated in patients with type-2 severe uncontrolled chronic rhinosinusitis with nasal polyps (CRSwNP). **Objective:** to evaluate the efficacy of dupilumab in a real-life setting, over a 12 month period. **Primary endpoints** were reduction in Nasal Polyp Score (NPS) and improvement in nasal obstruction, quality of life (SNOT-22), and olfactory function (SSIT-16). **Secondary endpoints** were disease control in terms of need for surgery and/or oral corticosteroids (OCS). **Methods:** a retrospective observational study including 27 patients with severe uncontrolled CRSwNP receiving dupilumab 300mg every two weeks with a regular follow up. At each visit, patients underwent nasal endoscopy, symptoms questionnaires and were evaluated on olfactory function and blood eosinophilia. **Results:** The population had signs of type 2 inflammation and a history of at least one previous surgery with polyps recurrence. During follow-up, we observed a statistically significant improvement in all primary endpoints, with the greatest response after 3 months of treatment in all objective scores and after 6 months in all symptoms scores. All secondary endpoints improved: increased ACT score among asthmatic patients, reduced need of OCS and surgery during the first year. **Conclusions:** Dupilumab was effective in reducing NPS, disease-related symptoms and overall quality of life, achieving most of the results in the first 3-6 months, while also reducing the need for OCS and surgery.



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Effect of oral steroids on olfactory function in Chronic Rhinosinusitis with Nasal Polyps

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Aim: The aim of this study is to investigate the effect of oral steroids on olfactory dysfunction in patients with CRSwNP. **Material and methods:** 140 selected CRSwNP patients, with hyposmia, were divided into two groups. Group A received a 7-day course of oral steroids with a 12-weeks course of nasal steroids and douching. Group B received a 12-weeks course of nasal steroids and douching. **Assessment** included Sniffin' Sticks scores, Visual Analogue Scale score for olfaction (VASsmell), Sinonasal Outcome Test-22, Greek-version (SNOT22-Gr) and Endoscopic Appearance Score (EAS). **Objectives:** The objective was to compare the olfactory effect of different therapy between groups at 2, 12 and 24 weeks. Accessory objectives included comparison of EAS and SNOT22-Gr between groups and evaluation of therapeutic outcome duration. **Results:** The 2-weeks evaluation showed a significant statistical difference ($P < 0.001$) for all parameters. Olfactory outcomes (Sniffin' Sticks and VASsmell scale scores) were found significantly better in-group A at the 24-weeks evaluation ($P < 0.001$). Within groups, the therapeutic result remained stable between the 12 and 24-weeks evaluation ($P > 0.05$). **Conclusion:** Our results suggest that a combination treatment of oral and nasal steroids in well-selected patients with CRSwNP may result in early olfaction restoration with a possible long-term effect.



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Sino-Nasal microbiome transplantation as treatment for CRSsNP

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Twenty-two patients diagnosed with CRSsNP who had failed previous medical and surgical treatment were recruited. The patients were treated with 13 days of antibiotics followed by 5 consecutive days of Sino-Nasal lavage transfer from healthy donors. Primary outcome measure was the 22-item Sino-Nasal Outcome Test (SNOT-22). Other Outcome measures included total nasal symptom score (TNSS), 16S ribosomal RNA (rRNA) next generation sequencing (microbiome analysis), endoscopic grading and nasal lavage fluid analysis of inflammatory cytokines. At the end of the study, 3 months after the transplant procedure, patients reported significantly reduced SNOT-22 scores and microbiome analysis showed significantly increased abundance and diversity compared to at inclusion. For TNSS and endoscopic grading no significant change was observed.



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Multidisciplinary management of patients with chronic rhinosinusitis with nasal polyps (CRSwNP) from the severe asthma service to the ENT office.

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The management of CRSwNP has evolved in recent years with the advent of biological treatments. On the other hand, the creation of united airway and severe asthma units have provided an improvement in the multidisciplinary management of patients with CRSwNP. As a result, specialized medical consultations have been created in order to evaluate and to follow-up patients with CRSwNP and biological treatment. The information comes from 3 hospital centers that have implemented this clinical agenda, pointing out the difficulties encountered and the strategies used. We aim to describe our experience in the management of CRSwNP patients from the severe asthma unit to the ENT practice.

Allergic Rhinitis 1

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Exacerbation of Allergic Inflammation by Inhalation of E-Cigarette Vapor via Cytokine Induction and MUC5AC/5B Expression in an OVA-Induced Murine Asthma Model

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Electronic cigarettes(e-cigarettes) have quickly surpassed traditional cigarettes. Although a few studies have shown that e-cigarette smoking is harmful in asthmatic patients, the effects of e-cigarettes vapor on inflammation and mucin secretion remain unclear. Therefore, this study investigated the effects of e-cigarette vapor on allergic inflammation, cytokine production, and MUC5AC/5B expression in murine asthma models. Wild-type BALB/c mice were randomized into the following four groups: control, e-cigarette exposure, ovalbumin(OVA) sensitization, and e-cigarette-exposed OVA sensitization groups. The infiltration of inflammatory cells was counted based on their microscopic morphology in BAL fluid. Gene expression of mucin was assessed by real-time PCR. Production of inflammatory cytokines in BAL fluid and protein production of mucin in bronchial tissues were investigated by ELISA. Airway hyperresponsiveness was significantly higher in the e-cigarette-exposed OVA sensitization group than in the other groups. The e-cigarette-exposed OVA sensitization group showed significantly greater infiltration of inflammatory cells and the cytokines compared to the other groups. MUC5AC mucin levels were significantly elevated except control group, whereas MUC5B mucin levels were significantly elevated in the OVA sensitization and e-cigarette-exposed OVA sensitization groups. The results may suggest that the exposure to e-cigarette vapor in an OVA-induced murine asthma model promoted allergic inflammation and increased mucin secretion, ultimately leading to the exacerbation of asthma.

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Impact of Allergic Rhinitis and Asthma on COVID-19 Infection, Hospitalization, and Mortality

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Allergic Rhinitis 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Background: It remains unclear if patients with allergic rhinitis (AR) and/or asthma are susceptible to corona virus disease 2019 (COVID-19) infection, severity, and mortality. **Objective:** To investigate the role of AR and/or asthma in COVID-19 infection, severity, and mortality, and assess whether long-term AR and/or asthma medications affected the outcomes of COVID-19. **Methods:** Demographic and clinical data of 70,557 adult participants completed SARS-CoV-2 testing between March 16 and December 31, 2020, in the UK Biobank were analyzed. The rates of COVID-19 infection, hospitalization, and mortality in relation to pre-existing AR and/or asthma were assessed based on adjusted generalized linear models. We further analyzed the impact of long-term AR and/or asthma medications on the risk of COVID-19 hospitalization and mortality. **Results:** Patients with AR of all ages had lower positive rates of SARS-CoV-2 tests (relative risk [RR]: 0.75, 95% confidence interval [CI]: 0.69-0.81, $P < .001$), with lower susceptibility in males (RR: 0.74, 95% CI: 0.65-0.85, $P < .001$) than females (RR: 0.8, 95% CI: 0.72-0.9, $P < .001$). However, similar effects of asthma against COVID-19 hospitalization were only major in participants aged <5 (RR: 0.93, 95% CI: 0.86-1, $P = .044$) instead of elderlies. In contrast, patients with asthma tested positively had higher risk of hospitalization (RR: 1.42, 95% CI: 1.32-1.54, $P < .001$). Neither AR nor asthma had an impact on COVID-19 mortality. None of conventional medications for AR or asthma, for example, antihistamines, corticosteroids, or β_2 adrenoceptor agonists, showed association with COVID-19 infection or severity. **Conclusion:** AR (all ages) and asthma (aged <5) act as protective factors against COVID-19 infection, whereas asthma increases risk for COVID-19 hospitalization. None of the long-term medications had a significant association with infection, severity, and mortality of COVID-19 among patients with AR and/or asthma.

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Underwater posterior nasal neurectomy compared to resection of peripheral branches of posterior nerve in severe allergic rhinitis

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Background: Several surgical procedures for posterior nasal neurectomy have been reported, but no conclusion has been reached about which procedure is best. **Objectives:** The aim is to evaluate the improvement in symptom medication scores for resection of the posterior nasal nerve trunk in an underwater environment, with submucous inferior turbinectomy, without injuring the sphenopalatine artery (SPA) in severe allergic rhinitis. **Material and Methods:** Improvements in symptom medication scores were retrospectively compared between 27 consecutive cases who underwent resection of the posterior nasal nerve trunk with turbinoplasty in an underwater environment without injuring the SPA (Underwater group) and, as a historical control, 16 consecutive cases who underwent resection of peripheral branches of the posterior nasal nerve with turbinoplasty (Control group). **Results:** The improvements in symptom medication scores in the Underwater group were significantly better than in the Control group (3.07 vs. 1.96, $p = 0.02$). **Conclusions:** By using underwater posterior nasal neurectomy, we can easily and safely resect the posterior nasal nerve trunk under a clear surgical view without injuring the SPA. This technique with submucous inferior turbinectomy may, more than resection of peripheral branches of the posterior nasal nerve, be able to reduce the medication score and symptom medication score.



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Local allergic rhinitis induced by unilateral intranasal instillation of ragweed pollen extract and intraperitoneal injection of FTY720 in mice

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Allergic Rhinitis 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Local allergic rhinitis (LAR) is a localized nasal allergic response in the absence of systemic responses characterized by local production of antigen-specific IgE in nasal mucosa. In the present study, we induced local allergic responses in nasal mucosa of Balb/c mice by unilateral intranasal instillations of ragweed pollen extract and by intraperitoneal injections of FTY720, which suppresses lymph node function. Intranasal and intraperitoneal injections were given for 14 days in every 2 weeks, and nose-associated lymphoid tissue (NALT), cervical lymph nodes (cLN), and serum were collected at day 14, 42, and 72. The results showed that sneezing frequency increased from day 14 and increased further with non-nasal antigen stimulation on day 70, but did not change with FTY720 administration. Ragweed-specific IgE antibodies in the serum increased on day 70 and were suppressed by FTY720, while the production of IL-5 and IL-13 in response to ragweed antigen stimulation was also suppressed by FTY720. On day 70, Tfh cells and Th2 cells increased in NALT and cLN, but administration of FTY720 did not change their levels in cLN. These results indicate that the sensitization with ragweed pollen induced local allergic responses and a sneezing symptom in LAR mouse model.

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Mode of delivery and risk of allergic rhinitis: A systematic review and meta-analysis

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Allergic Rhinitis 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Background Different modes of delivery can influence infant microbial diversity, cause immune dysregulation, and potentially increase the risk of allergic rhinitis (AR). **Methods** We systematically sought five electronic databases from inception until 03 November 2022. Human observational studies were included. The primary comparison was vaginal (VD) versus cesarean delivery (CD). Secondary comparisons were specified CD (elective, emergency) versus VD, CD versus specified VD (spontaneous, abnormal), and non-microbiota-exposed versus microbiota-exposed delivery. The outcome was risks of AR later in life presented as odd ratios (OR) and 95% confidence interval. Subgroup analyses were performed to explore the potential confounders, including region, study design, affluence of country, age of outcome, definition of AR, exclusion of prematurity, available OR, and cesarean rate. **Results** Thirty-four studies were included. Compared to VD, CS and its specified subgroups were associated with a higher risk of developing AR. Compared to CD, spontaneous VD lowered the likelihood of AR but not abnormal VD. There was no significant difference in the likelihood of AR between the non-microbiota-exposed and microbiota-exposed delivery populations. Potential confounders were region and exclusion of prematurity. **Conclusion** Most estimated ORs were consistent with a positive association between CD and AR. Early-life environmental exposures that affect microbial colonization may influence allergic risks.



1302

The Unified Airway: The Link between Allergic Rhinitis and Asthma

ABDULRHMAN ALFAYEZ¹

¹KAMC

Allergic Rhinitis 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

The Unified Airway: The Link between Allergic Rhinitis and Asthma

Dr. Abdulrhman Alfayez

Objectives: -

- Recognize the similar pathophysiologic features of allergy and asthma
- Understand the epidemiologic relationship of asthma and rhinitis
- Describe the concept of the "Unified Airway" "One Airway, One Disease"

Asthma and allergic rhinitis increasingly viewed as a continuum of disease involving one common airway

- Allergic rhinitis in patients with less severe disease
- Asthma in patients with more severe disease

• Concept of "one airway, one disease" gaining greater acceptance

Asthma and Rhinitis: -

- Epidemiological, pathophysiological, and clinical studies, suggest a relationship between rhinitis and asthma
- Upper and lower airways may be influenced by a common inflammatory process that is sustained and amplified by interconnected mechanisms
- "When considering a diagnosis of rhinitis or asthma, and evaluation of both the lower and upper airways should be made"

Conclusion: -

- Asthma and rhinitis often co-exist
- AR associated with, and risk factor for asthma
- Rhinitis and asthma have same triggers
- Rhinitis often precedes development of asthma
- Patients with AR should be evaluated for asthma and vice versa
- Prevention or early treatment of AR - May prevent occurrence of asthma - May limit severity of bronchial symptoms

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Nutritional Role in Allergic Rhinitis.

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Allergic Rhinitis 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Objectives: This research is aimed to study the relationship between allergic rhinitis and nutritional deficiencies in Saudi Arabia. **Method:** A prospective clinical observational cross-sectional study was conducted at the Otolaryngology department of a secondary hospital in Saudi Arabia. The study was approved by the ethics and research committee. Statistical analysis was performed using the SPSS software. A p-value of <0.05 was considered significant. **Results:** Total of 40 patients, age range between 18-65 years with a mean of 39.5 years. Bronchial asthma was found in 13 (32.5%) patients, eczema in 7 (17.5%), chronic rhinosinusitis with nasal polyps in 15 (37.5%) patients, and allergic fungal rhinosinusitis in 3 (7.5%) patients. Out of 40 patients with allergic rhinitis, 13 (32.5%) were experiencing mild symptoms and 27 (67.5%) were having moderate to severe symptoms. Laboratory investigations showed that 37% of patients had elevated total IgE level, 2.5% had folate deficiency, 12.5% had low vitamin B12, 25% of patients with low ferritin level, and 92.5% had low vitamin D (<0ng/ml) which was significantly associated with more persistent symptoms and severe form AR (p-value = 0.046). **Conclusion:** Despite the presence of many studies, conflicting data still exists and the extent of impact on immune system is not fully elucidated. Studies with larger sample sizes are mandatory in order to help in the understanding of pathogenesis and subsequent management of such disease.



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The Effects of Fexofenadine/Pseudoephedrine combination tablet on Nasal Obstruction in Patients with Allergic Rhinitis using Rhinomanometry

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Allergic Rhinitis 1 | Room 8 Hall 4 - Level 0 | Monday 19/06/2023

Background: A Fexofenadine/Pseudoephedrine combination tablet (F/P) is a novel product containing fexofenadine hydrochloride, a histamine H1-receptor antagonist for sneezing and rhinorrhea and pseudoephedrine hydrochloride, an α adrenergic agonist for nasal obstruction. The effect to the nasal obstruction of the F/P is confirmed empirically. In the present study, we estimated the efficacy of the F/P on nasal obstruction for patients with allergic rhinitis to compare with the Fexofenadine (F) objectively. **Method:** Twenty four subjects (13 males and 11 females, aged 18-56 years) with perennial allergic rhinitis were recruited for the study. A randomised study was performed testing F/P versus F. Nasal airflow was recorded at 30 minute intervals for 8 hours after dosing as a single drug therapy. **Result:** Subjects' mean age was 31.1 years, no difference between the two groups. The onset of action of F/P was 1.0 hour, significant improvement in nasal airflow from baseline was detected with the mean change of 51.8 cm³/s (90% CI, 15.5-88.1; p=0.031). F/P showed significant differences in the following changes, while F did not show throughout the study. **Conclusion:** In this study, we found out that F/P is effective about an immediate effect and the continuation to nasal obstruction of perennial allergic rhinitis.



Rhinology – Miscellaneous 1

1608

A prospective multicentre study investigating the influence of simulation on competence in performing flexible nasendoscopy (FNE), nasal cautery (NC) and nasal packing (NP).

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Rhinology – Miscellaneous 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Background: Performing FNE, NC and NP is not well assessed in medical school. This study uses qualitative and quantitative methodology in assessing how simulation and the workplace may influence competence in performing FNE, NC and NP amongst junior doctors new to ENT, and the change 1 month into clinical work. Methods: Junior doctors newly rotating to ENT from 6 hospitals in the East of England were given simulation based training on FNE, NC and NP. Intercollegiate Surgical Curriculum Programme (ISCP) skill levels and reflections on learning were self-assessed and trainer assessed pre- post- and 1+month after simulation. Reflective data was analysed using NVIVO software. Results: ISCP levels significantly increased overall ($p < 0.05$) for all participants ($n = 14$). Between simulation and 1+month there was further significant improvement for NC and FNE, but not NP. Themes beyond the simulation include early references to videos and resources for learning, more observation, supervised practice, fear of causing harm, and identifying normal v. pathology. Conclusion: Simulation rapidly improves competence in FNE, NC and NP amongst those with no prior ENT experience. Factors such as repeated exposure in simulation, minimising fear of causing harm and use of picture quizzes could be considered in augmenting future training.

1140

Chronic rhinosinusitis with nasal polyps and its management

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Rhinology – Miscellaneous 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Chronic rhinosinusitis with nasal polyps (CRSwNP) is a predominantly type 2 inflammation-mediated disease of the nasal mucosa and paranasal sinuses with an under-recognized clinical, humanistic, and economic burden. According to the latest EPOS guidelines, CRSwNP should be regarded as primary or secondary with distinction between diffuse and localized disease. Endo typing of inflammatory process is the primary aim to define prominent inflammatory process differentiation between type 2 versus non type 2, Especially endo type T cells which contribute innate and adoptive immune system response in type 2 inflammation. The ENT surgeons can investigate nasal secretions for eosinophilia as a guide to likely T2 inflammation and its corticosteroid responsiveness. a high symptom burden, including nasal congestion, loss of smell, and rhinorrhea, which has a negative impact on physical and mental health-related quality of life, including sleep quality. Treatment is directed at enhancing mucociliary clearance, improving sinus drainage/outflow, eradicating local infection and inflammation, and improving access for topical medications. Because type 2 inflammation is implicated in the pathogenesis of several coexisting diseases, patients with CRSwNP often have comorbid asthma and/or nonsteroidal anti-inflammatory drug-exacerbated respiratory disease. These patients, as well as those with high corticosteroid use and/or Sino nasal surgical history, have more severe disease and associated symptom burden and represent a difficult-to-treat population under the existing management paradigm. This article reviews the clinical, humanistic, and economic burden of CRSwNP; it highlights the unmet need for effective and safe CRSwNP therapies that effectively control symptoms and minimize recurrence by targeting the underlying type 2 inflammatory disease pathophysiology.



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Osteomalacia due to rare nasal tumor: case report and literature review

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Rhinology – Miscellaneous 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Phosphaturic mesenchymal tumor (PMT) is a rare neoplasm of soft and bone tissue producing fibroblast growth factor 23 (FGF23), which leads to oncogenic osteomalacia. The most common localization is the extremities and only 5% occurs in the head and neck region. Accurate diagnosis is often delayed due to non-specific pathological changes and symptoms. Laboratory abnormalities such as hypophosphatemia and hyperphosphaturia, high alkaline phosphatase level together with osteomalacia-related symptoms could raise suspicion of PMT. We present a case of a 44-year-old male who presented with progressive symptoms of osteomalacia for almost 2 years and was found to have a nasal cavity mass. The patient's symptoms and laboratory changes resolved upon total resection of the tumor.



1185

Extreme weather conditions influence the frequency of rhinology-related emergency room visits

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Rhinology – Miscellaneous 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Background: Global climate change increases the frequency of extreme weather events, which directly and indirectly affects human health. This study aims to analyze the impact of extreme weather events on rhinology emergencies. **Methodology:** 3091 rhinology-related emergencies at the Vienna General Hospital between 2015 and 2018 were analyzed. A non-linear distributed lag model was calculated to investigate the cumulative relative risk (cRR) for rhinology emergencies after extreme weather events. The cRR is defined as the risk of a rhinology-EV in extreme weather conditions (<5th or >95th percentile) compared to the risk in median weather conditions (50th percentile) within a given period. **Results:** At a mean daily temperature of 27°C, the cRR for epistaxis-related EV doubled on day 1. At a relative humidity of 39%, epistaxis-cRR was highest on day 3, with an increase of 59%, while extremely high humidity (92%) led to a 30% decrease on day 1. Intense precipitation of 24mm reduced epistaxis-cRR on day 3 by 62%. Similarly, extremely high wind speed (5.9m/s) doubled the cRR for acute sinusitis on day 4, while extremely low atmospheric pressure (983hPa) increased the cRR by 14% on day 8. **Conclusions:** Extreme weather conditions significantly impact the cRR for rhinology-related EVs.

1217

Health Utility Score of Thai Patients with Chronic Rhinosinusitis: Pre and Postoperative Analyses

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Rhinology – Miscellaneous 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Background: The health utility score (HUS) is a key component of cost-effectiveness analysis. There is no prior measurement of the HUS in patients with chronic rhinosinusitis (CRS) in Thailand or other Asian countries. The objective was to evaluate the HUS of patients with CRS before and after endoscopic sinus surgery (ESS). **Methods:** Thai patients (age ≥ 18) with CRS who about to undergo ESS were enrolled. Patients with underlying diseases other than allergic rhinitis and asthma were excluded. The preoperative demographics, quality of life (QoL), endoscopic, and CT scores were recorded. This cohort of patients was interviewed with the EuroQoL-5-Dimensions-5 levels (EQ-5D-5L), EuroQoL visual analog scale (EQ-VAS), Standard gamble (SG), and Time trade-off (TTO) method at the preoperative and postoperative time-points (3, 6 months). **Results:** A total of 60 patients were in the final analysis. The mean preoperative HUS was 0.75, 0.65, 0.79, 0.85 by EQ-5D-5L, EQ-VAS, SG, and TTO, respectively. At 3- and 6-months post-ESS, the score was significantly improved to 0.96, 0.91, 0.96, 0.97, and 0.97, 0.92, 0.97, 0.98 by EQ-5D-5L, EQ-VAS, SG, and TTO, respectively. The ESS raised the HUS by 0.12-0.27. Among 4 measurements of HUS, the EQ-VAS yielded significantly lower scores than other methods at all time points. **Conclusion:** The preoperative HUS of Thai patients with CRS ranged from about 0.65-0.85 and improved significantly to 0.92-0.98 at both 3- and 6-months post-ESS. The EQ-VAS yielded a significantly lower value than other methods at all time points.

**1292****Trends in Level of Evidence in Rhinology Research**

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Rhinology – Miscellaneous 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Background: Evidence-based medicine is an integral part of clinical research and practice. The purpose of this study was to assess the trends in the level of evidence in leading Rhinology journals in recent years. Methods: All scientific articles within the field of Rhinology published in The Laryngoscope, Rhinology, American Journal of Rhinology and Allergy, Otolaryngology–Head and Neck Surgery, and Journal of Otolaryngology – Head and Neck Surgery from 2010, 2014, and 2018 were rated for level of evidence. The number of authors, patient age, study type, sample size, and presence of p-values were also noted. Results: Of 998 articles reviewed, 71.1% were clinical with 58.3% being treatment studies. Overall, there was an increase in the average level of evidence of articles published from 2010 to 2018. However, the number of articles containing level 1 or 2 evidence remains low. Conclusions: With the increased demand for evidence-based medicine, rhinology literature has seen an overall increase in the quantity of higher-level evidence research published. However, articles representing level 1 and 2 evidence remain rare. The authors hope that this information may help encourage further high-quality research in rhinology.

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Polymyxin B and ethylenediaminetetraacetic acid act synergistically against *Pseudomonas aeruginosa* and *Staphylococcus aureus*

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Rhinology – Miscellaneous 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Background: In cystic fibrosis (CF), upper and lower airway colonisation with *Staphylococcus aureus* and *Pseudomonas aeruginosa* biofilms is common but difficult to treat. Polymyxin B and ethylenediaminetetraacetic acid (EDTA) have related mechanisms of action and may exhibit synergy. This in vitro study investigated this potential synergy and their antibiofilm efficacy in combination. **Methods:** Synergy was assessed against planktonic *S. aureus* and *P. aeruginosa* type strains using checkerboard assays. Minimum biofilm eradication concentration (MBEC) assays were performed for each agent alone and in combination. The median combination MBEC of the type strain was tested against biofilms of ten *P. aeruginosa* clinical isolates from patients with CF. **Results:** Synergy was confirmed against planktonic *S. aureus* (FICI 0.44, FBCI 0.56) and *P. aeruginosa* (FICI 0.39, FBCI 0.39), and biofilms of *P. aeruginosa* (FBCIb 0.38). *P. aeruginosa* biofilm was eradicated at 8 µg/mL polymyxin B and 16.9 mg/mL EDTA. Nine clinical *P. aeruginosa* isolates were comparable or more susceptible than the type strain. *S. aureus* biofilms were not eradicated at clinically achievable concentrations. **Conclusion:** Polymyxin B and EDTA act synergistically against both species in planktonic form. Synergy against *P. aeruginosa* biofilms may be useful for enhancing treatments for CF.



1365

Assessment of autonomic dysfunction in the patients with nasal septal deviation (NSD) using Composite Autonomic Symptom Scale-31 (COMPASS-31)

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Rhinology – Miscellaneous 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

COMPASS-31 is a well-validated instrument by which one can evaluate autonomic dysfunction. NSD is a remarkably prevalent condition where the severity and the deviation do not correlate with subjective breathing difficulty. Here we hypothesized that symptomatic NSD might have underlying autonomic dysfunction. COMPASS-31 questionnaires were collected from 41 asymptomatic NSD (aNSD) and 279 symptomatic NSD (sNSD) patients at Asan Medical Center from May 2022 to January 2023. Patients with empty nose syndrome, allergic rhinitis, chronic rhinosinusitis, or history of nasal surgery were excluded. Finally, 23 aNSD and 86 sNSD patients were enrolled. NSD was diagnosed at outpatient clinic, and patients with nasal obstruction were defined as sNSD patients. COMPASS-31 scores were compared between aNSD and sNSD patients. The average scores of secretomotor and bladder domains of aNSD were 1.04, and 0.43, respectively. In contrast, the average scores of secretomotor and bladder domains of sNSD patients were 1.76, and 1.20, respectively; those values all were significantly higher ($p < 0.05$) in the sNSD group, which implies that sNSD group patients have altered autonomic function. The mean total COMPASS-31 scores were 12.74 and 18.74 for aNSD and sNSD patients respectively, and the difference was significant ($p < 0.05$). Among various symptoms suggestive of autonomic dysfunction, the frequency of urinary retention was significantly higher in sNSD group ($p < 0.05$). In conclusion, Autonomic dysfunction may underlie the subjective perception of breathing difficulty in sNSD patients.



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The role of adenoidectomy in the surgical treatment of nasal obstruction in adults

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Rhinology – Miscellaneous 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Background: Nasal obstruction is a common complaint in patients, treated in an ENT practice. Some of the most common surgical procedures to treat nasal obstruction include septoplasty and/or turbinate reduction. In recent years a higher incidence of abnormal adenoid hypertrophy in adults is observed, sometimes as the only significant finding during ENT examination. Methodology: 30 adult patients with complaints of nasal obstruction and confirmed adenoid hypertrophy underwent cold steel adenoidectomy under endoscopic control at ENT Department UMHAT Pulmed. Septoplasty and/or turbinate reduction were also performed in cases where this was considered necessary. Preoperative examination included thorough medical history and ENT examination, nasal endoscopy, CT and biopsy of the nasopharyngeal mass to exclude a neoplasm. PNIF was measured and a self-evaluation questionnaire was given to all patients preoperatively and on 7-day and 1-month follow up visits to determine the outcome. Results: Significant improvement in the PNIF scores and self-evaluation questionnaire results in most cases after adenoidectomy as only treatment or as part of a combo procedure including turbinate reduction and/or septoplasty. Conclusions: Adenoidectomy needs to be considered among the surgical options in cases of nasal obstruction, where adenoid hypertrophy is confirmed.



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Extracranial nasoseptal arteriovenous malformation : An unusual case report with multidisciplinary management

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Rhinology – Miscellaneous 1 | Room 9 Olympic Hall - Level 0 | Monday 19/06/2023

Extracranial nasoseptal arteriovenous malformations (AVMs) are high-flow congenital vascular anomalies. They are composed of a complex system of vessels directly connecting feeding arteries to draining veins forming a nidus. They may be potentially life-threatening due to progressive symptoms and infiltrative disease. Extracranial AVMs most commonly affect the head and neck area (47.4%). AVMs are best characterized as being either focal or diffuse. The management of AVMs includes conventional surgery and endovascular techniques. Recently, a combination of embolization and surgical resection has become the treatment of choice. We report a rare case of a 26-year old female patient who admitted to our head and neck surgery department with complainants of recurrent epistaxis from the right nostril in the past two weeks from the hospitalization. We managed the embolization with collaboration of colleagues from interventional neuroradiology department of our university. We will discuss the management of nasoseptal AVMs from the aspect of ENT emergency care. Furthermore we will respectively talk over the following steps of our treatment plan.

Skull base surgery 1

1150

The Role of Tissue Sealants for Skull Base Reconstruction Following Endoscopic Endonasal Surgery: A Systematic Review and Meta-Analysis

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Skull base surgery 1 | Room 10 Peroto - Level 0 | Monday 19/06/2023

Background: Despite significant advances in understanding of skull base reconstruction principles, controversy remains regarding the role of adjunctive sealants in the modification of postoperative cerebrospinal fluid (CSF) leak outcomes. The objective of this study is to systematically evaluate rates of postoperative CSF leak associated with the use of tissue sealants for the repair of skull base defects during endoscopic endonasal surgery. **Methods:** Systematic review and meta-analysis of risk differences (RD). A search encompassing four databases identified original studies reporting postoperative CSF leakage after endoscopic skull base reconstruction disaggregated based on tissue sealant use and/or type. **Results:** The search yielded 2,466 unique studies, of which 27 non-randomized studies (n=2,403) were included for qualitative and meta-analysis. Reconstruction with a single tissue sealant did not significantly reduce risk of postoperative CSF leak compared to reconstruction without sealant (RD[95% CI] = 0.02[-0.01, 0.06]). Sub-analyses of dural sealant (-0.02[-0.11, 0.07]) and fibrin glue cohorts (0.01[-0.06, 0.08]) compared to no sealant cohorts, as well as analyses comparing specific sealants/glues, similarly demonstrated no difference in outcomes. **Conclusion:** No tissue sealant reduced postoperative CSF leak incidence when compared to nonuse, with also no differences noted for outcomes based on sealant type. Prospective randomized studies are warranted to thoroughly elucidate the clinical value of adjunct sealant use in endoscopic skull base reconstruction



1184

Anterior skull base schwannomas: case study and systemic review

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Skull base surgery 1 | Room 10 Peroto - Level 0 | Monday 19/06/2023

We present a rare clinical case - a 20-year-old female patient who complained about left-sided nasal congestion, severe headaches, and recurrent left-sided sinusitis. After the execution of radiological examinations and biopsy, a rare tumor of anterior skull base that has grown into the nasal cavity - olfactory schwannoma - was diagnosed. Expanded endoscopic endonasal transcribriform approach for resection of anterior skull base olfactory schwannoma was performed with a multi-layer reconstruction of the skull base. In the report, we will discuss this clinical case, review the problems of this topic, and provide a systematic review of the literature.

1333

Technical Factors in Endoscopic Skull Base Surgery Associated with Reconstructive Success: A Multicenter Observational Study

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Skull base surgery 1 | Room 10 Peroto - Level 0 | Monday 19/06/2023

Introduction: Since the advent of endoscopic skull base surgery (ESBS), advancements in technologies and surgical techniques have enabled a broad range of strategies for reconstructing skull base defects. In this study, we aimed to identify key technical factors that may be independently associated with primary reconstructive success in ESBS. **Methods:** ESBS cases with intraoperative cerebrospinal fluid (CSF) leaks at four tertiary academic rhinology centers were retrospectively reviewed. Multivariate logistic regression was conducted to identify factors associated with postoperative CSF leak by subsite (anterior cranial fossa [ACF], suprasellar [SS], sellar, posterior cranial fossa [PCF]). **Results:** 706 patients (50% female) were analyzed. 62% patients had pituitary adenomas, 73% had sellar/SS defects, and 21% had high-flow intraoperative CSF leaks. The average defect size was 3.3 ± 2.2 cm². The postoperative CSF leak rate was 7.8%. On multivariate analysis, larger defect size (OR 1.00; $p=0.049$) predicted ACF postoperative leaks; use of rigid reconstruction (OR 0.13; $p=0.008$) and dissolvable nasal packing (OR 0.27; $p=0.014$) protected against SS postoperative leaks; BMI predicted sellar postoperative leaks (OR 1.17; $p=0.042$); and there were no predictors of PCF leaks. Leak flow rate, onlay type (autologous vs synthetic), vascularized flap use, and lumbar drainage were not associated with postoperative leaks (all $p>0.05$). **Conclusions:** Reconstructive success following ESBS may be influenced by patient and technical factors, which appear to differ by subsite.



1362

Olfactory function after repair of meningoceles of the olfactory cleft

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Skull base surgery 1 | Room 10 Peroto - Level 0 | Monday 19/06/2023

INTRODUCTION Meningoceles are one cause of CSF leakage and they occur often in the olfactory cleft. Surgical closure is required to avoid ascending infections with potentially lethal outcome. The aim of this study is to evaluate the olfactory function side by side in patients before and after repair of meningoceles of the olfactory cleft. **METHODS** The study was performed in the University Hospital of Geneva. We performed Sniffin' Sticks (threshold, discrimination and identification) before and 1 year after repair of meningoceles of the olfactory cleft. The test was performed side by side. **RESULTS** 8 Patients with confirmed meningoceles of the olfactory cleft were included. For 7 patients the etiology of the meningocele was idiopathic and for 1 patient an idiopathic intracranial hypertension. The results show that the TDI score is significantly lower in the affected side ($p=0.0312$). After operation, TDI score is not significantly different (before surgery mean=26.83; after surgery mean=23.25). **CONCLUSION** The olfaction function of the affected side is usually lowered before surgery and may be an additional element to find the concerned side in intractable CSF leakage. Our data further suggest that olfactory function can be preserved after repair of meningoceles of the olfactory cleft.



1439

Skull base and brain radionecrosis from a series of 383 patients treated for sinonasal and nasopharyngeal cancers: analysis of prognosticators and outcomes

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Skull base surgery 1 | Room 10 Peroto - Level 0 | Monday 19/06/2023

Radiotherapy (RT) is an essential part of the treatment of sinonasal and nasopharyngeal malignancies. One of its most severe complications is skull base and brain radiation-induced necrosis. A retrospective analysis was conducted on 383 patients who received RT, either in the form of Intensity-Modulated Particle Therapy (IMPT) or Intensity-Modulated Radiation Therapy (IMRT), for malignancies of the sinonasal tract, skull base and nasopharynx from April 2010 to April 2022 at the Otolaryngology department of the University of Insubria in Varese. Patients who developed radiation-induced necrosis (44 cases, 11.5%) did not experience a reduction in Overall Survival (OS). Univariate and multivariate analysis showed that patients treated with IMPT were at significantly higher risk of developing radiation-induced necrosis than patients treated with conventional radiations ($p < 0.0005$ each). In conclusion, skull base radionecrosis is a severe complication that must be properly and timely identified and, potentially, treated. Despite this adverse event, IMPT still remains an effective option for the treatment of radioresistant tumors and for previously irradiated patients. Special attention must be paid in case of internal carotid artery involvement, since this might be associated with life-threatening evolutions, such as arterial blow-out.

1469

Wide resection of extradural skull base lesions requiring sacrifice of internal carotid artery : Preliminary surgical outcome at a single medical center

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Objectives: To evaluate our preliminary surgical outcome of extradural skull base lesions requiring sacrifice of ICA. **Methods:** Retrospective review of patients was performed for those who underwent endoscopic radical resection of extradural skull base lesion invading the ICA. Pathologies, management of ICA, and surgical outcome including disease progression, improvements of symptom, and survival were evaluated. **Results:** Eleven cases (mean age 61.7 years) were collected. Pathologies were osteoradionecrosis (ORN) (N=7), ORN combined with malignancy (N=3), and malignancy without ORN (N=1). ICAs were managed as follows; spontaneous ICA occlusion (N=3), occluded intentionally (pre-operative embolization or intra-op planned ligation) (N=5), and extracranial to intracranial bypass surgery (N=3). Mean duration of follow up was 20 months (range 3-56 months). After radical resection, severe headache decreased from 72.7% to 17.2%. However, cranial nerve palsy was increased from 72.7% to 81.8%. There were 3 cases of disease progression and eventual death. Among them 2 had uncontrolled cancer regrowth and the other developed brain stem necrosis after adjuvant radiotherapy. The 2-year progression free survival was 71.6%. All the patients without disease progression (N=8) were alive and showed acceptable functional outcome with ECOG performance below 1. **Conclusion:** Radical resection of the skull base lesion invading ICA can be performed with no peri-operative mortality. Depending on the disease pathology, good surgical outcome with acceptable social performance can be expected.



1591

Transnasal intracranial aneurisms clipping with four hands technique - our experience.

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Transnasal skull base surgery is widely accepted nowadays, but is it not very often performed for cerebral arteries aneurisms clipping. The reasons include technical challenges, anatomical issues, high intraoperative risks and need for highly experienced skull base team to perform four-hands surgery. We present 3 cases of successful transsphenoidal clipping of arterial aneurisms - one was located at the base on basilar artery in low clivus, one was located at the apex of basilar artery and the last - at the paraclival segment of the internal carotid artery (ICA). The were no intraoperative complications. One patient developed trombembolia of pulmonary artery on the 3d postoperative day, which recovered completely. There were no CSF-leak or any other complications of the surgeries. Postoperative postcontrast CT showed complete occlusion of the aneurysms in all the patients. Conclusion: transnasal clipping of intracranial aneurisms using four-hand technique is a reliable method in highly selected cases.



1627

Multiple Various Approaches of Transoral Endoscopic Skull Base Surgery: A Literature Review

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Objective: This compare-and-contrast study aims to illustrate four significant types of endoscopic transoral approaches to skull base tumors by analyzing the works of literature respectively and demonstrating the anatomical structure combined with our clinical research. **Methods:** Combining basic research and clinical practice, we searched seven MEDLINE platforms, including CNKI, Wanfang Data Knowledge Service Platform, VIP, PubMed, ProQuest, Ovid, and Web of Science, to categorize and conclude diverse transoral approaches retrospectively. We reviewed the anatomy, exposure area, surgical freedom, manipulation distance, and angle of different transoral endoscopic skull base surgeries to provide a brief literature review. **Results:** Four major transoral approaches to the skull base tumors, including endoscopic-assisted transoral-transpharyngeal approach, endoscopic endonasal infratemporal fossa (ITF) approach, transvestibular transmaxillary approach, and trans the posterior wall of the oropharynx, are used widely according to the literature. Nevertheless, selecting the appropriate transoral approach for skull base tumors remains an issue. **Conclusion:** The endoscopic transoral approach provides better visualization and handling of delicate tissue in a narrow space. Though the endoscopic endonasal approach (EEA) to the skull base has been widely used to treat skull base tumors, EEA is inadequate when an inferolateral tumoral extension is present. Furthermore, endoscopy permits a more meticulous and precise dissection and thus allows adequate and safer transoral surgeries.



Best Poster Session

1209

Phase I study of LP-003, a novel high-affinity, long-acting anti-IgE antibody for allergic rhinitis

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Best Poster Session | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Background: Allergic rhinitis (AR) affects large population. Omalizumab was approved for the severe AR patient can't be adequately controlled by the current standard medication. In this study, a new anti-IgE antibody with high affinity, stronger efficacy (FcεRI inhibition) and longer half-life is investigated. **Methods:** A randomized, double-blind, single-ascending-dose Phase I clinical study (CTR20221413) was conducted. 32 healthy subjects were randomly divided into five groups to receive a single intravenous dose of 0.3 mg/kg, 1 mg/kg, 3 mg/kg, 6 mg/kg and 10 mg/kg respectively. Safety, pharmacokinetics, and pharmacodynamics (free IgE levels) profile was evaluated. **Results:** LP-003 has affinity to IgE of 2.08 pM, which is comparable to Ligelizumab (0.66 pM) and more than 100-fold higher than Omalizumab (1730 pM). LP-003 also shows stronger inhibition to FcεRI compared to Omalizumab and Ligelizumab using allergic patient's serum. In SAD of phase I study, LP-003 exhibited a non-linear PK characteristic with T_{1/2} ranging from 10.6 days to 83.5 days, which is approximately 2 fold of Omalizumab. Moreover, the free-IgE was suppressed to below detection range for more than 133 days at 1 mg/Kg group (except one with high baseline IgE level) to 10 mg/Kg group. LP-003 demonstrated a favorable safety profile with no treatment-related SAE, and no TEAE leading to discontinuation of the study. **Conclusion:** The pre-clinical and SAD of phase I study of LP-003 suggests that this novel high affinity and long-acting anti-IgE antibody with good safety profile renders a promising option in AR treatment.

1261

Evaluating treatment responses of dupilumab versus omalizumab in severe chronic rhinosinusitis with nasal polyps and comorbid asthma patients: the EVEREST trial

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Background: Dupilumab and Omalizumab are approved for the treatment of uncontrolled Chronic Rhinosinusitis with Nasal Polyps (CRSwNP) and asthma. Comparison studies can contribute to evidence-based decision making. **Methods:** EVEREST (NCT04998604) is a phase-4, multicenter, randomized (1:1), double-blind study comparing dupilumab (300mg Q2W) vs. omalizumab (75-600mg Q2W) add-on to nasal corticosteroid therapy. Approximately 422 adult CRSwNP patients, with nasal congestion, loss of smell, NP score ≥ 5 , coexisting asthma, receiving low/medium/high-dose inhaled corticosteroids and a second controller, with an Asthma Control Questionnaire (ACQ)-5 score ≥ 1.5 , will be recruited across 15 countries. Eligibility will no longer be based on lung function and smoking history. **Results:** Primary objective is to evaluate efficacy of dupilumab vs. omalizumab in reducing NP size and improving sense of smell (change from baseline to week 24 in NP score and University of Pennsylvania Smell Identification Test). Secondary objectives include assessment of lung function (pre-bronchodilator forced expiratory volume in 1 second [BD FEV1]), nasal peak inspiratory flow, nasal congestion, quality-of-life (Sino-nasal outcome test [SNOT-22]), asthma control (visual analogue and ACQ-7), and safety. **Conclusions:** EVEREST, the first head-to-head trial comparing efficacy and safety of dupilumab vs. omalizumab will provide evidence to optimize treatment for patients with severe CRSwNP and comorbid asthma.



1285

Establishment of olfactory training within the framework of rehabilitation

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Best Poster Session | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Background: Upper respiratory tract infections, sinonasal disease, trauma, inhalation of drug, and degenerative diseases are among the frequent causes of olfactory dysfunction. Recently, there are cases of olfactory dysfunction caused by COVID-19 infections. **Objectives:** Patients with olfactory dysfunction often receives checkups with T&T olfactometer and alinamin test. As a new treatment method for olfactory dysfunction, they have olfactory training, in which the patients actively sniff the odors. In our hospital, speech therapists perform olfactory training under a rehabilitation doctor. Patients diagnosed with olfactory dysfunction in our hospital had olfactory training for more than 3 months. Olfactory training included exposure to odorants (rose, lemon, eucalyptus, and cinnamon) for 10 seconds each, twice per day (morning and evening). After 3 months, the 4 odorants were changed to lavender, orange, cypress, and vanilla. The results in olfactometry before and after olfactory training were retrospectively compared. **Results:** Before and after olfactory training, no significant improvement was seen in T&T olfactometry, but a significant improvement was seen in Self-administered odor questionnaire, Olfactory QOL questionnaire and visual analogue scale. **Conclusions:** We would like to introduce our efforts for cases of olfactory dysfunction. It is desirable to establish a more effective and uniform protocol for Japanese.



1315

Effect of gut microbial composition and diversity on major inhaled allergen sensitization and onset of allergic rhinitis

Taimu Yamaguchi, Atsushi Matsubara

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Background: Decreased gut microbiota diversity is associated with gut dysbiosis and causes various diseases, including allergic diseases. We investigated the effect of gut microbial composition and diversity on major inhaled allergen sensitization and onset of allergic rhinitis. **Methods:** This study included 1092 local residents who had participated in the Iwaki Health Promotion Project in 2016. Blood samples were analyzed to ascertain specific IgE levels against major inhaled allergens (JCP, HD1, Grass-mix, Weed-mix). Fecal samples were analyzed for bacterial 16S rRNA using next generation sequencing. The diversity index (α -diversity, β -diversity) and the composition of gut microbes in phylum/order levels were compared between patients sensitized or unsensitized to allergen, and symptomatic and asymptomatic groups. **Results:** Some α -diversity metrics were significantly decreased in patients who were sensitized to allergens. β -diversity differed significantly between those unsensitized and sensitized to allergens. The relative abundance of Bacteroidales was significantly lower in the unsensitized group. The composition and diversity of gut microbiota were similar between the symptomatic and asymptomatic groups. **Conclusions:** Our results suggest that lack of diversity in gut microbiota has an effect on sensitization to allergens. However, the onset of allergy symptoms was not significantly associated with bacterial composition and diversity.



1316

Amyloid beta and phosphorylated tau were detected in olfactory mucosa and in nasal swab samples from patients with Alzheimer's disease

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Best Poster Session | Room 11 Hall 3.3 - Level 7 | Monday 19/06/2023

Alzheimer's disease (AD) is pathologically characterized by senile plaques consisting of amyloid beta (Ab) and neurofibrillary tangles formed by phosphorylated tau (p-tau) in the cytoplasm of neurons. These changes begin 10 to 20 years before the clinical onset of AD, and it is important to find the AD patients before having neurodegenerative symptoms. Olfactory epithelium is a unique area where the cranial nerve is exposed to the external environment, and olfactory dysfunction is an early sign of AD. We examined the histochemical changes of nasal mucosa in the autopsy case of juvenile AD and found the neurodegenerative changes in olfactory epithelium. P-tau was detected in neurofibrillary tangles, degenerated olfactory cells and their axons. Ab42 was detected in the cytoplasm of supporting cells. We then developed new methods to detect AD-related biomarkers, Ab42 and tau, in nasal swab samples. We found that p-tau/total-tau ratio in swab samples from the middle meatus and from the olfactory cleft were significantly high in AD patients. These results suggest that nasal mucosa has the potential to provide AD-related biomarkers useful for the early diagnosis of AD.



1366

Analysis of olfactory dysfunction in IgG4-related disease model mouse

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Introduction: Our previous study suggested that olfactory dysfunction is prevalent in IgG4-RD patients (Yagi-Nakanishi et al. Chem Senses. pii: bjw076, 2016). In this study, we examined the olfactory function in IgG4-RD model mice (LAT*Y136F mice) to reveal the mechanism of olfactory dysfunction. Method: Behavioral tests were undergone for LAT*Y136F mice and the histology of olfactory epithelium was analyzed. Results: The olfactory epithelium in LAT*Y136F mice was thinner than age-matched wild type mice. The expressions of Olfactory Marker Protein (OMP) and Growth Associated Protein (GAP-43) in olfactory epithelium of the LAT*Y136F mice were markedly less than wild type mice. Conclusion: The olfactory epithelium impairment caused hyposmia in LAT*Y136F mice. We propose that olfactory dysfunction is a manifestation in IgG4-RD patients.



1370

Optimal primer selection for sinus microbiome profiling - A comparative analysis of V1-V3 and V3-4 16S target regions

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Background: Next generation sequencing (NGS) using 16S rRNA has rapidly accelerated our understanding of the sinus microbiome. Accurate taxonomic representation of the sampled ecosystem is heavily dependent on primer selection. The V1-V3 and V3-V4 hypervariable regions have become the predominant primer targets in sinus microbiome studies. **Methods:** We undertook a cross-sectional paired comparative analysis of 20 middle meatus swabs from patients undergoing endoscopic sinonasal surgery to determine whether primer selection would significantly impact taxonomy and diversity outcomes. DNA extracted from swabs underwent paired sequencing targeting both the V1-V3 and V3-V4 hypervariable regions. **Results:** *Corynebacterium*, *Staphylococcus*, *Cutibacterium*, *Streptococcus*, *Haemophilus*, *Moraxella* and *Stenotrophomonas* were the most abundant genus in both the V1-V3 and V3-V4 primer sets. There was no statistically significant difference in relative abundance between V1-V3 and V3-V4 for the core sinus genera. There was a trend towards greater richness and diversity (Shannon Index) in V3-V4. Beta Diversity metrics using Weighted Unifrac showed no significant difference in community composition between primer sets. **Conclusions:** V1-V3 and V3-V4 target regions both offer reliable and comparable biological conclusions in the sinonasal ecosystem. Variability in diversity metrics may be influenced by the less abundant taxa in a low biomass environment.

1371

Assessment of the expression levels of the MMP-12 in chronic rhinosinusitis with nasal polyps

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Background: Chronic rhinosinusitis with nasal polyps (CRSwNP) is a chronic inflammatory condition of the nasal mucosa and paranasal sinuses associated with frustrating symptoms and low quality of life. The aim of this study was to assess the expression of matrix metalloproteinase-12 (MMP-12), a pivotal regulator of the pathophysiology of several inflammatory diseases, in patients with CRSwNP. Methods: Tissue samples from 37 patients with CRSwNP treated with functional endoscopic sinus surgery and 12 healthy mucosa specimens (control group) were excised intraoperatively. Real-time polymerase chain reaction and Western blotting were used to measure the mRNA and protein expression levels of MMP-12, respectively. Results: mRNA levels of MMP-12 were found considerably increased in the CRSwNP tissue samples compared to those determined in the control group. As far as the protein levels, a non-statistical significant elevation trend was noticed. The "discrepancy" in the expression profile among mRNA and protein levels could be attributed to post-translational gene expression regulation. Conclusion: The raise of MMP-12 in patients with CRSwNP could straighten its potential implication in the pathogenesis of the disease. Our results indicate that MMP-12, in combination with other matrix metalloproteinases, may serve as a biomarker and therapeutic target for nasal polyposis.

1398

Dupilumab Improves Outcomes in Chronic Rhinosinusitis with Nasal Polyps (CRSwNP) Patients with a Type 2 Inflammatory Signature Across Definitions

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Introduction CRSwNP is a predominantly type 2 (T2) inflammatory disease. This post hoc analysis assessed dupilumab efficacy in patients with CRSwNP from the SINUS-24/-52 trials (NCT02912468/NCT02898454) according to different T2 definitions. Methods T2 definitions were: ≥ 150 eosinophils/ μL or total IgE ≥ 100 IU/mL or any coexisting T2 condition; ≥ 150 eosinophils/ μL or total IgE ≥ 100 IU/mL; ≥ 150 eosinophils/ μL (GINA); ≥ 250 eosinophils/ μL or total IgE ≥ 100 IU/mL (EPOS); asthma or ≥ 300 eosinophils/ μL (EUFOREA); any coexisting T2 condition. Odds ratios (ORs; dupilumab vs placebo) of achieving clinically meaningful improvements from baseline to Week (W)24 (pooled SINUS-24/-52) and W52 (SINUS-52) were calculated for nasal polyp score (NPS), nasal congestion/obstruction score (NC), loss of smell score (LoS; all range 0–3; ≥ 1 point improvement), 110-item sinonasal outcomes test (SNOT-22; 0–110; ≥ 8.9), and University of Pennsylvania smell identification test (UPSIT; 0–40; ≥ 8). Results OR ranges (95% confidence intervals) at W24 across the six T2 definitions were: NPS 11.4 (7.4–17.5) to 14.9 (9.4–23.7); NC 6.5 (4.5–9.3) to 9.6 (6.0–15.3); LoS 12.2 (8.0–18.8) to 17.8 (10.6–30.0); SNOT-22 4.3 (3.0–6.0) to 5.3 (3.6–7.9); and UPSIT 21.1 (12.0–37.3) to 34.7 (16.4–73.2) (all $P < 0.0001$). ORs were similar or greater at W52. Conclusion Dupilumab showed robust efficacy across T2 inflammation definitions in patients with CRSwNP.



1421

Endoscopic and open surgical excision of a complicated inverted nasal papilloma of frontal sinus

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Background: Inverted papilloma is a benign sinonasal tumor that can invade surrounding cranial structures. Early detection and prompt surgical treatment are key to ensuring successful patient outcomes. **Case Presentation:** A 66-year-old male patient presented at our ENT clinic due to a mass in his frontal sinus that was discovered incidentally on a CT scan. He reported no symptoms other than exophthalmos of the left eye, while the laboratory results were normal. The CT scan showed a hyperdense mass in the left frontal sinus and the ipsilateral ethmoid air cells, and revealed lytic/sclerotic bone lesions of the posterior wall of the left frontal sinus as well as in the inner and upper corresponding orbital wall. The patient underwent a diagnostic biopsy through paranasal sinus endoscopy, which established the diagnosis of an inverted papilloma of the frontal sinus. The following surgical excision of the mass included both intranasal (Draf IIb procedure) and external approach with an osteoplastic flap of the frontal sinus in order to manage the intraorbital and intracranial extension of the papilloma. **Conclusion:** The patient had a successful postoperative recovery without complications. This case highlights the significance of early detection and the use of a combined surgical approach in the management of inverted papilloma.

1497

Clinical Presentation, Diagnosis, Staging, Treatment, Complications, and Incidence of Juvenile Nasopharyngeal Angiofibromas (JNA) in Denmark

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Objective: To study the incidence rate of JNA in Denmark in the period 2003 to 2022, focusing on clinical presentation, diagnosis, staging, treatment, complications, and prognosis. **Background:** JNA is a rare benign mesenchymal tumor of vascular origin. It usually emerges in the sphenopalatine foramen and exclusively affects adolescent males. Although benign, the tumor shows aggressive growth potential and is fatal if left untreated. The tumor has erosive and bone-remodeling features, which can result in extension into the orbital cavity, the nasal cavity, the paranasal sinuses, and the intracranial cavity. **Methods:** The study is a national retrospective cohort study. All cases of JNA diagnosed in Denmark from 2003 to 2022 were identified through the Danish Pathology Data Bank. Data were extracted from medical records. **Results:** 66 cases were identified. All patients were male. The median age at diagnosis was 16.5 years. The most common symptom was nasal stenosis (100%), followed by epistaxis (68,2%) and nasal secretion (22,7%). The average duration of the symptoms until diagnosis was 9 months. 91% of the patients presented with an enlarged Sphenopalatine Foramen. 8% of the patients had intracranial involvement upon diagnosis. 95% of the patients underwent preoperative embolization. 88% were treated with CAS-FESS, 6% with midfacial gloving, 1,5% with frontal craniotomy, and 4,5% with transpalatal approach in addition to CAS-FESS. 12% had recurrences. Final data analysis and conclusions of this relative large cohort study of JNA will be presented at the conference.

1559

Clinical Presentation, diagnosis, staging, treatment, complications, and incidence of Juvenile nasopharyngeal angiofibromas (JNA) in Denmark

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1619

INTRAOSSSEOUS HEMANGIOMAS OF NASAL CAVITY: TWO CASES REPORTS

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Introduction: Intraosseous hemangiomas of the nasal cavity are rare. This entity can be present in the inferior and middle turbinate, ethmoid sinus or nasal septum. The diagnosis can be difficult, since they can remaining asymptomatic until the tumor becomes large enough. **Methods:** Case reports and literature review. Pre and post-operative image documentation. **Results:** We describe two cases of intraosseous hemangioma of nasal cavity. Both with no history of epistaxis, facial trauma or nasal surgery. Case 1: 57-year-old woman presented with complaints of left nasal obstruction. Sinonasal endoscopy revealed a firm, smooth erythematous mass with an intact surface on the left nasal cavity, at middle turbinate level. Sinus CT demonstrated a expansive lesion centered on left ethmoid cells. Endoscopic sinus surgery was performed with complete resection of Intraosseous cavernous hemangioma. Case 2. 65-year-old man presented with complaints of bilateral nasal obstruction and pain on nasal dorsum. Sinonasal endoscopy revealed bulging in the roof of the left nasal fossa and in the superior septal portion. Sinus CT had demonstrated a 2cm diameter expansive lesion in the transition between the cartilaginous and osseous portion and involving nasal bones. Lateral rhinotomy was performed with complete removal of lesion. Both patients did well postoperatively and was free of symptoms at follow-up. **Conclusions:** Intraosseous hemangioma should be considered in the differential diagnosis of a nasal cavity mass with internal calcifications. Complete surgical excision is recommended.

1669

Invasive Aspergillus flavus Rhino-sinusitis with Intranasal Heroin Use.

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Introduction: Although orofacial complications resulting from cocaine insufflation have been well documented, reports of intranasal opioid abuse are rare. The aim of this study is to present the case of a user of inhaled heroin who developed a necrotizing fungal infection of the nasal cavity, presenting with soft tissue and bone distruction.Case Presentation: An otherwise immunocompetent 37-year-old woman with reported 2-year history of intranasal heroin use was referred to our clinic with a three-month history of progressive nasal pain, epistaxis and purulent discharge with accompanying erosions of the right nasal vestibule. Endoscopically a large septal perforation, purulent exudate and necrotic lesions of right nasal cavity exceeding to the perinasal skin were noted. MRI and CT scans also showed necrosis of palatine process of right maxilla and inferior turbinate. Histopathogy and cultures from the intraoperative debridement revealed an Aspergillus flavus rhino-sinusitis. The patient remained in hospital for treatment with intravenous isavuconazole and amphotericin B with a satisfactory clinical response.Conclusions: Patients with a history of intranasal drug abuse, including heroin, may be at risk of mucosal or bone necrosis leading to invasive fungal infections. Early diagnosis and treatment, even in otherwise immunocompetent individuals, is critical to prevent disease progression.



Best Oral for Junior Grant 2

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Preoperative prediction of sinonasal papilloma by artificial intelligence using nasal video endoscopy: A retrospective study

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Best Oral for Junior Grant 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

Background: Inverted papilloma (IP) is at risk of recurrence and malignancy, and early diagnosis using nasal endoscopy is essential. Herein, we developed a diagnostic system using artificial intelligence (AI) to identify nasal sinus papilloma. **Methods:** Fifty-three patients (21 with IP and 32 with chronic rhinosinusitis with nasal polyp) who underwent endoscopic sinus surgery were included. The endoscopic surgery videos of the patients were edited to train and evaluate deep neural network models, then a diagnostic system was developed. The correct diagnosis rate by visual examination by otolaryngologists was also evaluated using the same videos and compared with that of the AI diagnostic system. **Results:** The diagnostic system had an area under the curve of 0.874, accuracy of 0.843, false positive rate of 0.124, and false negative rate of 0.191. The average correct diagnosis rate among otolaryngologists was 69.4%, indicating that the AI was highly accurate. **Conclusions:** In this study, we created an adjunctive diagnostic system for IP among patients who underwent nasal endoscopy. Although the number of cases was small, we were able to create a highly accurate diagnostic system. Future studies with a larger sample size are warranted to improve the accuracy of the system.

1652

Use of Platelet-rich Plasma in patients with COVID-19 related olfactory dysfunction.

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Background: Olfactory dysfunction associates with viruses such as COVID-19. The aim of our study was to investigate the use of Platelet-rich Plasma (PRP) injections, an autologous blood product with supraphysiologic concentrations of growth factors, in patients with persistent olfactory loss as a result of COVID-19 disease. Methodology/principal: 1 mL of PRP was injected in each olfactory cleft (0.5ml at the septum, 0,5ml at the middle turbinate) in 14 patients. Duration of olfactory dysfunction was between 6 to 24 months (mean \pm SD: 13.8 \pm 5.8). Patients examined with Sniffin' sticks battery test (TDI score) and reported their subjective ratings with a visual analogue scale (VAS) at baseline and one month after PRP injection. Results: No significant differences were found in TDI and VAS score (mean \pm SD, TDI: 21 \pm 3.16, VAS: 3.09 \pm 1.81) before and after PRP injection (mean \pm SD, TDI: 21.9 \pm 4.57, VAS: 3.81 \pm 2.63). Only 2 out of 14 patients (14.3%) showed an improvement of 5.5 points in TDI score. Both of them were hyposmic with a history of the disease 6 and 10 months respectively. None of the anosmic patients showed an improvement in olfactory function Conclusion: Although PRP is a safe treatment it seems that has limited value in the management of olfactory dysfunction caused by COVID-19.



1689

The impact of the COVID-19 pandemic on FESS: A retrospective study.

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AbstractObjectives: Coronavirus disease 2019 (COVID-19) has had a significant impact on healthcare systems around the world. The rapid spread of the virus caused several restrictions, including a limited number of surgeries. The purpose of the study was to compare the number of functional endoscopic sinus surgeries (FESS) and the severity of paranasal sinus diseases performed before the pandemic, during the first wave, after 1 year and 2 years after the COVID-19 pandemic. **Methods:** Volume, demographic data, and additional procedures were analyzed. The severity of paranasal disease was assessed using the Lund-Mackey scoring system. **Results:** There were 105 surgeries performed before the pandemic and, respectively, 35, 141 and 166 during the first wave, after one year and after two years of the COVID-19 pandemic. Regarding age, no significant differences were found between the groups. The most patients were men in all time periods analyzed. The analysis did not show any significant differences between the additional septoplasties performed and/or the turbinoplasties. **Conclusions:** The COVID-19 pandemic caused a very limited number of FESS due to fear of SARS-CoV-2 contamination. Large-scale research is needed to assess the consequences of delayed diagnosis and treatment of chronic rhinosinusitis after the COVID-19 pandemic.



1317

Gustatory function in patients with cerebellopontine angle masses

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Background: The aim of this study is to investigate the impact of cerebellopontine angle masses (CPAM) on gustatory function. **Methodology:** Gustatory function was assessed (Taste Strips) retrospectively in 106 patients (55 females; mean age 55.3 ± 13.5 years). **Results:** The most common CPAM was vestibular schwannoma (VS)(n=89). Overall, the taste strips score obtained from the affected side was lower than the unaffected (p-value=0.019; 95% CI -1.77 to -0.15). When analyzed separately, only VS patients had significantly lower taste strips score on the affected side (p-value=0.044; 95% CI -1.86 to -0.03) without any correlation between taste and Koos stage [(F(3, 85)=1.69, p-value=0.18]. Gustatory function on the affected side was neither correlated with facial palsy (p-value=0.22; 95% CI -3.81 to 0.89) nor pure tone average (p-value=0.36; 95% CI -0.3 to 0.11). **Conclusions:** The CPAM cause a slight but significant decrease in gustatory function on the affected side compared to the healthy side. This is most pronounced in VS and unrelated to the Koos stage.

1332

Systematic MRI in persistent post COVID-19 olfactory dysfunction should be reassessed

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Magnetic resonance imaging (MRI) is the gold standard in the etiological assessment of a persistent smell dysfunction. MRI is recommended in all patients with persistent olfactory disorders (OD > months). The high prevalence of persistent OD after SARS-CoV-2 infection means evaluating this strategy is an important public health matter. The main objective of this study was therefore to examine the impact of systematic MRI on the management of patients with OD and to evaluate the relationship between the severity of the OD as measured by psychophysical testing and the volume of the OB measured by MRI. This was an observational study including all adult patients with persistent OD confirmed by an abnormal European Test of Olfactory Capabilities (ETOC) score, after confirmed SARS-CoV-2 infection (by PCR). Among the 67 patients with confirmed SARS-CoV-2 infection, none of the MRI exams altered the initial diagnosis of persistent post-viral smell dysfunction. This suggests that systematic MRI may be unnecessary in patients whose persistent olfactory impairment began soon (a few days) after confirmed SARS-CoV-2 infection. Guidelines for the use of MRI should be based on clinical abnormalities and the likelihood of results leading to changes in treatment.



1342

Prognosis value of olfactory dysfunction in patients with COVID-19: the COVIDORA study

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Among all studies describing COVID-19 clinical features, only a few retrospective studies have assessed the correlation between olfactory dysfunction (OD) and the evolution of the disease severity. The main aim was to assess whether OD is a predictive factor of COVID-19 severity based on the patient's medical management. A national, prospective, multicentre, cohort study was conducted in twenty public hospitals and a public centre for COVID-19 screening. During the first wave of the pandemic, all patients tested positive for COVID-19 underwent two follow-up ENT consultations within 10 days of symptom onset. The main outcome measures were the evolution of medical management (ambulatory care, standard hospital admission, ICU admission) at diagnosis and along the clinical course of COVID-19 disease. Among 481 patients included, the prevalence of OD was 60.7%. Among patients reporting OD, 12.3% required an hospitalization, all kind of units combined (standard medical unit or ICU). Patients reporting OD were significantly less hospitalized than the ones managed as outpatients, in either a standard medical unit (adjusted OR 0.32 [0.20-0.52] $p < 0.001$) or an ICU (adjusted OR 0.05 [0.01-0.23] $p < 0.001$). As regards the clinical course of COVID-19 disease, OD could predict a decreased risk of hospitalization.



1479

Olfactory dysfunction and diabetic complications in type 2 diabetes mellitus

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Background: Available literature suggests a link between type 2 diabetes mellitus (T2DM) and olfactory dysfunction (OD). It is possible that the pathophysiological mechanisms driving diabetic complications may also determine the onset of OD. The aims of this study are to evaluate the prevalence of OD in a group of T2DM patients and in a comparable control group and to analyze the relationship between OD and diabetic complications. Materials and methods: 120 T2DM patients and 90 controls with comparable clinical and demographic characteristics and age between 30 and 65 years were enrolled in the study. Each individual underwent nasal endoscopy, olfactory testing with Extended Smell Test by "Sniffin' sticks" and subjective evaluation with the Italian version of the brief Questionnaire of Olfactory Disorders (brief-IT-QOD). Data regarding disease condition, complications and laboratory tests were also collected for T2DM patients. Statistical analysis was based on non-parametric tests and regression analysis. Results: The prevalence of OD was significantly higher in T2DM patients than in controls, specifically in T2DM patients suffering from complications. The same group also reported significantly higher scores at Brief-IT-QOD. Regression analysis highlighted a significant correlation between OD and age, glycaeted hemoglobin values and diabetic complications. Conclusions: OD affects more frequently T2DM patients suffering from complications and may be considered one of them.

1503

Approach and Avoidant Coping is Associated with Olfactory-Specific Quality of Life Outcomes in Individuals with Olfactory Dysfunction

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Introduction: Olfactory dysfunction (OD) is a highly prevalent and persistent symptom of COVID-19 infection. Smell loss has been shown to impair appetite, social relationships, and ability to sense danger, which can greatly impact quality of life (QoL). Because coping strategies have been shown to moderate the effect of disease symptoms on functional and affective outcomes, the aim of this study was to determine whether certain coping strategies moderate quality of life outcomes. **Methods:** Participants with subjective OD after COVID-19 infection underwent Sniffin' Sticks olfaction testing and completed the Brief-COPE and Questionnaire of Olfactory Disorders-Negative Statements (QOD-NS) to elicit coping strategies and olfactory-specific QoL, respectively. ANOVA and spearman correlations were used for statistical analysis. **Results:** Participants with both subjective and objective OD (n=52) had a significantly higher mean QOD-NS score compared to the normosmic cohort (n=8) (p<0.0001). Higher approach coping was significantly correlated with lower QOD-NS scores (p = 0.0242), whereas avoidant coping mechanisms correlated with higher QOD-NS scores (p=0.0444). **Conclusion:** Individuals with OD have notably poor olfactory-specific quality of life. Among those with OD, approach coping mechanisms are associated with better QoL, whereas avoidant coping tracks with worse QoL, offering opportunity to counsel patients accordingly.



1686

Postmortem bedside endoscopic endonasal surgical procedure as a new sampling method for investigating the olfactory mucosa and bulb and adjacent tissues

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Harvesting high-quality tissue from the human olfactory mucosa and olfactory bulb has proven challenging using existing methods such as biopsy or during autopsy. We therefore developed a protocol for rapid postmortem bedside sampling of these tissues, using an endoscopic endonasal surgical technique adapted from skull base surgery. It involves complete resection of the inferior, middle, and superior turbinates to harvest respiratory mucosa, followed by a sharp subperiosteal dissection of the entire mucosa lining the olfactory cleft to procure olfactory cleft mucosa. The skeletonized anterior skull base is then removed, followed by incision of the dura mater, to expose the olfactory bulb and adjacent brain regions for sampling. With some experience in endoscopic sinus surgery, the sampling protocol can be performed within 1 hour. In contrast to conventional autopsies, this endoscopic method leaves no visible scars and facilitates a rapid response and logistic flexibility in various settings, thereby drastically reducing postmortem intervals (median: 89 minutes, n=138). The large tissue specimens of pristine quality benefit the representativity and spatial data, while preserving the biomolecular integrity. This protocol provides an efficient and comprehensive sampling method for histomolecular investigations of human olfactory tissues.

1760

Smell, taste, and chemesthesis dysfunction 6-months after COVID-19 and factors associated with complete recovery

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Background: Smell disorders persist in about half of the patients with other symptoms of COVID-19 disease, the exact duration of the symptoms is yet unknown. Objectives: To examine the recovery of olfactory, gustatory, oral chemesthetic deficits in a cohort of individuals infected with SARS-CoV-2. Methods: Patients with confirmed COVID-19 were tested at baseline (n=87) and six months later (n=76). The UPSIT, the Global Gustatory Test, a test for chemesthesis were administered at all visits. Results: Olfactory function recovery was unrelated to the hypertension OR 0,26 (0.03-2.49), p = 0,24, DM OR 0,71 (0.08-6.76), p = 0,77, nasal diseases OR 0,74 (0.48-1.15), p = 0,18. Smoking was associated with poor recovery OR 2,08 (0.54-7.91), p = 0,28. There is no significant difference between parosmia (13%, p = 0,14) and fantosmia at the onset of the disease (10%, p = 0,42) and 6 months later (12%, p = 0,19 and 13%, p = 0,13, respectively); parallel pattern was observed between sense of taste at baseline OR 14,00 (12,00–15,00, p = 0,73), and at 6-month follow up OR 15,00 (13,00–16,00, p = 0,19). After 6 months all patients reported normal chemesthesis and chemical sensation. Future studies with larger cohorts are recommended.

1680

Tubal auto-insufflator device is a predictor of successful eustachian tube balloon tuboplasty

José Carneiro, Alice Vicente, Isa Eloj, Miguel Furtado, Franklin Marino-Sanchez, João Carlos Ribeiro

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Objective: Eustachian tube balloon tuboplasty (ETBT) emerged as an alternative treatment with promising outcomes in bothersome symptomatic patients with Eustachian tube dysfunction (ETD). No objective predictor of success is known. This study aims to evaluate the role of a tubal auto-insufflator (TAI) device as a success predictor of a ETBT. **Methods:** prospective cohort study with 236 ears diagnosed with ETD underwent treatment with a TAI device, followed by ETBT. ETD treatment response to the TAI and ETBT were assessed through measurement of middle ear's pressure (MEP) tympanometry, ETD symptoms (ETDQ-7) and quality of life (SNOT-22). **Results:** There was a 20.4 ± 5.6 decrease in the ETDQ-7 mean score after TAI device and a 21.4 ± 5.1 decrease after ETBT, comparing to baseline values ($p < 0.05$). Mean negative MEP increased by 41 ± 33 daPa after TAI device and 90 ± 42 daPa after ETBT ($p < 0.05$). Negative MEP, ETDQ-7 and SNOT-22 post-TAI device and ETBT were positively correlated, as patients with greater benefits following medical treatment achieved better surgical results, regarding symptom severity of ETD ($p = 0.798$), MEP ($p = 0.320$) and quality of life ($p = 0.261$), $p < 0.001$. ETDQ-7 post-TAI device ≤ 14 predicts a normal ETDQ-7 after ETBT with 77,8% sensitivity and 76,7% specificity. **Conclusion:** Our study proves that a safe, simple, non-invasive and non-drug related therapeutic device predicts successful surgery outcomes, which may become extremely valuable to define patient groups who will benefit the most from valuable to define patient groups who will benefit the most from ETBT.



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Associations Between Olfactory Dysfunction and Cognition in Young and Middle-Aged Adults: A Scoping Review

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Best Oral for Junior Grant 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

Introduction: Olfactory dysfunction (OD) is a precursor in neurodegenerative disease progression and may serve as a predictor of neurocognitive decline in Alzheimer's disease. Research on olfaction and cognition has predominantly involved older populations who are at highest risk for neurodegenerative disease. The aim of this scoping review was to conduct a literature search to understand the association between cognitive outcomes and OD among young and middle-aged adults. **Methods:** Comprehensive literature search of PubMed, Ovid Embase, Web of Science and Cochrane Library identified eligible studies. The outcome of interest was the association between OD and neurocognitive functioning in adults less than 60. **Results:** Of 2879 abstracts screened, 171 underwent full text review, with 73 studies selected for data extraction. Olfactory function was measured with Sniffin' Sticks, smell identification tests, and smell threshold tests. Various tests of cognition measured memory, executive function, verbal fluency, and others. A significant association between olfactory impairment and worse cognition was found in 57 studies, while 16 studies did not find any significant associations. **Conclusion:** OD may be closely associated with impaired cognition, however, further investigation is needed to assess if these changes are age-associated with specific neurocognitive domains and if OD etiology impacts these alterations.



Smell and Taste 1

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Individualized Treatment Protocol for Long-Lasting Olfactory Dysfunction Following COVID-19 Infection: A Prospective Study

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Smell and Taste 1 | Room 9 Olympic Hall - Level 0 | Tuesday 20/06/2023

Objective: The main objective of this prospective study was to evaluate the effectiveness of non-randomized, standardized protocols for treating COVID-19 related olfactory dysfunction. The study aimed to determine the benefit of adding adjuvant therapies to olfactory training to treat post-COVID olfactory pathology. **Methods:** Patients with long-lasting post-COVID-19 olfactory dysfunction were evaluated using a non-randomized protocol based on individual nasal endoscopy findings and patient preferences. Patients were assigned either to olfactory training alone or olfactory training with adjuvant therapy. **Results:** The study enrolled 47 patients and all groups showed significant improvement in olfactory thresholds at a 3-month follow-up, suggesting the protocol's effectiveness. Patients undergoing olfactory training with adjuvant therapy showed better improvement in mean olfactory thresholds than those undergoing olfactory training alone. **Conclusions:** This is one of the first studies to demonstrate results in the treatment of post-COVID-19 persistent olfactory impairment. A customized approach may be a valid option for the management of persistent post-COVID-19 olfactory disorder. Adjuvant therapy could be considered in addition to olfactory training, but further studies are needed in order to confirm its effectiveness.

1162

Prednisolone does not improve olfactory function after COVID-19; a randomized, double-blind, placebo-controlled trial.

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Background Prednisolone has been suggested as a treatment for olfactory disorders after COVID-19, but evidence is scarce. Hence, we aimed to determine the efficacy of a short high-dose oral prednisolone treatment on patients with persistent olfactory disorders after COVID-19. **Methods** We performed a randomised, double-blind, placebo-controlled, single-centered trial. Patients were included if they were > years old and if they had persistent (>4 weeks) olfactory disorders within 12 weeks after a confirmed COVID-19 test. The treatment group received oral prednisolone 40mg once daily for ten days and the placebo group received matching placebo. In addition, all patients performed olfactory training. The primary outcome was the objective olfactory function on Sniffin' Sticks Test (SST) 12 weeks after the start of treatment, measured in Threshold-Discrimination-Identification (TDI) score. **Results** We randomly assigned 115 patients to the treatment (n=58) or placebo group (n=57). There was similar improvement on olfactory function in both groups after 12 weeks. Median TDI score on SST was 26.8 (IQR 23.6-29.3) in the placebo group and 28.8 (IQR 2.0-30.9) in the prednisolone group, with a median difference of 2.0 (95% CI 0.75 to 1.5). **Conclusion** This trial shows that prednisolone does not improve olfactory function after COVID-19. Therefore, we recommend not prescribing prednisolone for patients with persistent olfactory disorders after COVID-19. This trial is registered on the ISRCTN registry with trial ID ISRCTN70794078.



1163

How well do you smell?

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We often think that our smell is inferior to our other senses; as vision and hearing. But is that really true? How do the senses compare? In this presentation you can test your own senses. Also, you will receive background on the different working mechanisms behind them,



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Evaluating Surgical Treatment for Cleft Lip Nasal Deformity on Patients' Olfactory Function

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Smell and Taste 1 | Room 9 Olympic Hall - Level 0 | Tuesday 20/06/2023

Background: Although patients with unilateral cleft lip nasal deformity (uCLND) experience significant nasal obstruction that impact their breathing, little attention has been given to their concomitant uCLND induced olfactory dysfunction and whether or not the standard rhinoplasty for definitive cleft repairs is sufficient to correct patients' airway obstruction and restore their olfactory impairment. **Methodology/Principal:** This is an ongoing prospective study. Three patients (P1, P2, P3) with uCLND who underwent rhinoplasty for definitive cleft repairs of nasal obstruction were selected for this report. Patients' nasal resistance (NR) was measured before and after surgery using the NR6 Clinical/Research Rhinomanometer. Two psychophysical olfactory tests were administered to each patient before and after surgery. The University of Pennsylvania Smell Identification Test (SIT), and the Snap & Sniff Threshold Test (SSTT). **Results:** Bilateral NR improved in all patients after surgery, but NR worsened on the cleft-side in two patients (P1: 21.4Pa.s/ml vs 25.5Pa.s/ml; P2: 37.5Pa.s/ml vs 51.1Pa.s/ml). Bilateral SIT improved after surgery in two patients (P2: 35 vs 36; P3: 29 vs 32) but declined in P1 (29 vs 23). Cleft-side SSTT declined in all three patients (P1: -4.9log vol/vol vs -2.0log vol/vol; P2: -5.9log vol/vol vs -5.8log vol/vol; P3: -5.9log vol/vol vs -5.0log vol/vol), but noncleft-side SSTT improved in P1 and P3. **Conclusion:** Preliminary results suggest that current surgical treatment may not adequately address patients' olfactory impairment.



1291

Anosmia in Patients with Moderate to Severe SARS-CoV-2 Infection

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Smell and Taste 1 | Room 9 Olympic Hall - Level 0 | Tuesday 20/06/2023

Background: In a number of studies anosmia is reported as a frequent early symptom of SARS-CoV-2 infection, associated with milder course of the disease and successful recovery. However, there are numerous cases of hospitalized and diseased COVID patients with anosmia. **Methods:** We studied 1127 patients, hospitalized in the HBAAT of MMA, Varna, Bulgaria, in the period August 2020-February 2022. The patients are divided into three groups according to the time of the infection and probable SARS-CoV-2 variant. We compared anosmia to the disease course, laboratory results and outcome. **Results:** We found heterogeneous ratios between anosmia and the outcome of the disease in the different time periods. In the first and second group the percentage of diseased patients with anosmia was very low (2.5% and 4.17% respectively), while in the third group it was significantly higher (30%), as compared to a total of 10.47% mortality rate for the whole period. **Conclusions:** In patients with moderate to severe SARS-CoV-2 infection, anosmia is not a reliable prognostic symptom for the course and outcome of the disease. The strong variability of the virus changes the frequency of anosmia, as well as its correlation to the disease outcome.



1300

Olfactory function in patients with parosmia and phantosmia

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Purpose: Some molecules including furfural mercaptan [FFT] and 2,6-nonadienal [Nonadienal] are suspected to trigger parosmia. We hypothesized that altered sensitivity to these molecules in patients with olfactory dysfunction (OD) may affect parosmia. We focused on FFT and Nonadienal threshold of patients with parosmia (PAR), phantosmia (PHA) and quantitative OD without either parosmia or phantosmia (ParPha-) and compared them with healthy controls. **Methods:** We included 342 participants: 190 PAR, 93 PHA, 28, 31 ParPha- and 28 healthy controls, using structured history and investigated general otorhinolaryngologic examination and the Sniffin' Sticks olfactory test battery. In addition, thresholds of FFT and Nonadienal were measured in a subset of participants. **Results:** Regarding Phenyl Ethyl Alcohol (PEA) thresholds the control group scored highest followed by PAR and PHA/quantitative OD. Interestingly, there were no significant differences in FFT and Nonadienal threshold score between the three groups. **Conclusion:** PAR had better olfactory function than ParPha-. However, sensitivity to FFT or Nonadienal did not change among the groups. As shown for two trigger molecules for parosmia the distorted sensations are not due to an increased sensitivity towards certain odorants, which points towards more complex mechanisms responsible for the generation of parosmic sensations.



1305

Trans-septal suture of the middle turbinate doesn't impair the olfaction after endoscopic sinus surgery in CRSwNP

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Smell and Taste 1 | Room 9 Olympic Hall - Level 0 | Tuesday 20/06/2023

Background: Many medializing techniques of the middle turbinate (MT) have been published to prevent MT lateralization during endoscopic sinus surgery (ESS) for chronic rhinosinusitis with nasal polyps (CRSwNP). This procedure has been questioned that it could theoretically impair olfaction. Our study aims to measure its effect on the sense of smell. **Methodology:** Quasi-experimental study measuring of the olfactory function (Barcelona Smell Test -24 / BAST-24), sinonasal symptoms (visual analog scale / VAS), and quality of life (QoL, SNOT-22 and SF-36) was performed before and 6 months after ESS. **Results:** A total of 69 patients underwent ESS (29 with and 40 without MT suture). The mean age was 49.5±1.7; 37.7% were female. Study and control groups presented significant improvement of smell loss VAS 6 months after surgery (study group: 76.3± 5.8 to 33.4±8.3 and control group 77.7± 4.5 to 40.4±7.0), BAST-24 detection (study group: 49.0%± 8.5 to 78.9%±8.3 and control group 43.2%± 6.4 to 77.7%±7.0) and BAST-24 identification (study group: 24.4%± 5.8 to 41.8%±6.0 and control group 21.3%± 4.1 to 41.8%±4.8), with no differences between groups. Besides, both groups experienced a significant postoperative improvement in sinonasal symptoms and QoL. Our results determined no statistically significant differences among groups in any area. **Conclusions:** Trans-septal suture of the MT does not impair the sense of smell, cause additional sinonasal symptoms, nor affect the QoL postoperatively in patients with CRSwNP who undergo ESS.

1310

Does Olfactory Dysfunction Appear as a Consequence from COVID 19 Disease? Treatment Options.

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Smell and Taste 1 | Room 9 Olympic Hall - Level 0 | Tuesday 20/06/2023

Aim: Hypotheses for the development of olfactory dysfunction include the loss of olfactory sensorial neurons; damage the supporting cells in the olfactory epithelium, the neurotropic potential of coronaviruses, and their affecting the olfactory bulbus and or olfactory – related brain areas. **Introduction:** Covid 19 pandemic caused by corona come along with olfactory loss, unlike its previous outbreaks. Loss of smell is a common complaint in adults; yet, it has been underestimated. Anosmia, parosmia, complete loss of smell, is thought to affect at least 1% of the population, with the overall estimated prevalence of olfactory disorders now thought to be more than 20%. Olfaction plays important roles in daily life, ranging from safety perception, to psychosocial functions (such as recognition of emotions mediated through body odors) and enjoyment of food and drink. Olfactory dysfunction may therefore lead to significant morbidity in the form of nutritional disturbance, social anxiety, or depression. **Material and Methods:** In our study 50 patients with PostCovid 19 olfactory dysfunction (anosmia , parosmia, loss of smell, with and without rhinorrhea) have been observed in the period of 2020 – 2022. The patients were examined on the first examination date (nasal endoscopy was used) The next examination dates were after 1 month, 2 months, 4 months and 6 months after the first check. Nasal and throat smear was taken in all patients, as well as allergy – tests, only in patients with positive anamnesis of allergic rhinitis. All of (100%) patients were prescribed with Vitamin therapy: Omega 3 oil acids, Vit. D supplements, 40% of patients have been treated with nasal topics steroids (Fluticasone proprionat or Budesonide), for other 40% olfactory training was suggested, and in 20% of the patients have been prescribed herbal nasal solutions for mucosis regeneration. **Results:** After 2 to 4 months we reached the first results: the results were positive in those 45% of patients which used the olfactory training, 30% which have been treated with nasal topics steroids, and 15% in those who used herbal nasal solutions in combination with vitamins. In 10% of the patients there was no improvement. **Conclusion:** Studies revealing the pathophysiology are important for understanding the the postviral olfactory loss as well as developing new treatment modalities.

1313

SARS-CoV-2-induced inflammation and intracranial infection through the olfactory epithelium-olfactory bulb pathway in non-human primates

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Background: Olfactory dysfunction is a frequent symptom in patients with COVID-19. However, the pathophysiology of SARS-CoV-2-associated olfactory dysfunction is poorly understood. Olfactory epithelium is a unique area where the cranial nerve is exposed to the external environment. We hypothesized that SARS-Cov-2 infection of olfactory system may lead to intracranial infection and cause neuropsychiatric symptoms. **Methods:** We examined histopathological changes of olfactory mucosa in cynomolgus and rhesus macaque model of SARS-CoV-2 infection at day 7. Localization of N protein of SARS-CoV-2 was examined using immunohistochemical staining and viral RNA was quantitatively measured by RT-PCR to evaluate the intracranial infection through the olfactory epithelium-olfactory bulb pathway. **Results:** SARS-CoV-2 infection induced severe inflammatory changes in olfactory mucosa; inflammatory cell infiltration, mucus hypersecretion, edema, dilated blood vessels, epithelial detachment and formation of nose-associated lymphoid tissues (NALT). Supporting cells and olfactory neurons were infected and N protein of SARS-CoV-2 was detected in axons of olfactory neurons and in olfactory bulbs. Viral RNA was detected in olfactory bulbs and brain at day 3 and day 7. **Conclusions:** SARS-CoV-2 infection induces various inflammatory responses in olfactory mucosa of cynomolgus and rhesus macaques. Olfactory epithelium-olfactory bulb pathway may be important for the intracranial infection with SARS-CoV-2.

1351

Olfactory and gustatory impairment and their nutritional impact in systemic cardiac amyloidosis: a prospective study.

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Introduction: Amyloidosis is a multi-systemic disease with a poor prognosis. Our objective was to assess the prevalence of olfactory and gustatory disorders in a population with cardiac amyloidosis (CA). **Method:** We enrolled prospectively patients with CA performing: nasal endoscopy, olfaction and gustatory questionnaire, "Sniffin' Sticks" test (SST) and Taste Band Strips test, and a nutritional evaluation (physical measurements and MNA questionnaire). Results were compared between subtypes of CA (mutated or wild-type transthyretin and AL (light chain)) and to standards of olfactory function in the general population. **Results:** Twenty-four patients were included (mean age of 78.8 +/- 9.8 years; 58.3% of men). The mean total score (TS) on the SST was 16.8/32 +/- 5.8: 5/24 patients (20.8%) were anosmic, 8/24 (33.3%) hyposmic, while 4/24 (16.7%) were complaining of dysosmia. Prevalence of dysosmia was higher than in general population. The AL group had the lowest mean TS (14.9 +/- 7.7). Taste impairment was noted in 14/24 patients (58.3%). A high prevalence of nutritional depletion was noted: 9/24 (37.5%) and 11/24 (45.8%) had respectively a tricipital fold below the norm and a subnormal brachial circumference. **Conclusion:** This preliminary study showed that more than 50% of CA patients have olfactory and gustatory impairments.



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Efficacy of olfactory training in olfactory dysfunction associated with COVID-19: our experience

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Smell and Taste 1 | Room 9 Olympic Hall - Level 0 | Tuesday 20/06/2023

Introduction: Olfactory dysfunction is a frequent symptom and complication associated with SARS-CoV-2 infection. It is estimated that it occurs in 60% of patients with a complete resolution in most cases. However, given the high global prevalence, even a small proportion represents a high percentage of patients with olfactory sequelae. **Material & Methods:** A prospective study was conducted in patients with olfactory dysfunction secondary to COVID-19. All patients underwent anamnesis, nasal endoscopy, quality of life tests and evaluation of orthonasal smell with "Sniffin' Sticks". All patients with olfactory alterations were prescribed with nasal corticosteroids and olfactory training. Evaluations with olfactometry and quality of life tests were performed until 9 months of follow-up. **Results:** A total of 65 patients were evaluated, 47 women and 18 men. The mean time between the onset of symptoms and the first evaluation was 10 months. The main symptom was parosmia with hyposmia in 33.9% followed by anosmia in 32.3%, hyposmia in 30.8%, and cacosmia 3.1%. After the first phase of treatment, there was an improvement in the TDI of 5.4 points on average and an improvement of 3.4 in the threshold subtest. Likewise, in the group who continued the olfactory training for 6 months presented an extra improvement of 4.4 points more. **Conclusions:** Olfactory training is a beneficial and effective treatment and its initiation should be considered as soon as possible in all patients who do not present spontaneous improvement.



CRS – surgical management 2

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Evaluation of effect of preoperative treatment with topical steroids on bleeding during Endoscopic Sinus Surgery. A randomized controlled pilot study.

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CRS – surgical management 2 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Background: Functional endoscopic sinus surgery (FESS) is frequently indicated in Chronic Rhinosinusitis. Bleeding impairs the surgery field and increases the risk and time during FESS. Evidence suggest that oral steroids can reduce bleeding in FESS. **Objective:** To evaluate the preoperative effect of topical steroids in surgical field quality and bleeding during FESS. **Methods:** We prospectively enrolled 23 patients with FESS indication in a single-blind randomized pilot study. All patients completed the SNOT-22 questionnaire and underwent clinical evaluation and anamnestic data collection. Eosinophils and IgE serum levels and Lund-Mackay score were also collected. The included patients were randomly assigned in two groups. The intervention group(A) received a daily prescription of nasal steroid (fluticasone furoate, 55µg/day) 2 weeks before surgery. The control group(B) was instructed to don't use nasal steroids in the same period. The surgery was performed under total intravenous anesthesia, topical and local anesthesia, through the same protocol. The surgical field quality was assessed every 20 minutes by two surgeons. The operating room occupation and the operating time were collected. **Results:** The two groups were similar in their overall demographic and clinical characteristics. A better surgical field quality was found in group A, although there was no statistically significant. The operating room occupation time was significantly lower in the group A (p=0.022). **Conclusion:** Nasal steroids treatment can improve the surgical field quality during FESS and reduce surgery time.



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Management strategy for Chronic Rhinosinusitis with asthma

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CRS – surgical management 2 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Background: Chronic rhinosinusitis (CRS) with asthma is considered as an unique subgroup of CRS, with specific clinical manifestation, pathophysiologic mechanism and poor treatment outcome. However, the long-term outcome of sinus surgery is unknown. Methodology/Principal: Eighty CRS patients with asthma who underwent endoscopic sinus surgery were recruited. Seventy-three were follow-up for more than 5 years (8.22 ± 2.75 years). Results: VAS scores of general symptoms were significant improved (4.09 ± 3.56 vs preoperative 8.56 ± 9.66 , $p < 0.01$). However, only 23% of patients (17/73) remained controlled. 34% (25/73) of patients had revision surgery. Conclusions: Endoscopic sinus surgery improved the symptoms of CRS in the long-term follow-up. However the long-term outcome of endoscopic sinus surgery is unsatisfying.



1590

Extended frontal sinus surgery: novel modifications for better outcome.

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Objective. Modified Lothrop procedure (MLP) has become a procedure of choice in selected cases of severe forms of frontal sinusitis. Nevertheless, the problem of technical difficulties as well as a high risk of postoperative scarring of frontal sinus neo-ostium represent a significant problem nowadays. We introduced several technical tips for better intraoperative orientation as well as grafting technique for postoperative scarring prophylaxis. Materials and methods. MLP in our modification was performed in 43 patients. The technical innovations included anterior boarder of drilling definition, dominant frontal sinus definition, M-sign and grafting technique to cove a raw bone. Results of perioperative complications rate, pre- and postoperative paranasal CT scan data (Lund-Mackay scale), SNOT 22, postoperative scarring and need for revision procedure rate were analyzed. Average follow-up period was 22,8 (12;72) months. Results. There were no perioperative major complications in any patient. Postoperative scarring rate with need for revision surgery occurred in two patients (4,7%). There was statistically significant decrease in SNOT-22 and L-M-scale rates in long-term postoperatively. Conclusions. The modified Lothrop procedure with tips introduced is highly effective in surgical treatment of severe forms of frontal sinusitis and gives reliable long-term results.



1594

Where are we with total intravenous anesthesia versus inhalational anaesthetic during endoscopic sinus surgery? - A cutting-edge review

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Introduction: Endoscopic sinus surgery (ESS) is a surgical procedure that can be used to treat chronic rhinosinusitis that is refractory to medical management. Intraoperative bleeding during endoscopic sinus surgery can be challenging due to the narrow sinonasal surgical field, single working hand, and the use of endoscopic instruments, which may affect hemostasis. There is a role for the type of used anesthesia for intraoperative bleeding control. Total intravenous anesthesia (TIVA) and inhalational anesthesia (IA) are the two most used anesthetic techniques during ESS. While both techniques have their advantages and disadvantages, there is a need to compare their efficacy and safety to determine which technique is more appropriate for ESS. In this review, our main focus was to summarize the current evidence about the different types of anesthesia used in ESS. Methods: Systematic review of the PubMed/MEDLINE database using specific terms related to TIVA and IA in ESS, in English. Results: A total of 548 publications were considered. Among these, 329 studies did not fulfill the criteria for inclusion in the systematic review, resulting in the inclusion of only 132 publications – 13 systematic reviews, 32 reviews, 92 randomized controlled trials, 13 meta-analysis. Conclusion: The state-of-art favors the use of TIVA in ESS due its significant improvement in the intra-operative surgical field during ESS with less blood loss. Further studies that aim to compare long-term nasal status with objective tools, ideally in similar pathology with the same surgeon

**1596****Diagnosis and treatment of intracanal optic nerve cavernous hemangioma : a case report****Liu Wendong¹**, Chen Fenghong¹, Zhang Minjuan², Zuo Kejun¹, Shi Jianbo¹¹ The First Affiliated Hospital, Sun Yat-sen University,, ²The First Affiliated Hospital, Sun Yat-sen University

CRS – surgical management 2 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Here we report a 42-year-old female complaining of loss of vision and visual field defect in the left eye (BCVA 0.1), who was diagnosed with cavernous hemangioma in the left optic canal. The size of the cavernous hemangioma lesion was 3.5 mm × 6.2 mm. We performed transnasal endoscopic optic canal and orbital decompression and orbital cavernous hemangioma resection without the assistance of a navigation system. After the surgery, her left vision was enhanced to 1.0 with normal visual field, eye position and movement. Orbital cavernous hemangioma is a venous malformation originating in the orbit, which can be located inside the cone, outside the cone, or in the optic canal. Depending on the location of the lesion, different surgical approaches can be selected, such as anterior orbitotomy, lateral orbitotomy, medial orbitotomy, a combination of internal and external approaches, transnasal endoscopy, or endoscopic-assisted orbitotomy. Surgery for cavernous hemangioma in the orbital apex and optic canal is fairly challenging. The principle of surgery is carefully and elaborately separating and resection of the lesion, protection of the optic nerve, and avoiding damage to the ophthalmic artery and extraocular muscles. The operation requires precise positioning, less bleeding, and complete lesion removal.



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TREATMENT OF FRONTOETHMOIDAL OSTEOMAS

Eduardo Figueroa, Carlos Ruggeri

CRS – surgical management 2 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Background: Osteomas are benign, slow-growing tumors that primarily affect the frontal and ethmoid sinus. Most are asymptomatic and are diagnosed as imaging findings. When they produce symptoms, treatment is surgical. The surgical approach can be external, endonasal with endoscopes or combined. Objective: To determine the efficacy of surgery to resect symptomatic frontoethmoidal osteomas, and to establish the factors that could facilitate an endonasal endoscopic approach. Place of application: Otorhinolaryngology Department, Hospital Italiano de Buenos Aires. Design: Descriptive and retrospective study. Population: Patients older than 18 years old operated for frontoethmoidal osteomas. Methods: Patients who were surgically treated for symptomatic frontal and ethmoidal sinus osteomas between August 2007 and June 2022. They were evaluated by nasal endoscopy and non-contrast computed tomography (CT) of the facial mass. In frontal osteomas, an endonasal approach with endoscopes (Draf IIa with prebullar and Lothrop technique) and osteoplastic surgery without obliteration was performed. In the ethmoid ones, anterior ethmoidectomy with resection of the same. Results: Ten patients were treated surgically. Two patients had ethmoid osteomas and one had ethmoid-sphenoid osteomas. A complete resection was performed, and tumor reduction in the one with extension to the sphenoid. Other five patients presented osteomas in the frontal sinus. In all of them a complete resection of the lesion was performed. No recurrences were evidenced at 2 years of follow-up, with resolution of the initial

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Outcome After Nasal Polyposis surgery after a Minimum Observation of 10 Years

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Objective: In this study, we aim to estimate disease recurrence during a long-term follow-up, together with the investigation of possible predicting and/or influencing parameters. **Methods:** Out of 196 patients operated for CRSwNP between 01/2000 and 01/2006, 133 patients had a follow-up of at least 10 years and could be included. The inflammatory profile at surgery was determined on nasal tissue and sinonasal secretions, and included analysis of eosinophils, eosinophilic-rich mucus (ERM) typically containing Charcot-Leyden crystals (CLC), and fungal hyphae (FH). During follow-up, recurrence, received treatments and comorbidities were collected. **Results:** Out of the 133 included patients, local eosinophilia was present in 81% and ERM in 60%. Recurrence during follow-up was observed in 62%, and was associated with local eosinophilia and ERM (both $p < 0.001$). Asthma was present in 28% at inclusion, and 17% developed asthma after surgery during follow-up. The presence of asthma, at inclusion as well as developed during follow-up, was significantly associated with recurrence of CRSwNP ($p < 0.001$ for group comparison). **Conclusion:** Recurrence after CRSwNP surgery is common when a long-term follow-up is taken into account. ERM detected in sinonasal secretions at surgery seems to be a predictive factor for recurrence and need for revision surgery. Asthma is a frequently found comorbid factor in CRSwNP, develops even at higher age despite surgical treatment for CRSwNP, and is also associated with a higher recurrence rate. Sustained medical care after surgery is mandatory.



1656

The use of a 90-degree endoscope for the visualization of the maxillary sinus

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Objectives: Middle antrostomy (MA) is the "gold standard" of surgery management of chronic maxillary sinusitis. However, the lack of visualization of anterior-medial areas of the maxillary sinus (MS) is one of the main factors of completing additional approaches. The use of endoscopes with a wide field of view allows to upsize the visualization and reduce the number of additional or alternative accesses to MS. **Materials and methods:** The research includes 50 MSs with a pathological process mainly in anterior-medial areas with the following nosologies: fungal ball, retention cyst, foreign body and antrochoanal polyp. We have evaluated the visualization of the pathological process with and without using a 90° endoscope. **Results:** The 90° endoscope allows to reliably improve the visualization of MS in 40 cases (80%) when it takes place in the anterior regions. In 5 cases (20%) the visualization of the pathological process is fully achieved using a 70° endoscope. In 1 case (2%), an additional (prelacrimal) access was performed for the full reach of the instruments. **Conclusion:** the use of a 90° endoscope allows us to visualize anterior-medial areas of the MS which reduces the formation of additional approaches by improvement in visual control.



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Long-term effectiveness of extended endonasal endoscopic approaches in chronic rhinosinusitis with nasal polyps

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Background: Endoscopic sinus surgery (ESS) constitutes one of the main aspects in treatment of chronic rhinosinusitis with nasal polyps (CRSwNP). Different surgical approaches have been described, but the accurate evaluation of extension and its effectiveness in terms of QoL, healing and revision surgery rates is becoming mandatory. Methods: Moderate-to-severe CRSwNP patients were selected for a retrospective cohorts' study in two groups: extended ESS versus functional ESS. Endoscopic, radiological and clinical outcomes were compared from baseline to 2-years after ESS. Multivariate linear regression model was calculated to assess potential confounding effect estimates, being the main outcome of interest the SNOT-22 relative change. To identify the features most strongly associated by obtaining the minimal clinically important difference (MCID), a multivariate logistic regression algorithm was performed. Results: 274 patients were included. NPS, Lund Mackay and SNOT-22 showed significant differences before and after surgery in both groups, with higher improvement in extended ESS group. A significantly increase of 14.8 units in SNOT-22 for patients undergoing extended surgeries was observed by linear regression. In multiple logistic regression model, an achievement of MCID was associated with extended ESS (OR=6.49) and history of previous ESS (OR=0.17). Conclusion: Extended ESS is a more effective treatment of moderate-to-severe CRSwNP, providing better endoscopic, radiological and QoL outcomes two-years after surgery, irrespectively of different phenotypes.

1710

Radiological and Intraoperative Findings in Revision Endoscopic Sinus Surgery – Do we fail in primary surgery?

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Introduction Functional Endoscopic Sinus Surgery (FEES) is widely accepted as an effective surgical procedure for treatment of chronic rhinosinusitis refractory to medical therapy. However, aggressive disease and/or anatomical variables can cause a recurrent or persistent mucosal disease, leading to a revision surgery. **Objective** To describe the radiological and intraoperative findings of patients that underwent revision endoscopic sinus surgery. **Methods** Retrospective review of patients that went under FEES surgery between January 2017 and December 2022 in a tertiary hospital. **Results** A total of 50 nasal cavities were revised. Two-thirds were female and mean age was 54.2 years old. Patients underwent primary surgery 60 months before, on average (n=28). 83.3% underwent surgery due to recurrent disease and 16.7% due to complications attributed to primary surgery (mucocoeles). The most frequent radiological and intraoperative findings were incompletely removed cells in frontal recess (86.6%), incomplete anterior ethmoidectomy (48.0%), presence of agger nasi (34.0%), incomplete posterior ethmoidectomy (26.0%) and neo-osteogenesis (18.0%). Three minor complications were recorded. **Conclusions** Most revision cases were performed due to persistent or recurrent sinus disease. Nevertheless, systematic findings in those patients suggest that incomplete dissection of some bony structures in primary surgery can be part of the problem. Before a revision surgery, the surgeon should carefully analyze the sinus CT scan to anticipate potential failures of the primary surgery.

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Open approach and reconstruction techniques on nasosinus tumors – impact on the nasolacrimal system

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Introduction: Open approaches to sinus lesions are used for decades. Recently, reconstruction techniques have been added to improve aesthetics, solve complications and avoid loss of function. However, these reconstruction techniques can compromise the lacrimal drainage. **Objective:** To identify factors contributing to obstructive nasolacrimal symptomatology in patients submitted to open approach and reconstruction techniques in the treatment of nasosinus tumors. **Methods:** A retrospective study was performed identifying patients submitted to open-approach techniques to treat nasosinus lesions in a tertiary oncology center. Data regarding etiology, staging, approach, the extent of the maxillectomy, orbital floor implantation, and other reconstruction techniques were collected and analyzed in SPSS version 28. **Results:** We included 48 patients in the study. Of these, 12 out of 23 (52%) patients submitted to reconstruction techniques (including orbital floor reconstruction, temporal flaps, scapular flaps, or septal flaps) and 3 out of 25 (12%) patients with no reconstruction techniques, showed obstructive symptoms of the lacrimal system. **Discussion/Conclusion:** The results of the group not submitted to reconstruction techniques are similar to previous studies. A comparison between this group and the group submitted to reconstruction techniques showed a higher percentage of the latter. This may result from inflammation, synechia presence, or direct obliteration of the nasolacrimal duct. When opting for reconstruction techniques, the nasolacrimal system should be reminded.

Snoring and OSA 1

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Gender-specific association between obstructive sleep apnea and cognitive impairment among adults

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Snoring and OSA 1 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

To explore the gender-specific association between obstructive sleep apnea (OSA) and cognitive impairment. Participants from UK biobank who have completed at least one of the five baseline cognitive tests were included, which were initially divided into two groups based on gender and were further categorized into three subgroups: OSA, self-reported snoring but without OSA, and healthy controls (without OSA or snoring). Multivariable regression analysis was performed to examine the associations among snoring, OSA and performance of each of the five cognitive domains. A total of 267,889 participants (47% male, mean age: 57 years old) were included in our study. In the multivariable regression analysis, female participants in the OSA group had a higher risk of having poor prospective memory (OR: 1.24, 95% CI: 1.02~1.50, $p=0.03$). Meanwhile, OSA were inversely associated with the performances of fluid intelligence (β : 0.29, 95% CI: 0.46~-0.13, $p<0.001$) and short-numeric memory (β : 0.14, 95% CI: 0.35~0.08, $p=0.02$). Besides, age-related subgroup analyses showed that these associations were largely reserved in younger (<65 years old) female participants rather than older female participants. In contrast, among male participants, no significant association was observed between OSA and impairment of the five cognitive domains. OSA was significantly associated with cognitive impairment at certain dimensions in female participants rather than in male participants, indicating that more special attention and timely interventions should be given to younger female OSA patients.

1202

Self-reported snoring and risk of incident gastro-esophageal reflux disease in the UK Biobank

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Snoring and OSA 1 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Introduction: The association between snoring and gastro-esophageal reflux disease (GERD) remains unclear. **Methods:** UK Biobank participants recruited during 2006 and 2010 with self-reported snoring information available were included, and individuals who were diagnosed with GERD at recruitment were excluded. The follow-up information included data available until 2021. Univariate and multivariate logistic regression models were used to assess the association between self-reported snoring and GERD. Subgroup analyses stratified by sex and body mass index (BMI) categories were conducted, and the interactions between snoring and sex/BMI were evaluated. Sensitivity analyses using more stringent definition of GERD were conducted to test the robustness of the results. **Results:** A total of 429,064 participants were included, with 29,697 developed GERD during follow-up. Snoring was associated with a higher risk of GERD (odds ratio, OR=1.12, $p<0.001$), and this association was more prominent in females than that in males (males: OR=1.06, $p=0.049$; females: OR=1.17, $p<0.001$, p -value for interaction <0.001), while no significant effect differences were observed in participants with different BMI categories (p -value for interaction=0.26). Consistent results were observed in sensitivity analyses of different GERD definition. **Conclusion:** There was a robust higher risk of incident GERD in participants with self-reported snoring compared with those without snoring, with the trend more obvious in females.



1206

DISE with PAP: A method for better compliance and individualized treatment of patients with OSA

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Snoring and OSA 1 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

IntroductionIn this study, we aimed to observe the effects of positive airway pressure (PAP) on individual levels of obstruction during drug-induced sleep endoscopy (DISE) of the upper airways (UA), to evaluate at which pressures the obstruction disappeared or worsened, and to identify cases in which PAP was ineffective. **Methods**This prospective study was conducted from June 2018 to December 2022. PAP testing was performed during DISE in patients with moderate and severe OSA. The pressure was gradually increased in the range from 6.0 to 18.0 hPa. Our findings were evaluated using the VOTE classification. **Results**The examination was performed in 56 patients, with a median apnea-hypopnea index (AHI) of 26.4. Complete obstruction of the soft palate was observed in 51/56 patients (91%), oropharyngeal obstruction in 15/56 patients (27%), tongue base obstruction in 23/56 patients (41%), and epiglottic collapse in 16/56 patients (29%). PAP was most effective in cases of complete oropharyngeal obstruction, where the mean opening pressure was 11.1 hPa. PAP was least effective in cases of epiglottic collapse, where it was ineffective in 11/16 patients. **Conclusions**DISE and PAP is a simple diagnostic method, which can be helpful for identifying anatomic and dynamic reasons for PAP intolerance. The main indication is ineffective PAP treatment.

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Obstructive sleep apnea and interstitial lung disease overlap syndrome: A new underestimated and undertreated syndrome entity.

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Snoring and OSA 1 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

INTRODUCTION Interstitial lung diseases (ILDs) are a group of heterogeneous disorders characterised by varying degrees of fibrosis and inflammation of lung parenchyma. Obstructive sleep apnoea is a type of sleep disordered breathing characterised by repeated episodes of apnoea and hypopnoea during sleep due to narrowing or occlusion of the upper airway. Studies conducted in the western world have found the prevalence of OSA to be around 80% among patients with idiopathic pulmonary fibrosis (IPF). **RESULTS** Eighty-one obese patients with ILD and BMI above 37 (55 females and 26 males, mean age 67.8 ± 9.2) were studied. The mean BMI was 39.4 ± 2.4 . Out of 81 obese patients diagnosed as ILD, 66 (81.5 %) were diagnosed to have OSA by overnight PSG. The mean forced expiratory volume in first second (FEV1) /forced vital capacity (FVC) was 79.14 ± 3.673 . Forced vital capacity (FVC) 58.80 ± 16.192 % predicted. Blood gas analysis presented a mean pH of 7.41 ± 0.02 , a mean PO₂ of 45.14 ± 9.25 mmHg, and a mean PCO₂ of 53.06 ± 14.676 mmHg. Echocardiographic assessment of all studied group revealed ejection fraction EF 61.23 ± 6.489 and pulmonary artery systolic pressure PASP 44.58 ± 18.258 . All the patients underwent overnight complete polysomnography. Diagnosis of OSA was based on (AHI) >5 on PSG as per guidelines of the American Academy of Sleep Medicine. The mean AHI of all studied group was 24.63 ± 13.776 . All studied subjects underwent radiological assessment with high resolution computed tomography HRCT Chest and severity of interstitial affection was classified according to into: Mild 21 patient 25.9 %, Moderate 27 patient 33.3%, Severe 17 patient 21.0%, Honeycombing 8 patient 9.9%, Advanced honeycombing 8 patient 9.9%. Correlation between AHI and HRCT Chest revealed significant relation as regards presence of honeycombing and advanced honeycombing in HRCT: mild HRCT pattern mean. 18.67 ± 9.409 Pvalue.939, Moderate HRCT pattern mean 17.70 ± 13.845 Pvalue.939, Severe HRCT pattern mean 27.82 ± 10.187 Pvalue.045, Honeycombing HRCT pattern mean 42.00 ± 4.27 Pvalue.000, Advanced honeycombing HRCT pattern mean 39.50 ± 5.880 Pvalue.000. Insignificant correlation was found between RDI and all parameters of functional assessment of ILD as regards PCO₂, PO₂, FEV1/FVC, FVC, EF, PASP: Pvalue 0.748, Pvalue 0.469, Pvalue 0.040, Pvalue 0.020, Pvalue 0.114, Pvalue 0.258, Pvalue 0.768 respectively. IPF constituted most of the patients (n=56) followed by connective tissue disease (n=11), hypersensitivity pneumonitis (n=14). **CONCLUSION** There was a high incidence rate of OSA in obese patients with ILD. The results of the present study show that all obese patients with ILD should be screened for OSA at the time of initial evaluation.

1650

Is there a correlation between nasal symptoms and CPAP usage in patients with obstructive sleep apnoea? A prospective cohort study.

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Introduction: The role of nasal symptoms in continuous positive airway pressure (CPAP) adherence is not completely clear. The aim of this study was to investigate the correlation between nasal symptoms and CPAP usage in patients with obstructive sleep apnoea (OSA). **Methods:** Two hundred thirty patients were studied and divided into high-, low-, and non-CPAP users. Predictive factors for CPAP usage were investigated. Nasal symptoms and related quality of life parameters were evaluated prior to CPAP initiation and after three months. **Results:** There were significantly worse baseline scores for rhinorrhoea in non-CPAP users compared with high and low users (1.34 vs. 0.68 and 0.75, respectively, $p = 0.006$). There were no other significant differences between the groups. Rhinorrhoea was an independent predictive factor for lower CPAP usage ($p = 0.036$). There was a worsening in rhinorrhoea score in high-CPAP users ($p = 0.025$) but not in low- and non-users at the three-month assessment. There were no significant changes in other nasal symptoms. **Conclusions:** This study reveals that runny nose was the only symptom associated with poorer CPAP adherence. Furthermore, runny nose worsened after a three-month trial of high-CPAP usage.



1703

Innovative and cost-efficient methods for the prediction of obstructive sleep apnoea

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Objective Our aim was to investigate the applicability of artificial intelligence (AI) for the prediction of obstructive sleep apnoea (OSA), based on simple anthropometric, demographic and questionnaire parameters. Our research objective was to develop a simple, practical and reliable prediction system. **Methods** The 100 patients were divided into control-, and mild, moderately severe-severe OSA-groups based on the results of the polysomnography performed. The Berlin and Epworth questionnaires were completed and anthropometric measurements were performed. **Results** AI OSA prediction for evaluation of BMI, age and gender yielded an 81% accuracy of classification while the accuracy of OSA severity categorization based on the same parameters was 64%. With the completion of the questionnaires accuracy increased to 83%. The Berlin questionnaire alone yielded a correct OSA prediction in 62%, while the Epworth questionnaire in 75% of all cases. The best results for categorization by severity were obtained by combining age, gender and BMI parameters, and responses to the questionnaires (71%). This result improves slightly supplemented with neck circumference (73%). **Conclusion** The AI evaluation of demographic data and anthropometric parameters as well as questionnaire-based results offers a cost-effective and rapid diagnostic alternative in primary care and for postoperative risk assessment of previously undiagnosed OSA patients.

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Increased tissue necrosis and fibrosis without epithelial injury of high-intensity focused ultrasound treated tonsil

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Snoring and OSA 1 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Introduction A non-invasive High-intensity focused ultrasound (HIFU) ablation may be a good option for alternative treatment to reduce tonsillar hypertrophy in obstructive sleep apnea (OSA). **Method** Consecutive in-vivo stimulations of HIFU to palatine tonsils of three living pig models (*Sus scrofa*, weighing approximately 20 kg each and aged 1–2 months) were performed. Stimulations were performed at baseline (pig 1,2,3) and were repeated after 2 weeks (pig 2,3) and 4 weeks (pig 3). Thickness of the palatine tonsil were measured by ultrasonography. Histological analyses were performed, with Sirius red staining, immunohistochemistry with TGF- β 1, and TUNNEL staining. Additional ex-vivo stimulation of 7 human tonsil tissue was performed right after completion of tonsillectomy. **Result** No surface lesion had been identified after the stimulation. The thickness of tonsil decreased with repeated HIFU treatment. On histological analysis, epithelial layers were all intact. Higher amount of tissue fibrosis were noted from the HIFU stimulated tonsil tissue compared to control tissue. In tunnel staining, the mean intensity ratio of ablated tonsils were higher compared to control tonsil. Ex-vivo stimulation of human tonsil also revealed a significantly higher mean intensity in HIFU ablated tissue. **Conclusion** HIFU stimulation of palatine tonsil reduces tonsil size by inducing tissue necrosis followed by increased fibrosis without epithelial injury. Therefore, HIFU may be an alternative treatment option for palatine tonsillar hypertrophy in OSA patients. Our results warrant further human cl



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The role of drug induced sleep endoscopy in the indication of surgical therapy in obstructive sleep apnoe syndrome

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Snoring and OSA 1 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Introduction: The two cornerstones of obstructive sleep apnoe syndrome (OSAS) diagnostics is the sleep study performed by a somnologist, which determines the severity of the complaints, and the drug induced sleep endoscopy (DISE), which provides a topodiagnosis. **Methods:** A 5 year retrospective study of patients with OSAS (N=292). The authors introduced the basic principles of DISE, the results of topodiagnostic examinations and the ratio of the main types of surgery indicated. **Results:** In childhood, OSAS is primarily caused by adenoid and tonsillary hyperplasia, while in the case of congenital developmental disorders, changes in the hypopharynx and larynx are the most common. In childhood (14%) the most frequent intervention were adenotomy 82%, tonsillotomy 59% and lingual tonsillotomy 11%. In adults (86%), the obstruction is usually multifaceted therefore, the solution can be simultaneous or multilevel surgery. Most common interventions: septoplasty 34% with anterior inferior turbinoplasty 33-39% followed by uvulo-palato-pharyngoplasty 29% and lingual tonsillotomy 18%. **Conclusion:** Children with Friedman Grade II–III tonsils exhibit "kissing tonsils" and signs of obstructive sleep apnea syndrome a few months after adenotomy. When adult patients who underwent tonsillo-adenotomies as children present with obstructive sleep apnea syndrome, the enlargement of the lingual tonsils is typically the underlying cause.

Skull base surgery 2 / CSF leaks and management

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Bipolar high frequency electric welding of dural defects in radical resection of frontal sinus tumors with intracranial invasion

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Skull base surgery 2/ CSF leaks and management | Room 12 Hall 40 - Level 6 | Tuesday
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The aim of study is to develop a new method of connecting the dura mater (DM) defects in frontal sinus tumors with intracranial spread, which would allow to avoid intra- and postoperative complications as much as possible. Depending on the method of dura mater defect repair, patients were divided into 2 groups (62 patients). The 1st group (N=29) (control) included patients whose DM defects was connected according to the conventional method (suturing with polypropylene threads), in the 2nd group (N=33) – the DM defects was connected by high-frequency bipolar electric welding. We propose an effective method of connecting the DM defects after the removal of frontal sinus tumors spreading intracranially. This was possible due to the supply of current with certain wave characteristics in a certain modulation at a temperature of 40-48°C, resulting in the connection of tissues without the formation of a coagulation scab due to the mechanism of protein-associated electrothermal adhesion of tissues. We studied all clinical indicators, studied the frequency of postoperative liquefaction in both groups of patients. We've also studied the peculiarities of the structure of the tissues of the junction of the DM and the DM with fascia lata, connected by high-frequency bipolar electric welding, by morphological methods and methods of confocal infrared spectroscopy. Presented data indicate significant advantages of using high-frequency bipolar electric welding to restore DM, compared to the traditional suture method. This approach has reduced intra- and postoperative complications, the time of surgery, and the length of the postoperative period.



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Unilateral nasal mass: a meningoencephalocele case report

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Skull base surgery 2/ CSF leaks and management | Room 12 Hall 40 - Level 6 | Tuesday
20/06/2023

Introduction: Nasal meningoencephalocele (NM) is a herniation of the cranial contents (meninges and brain tissue) into the nose through a skull-based defect. This is an uncommon condition, and could be congenital, traumatic or spontaneous. **Case report:** A 63-year-old female, diagnosed with arterial hypertension, chronic renal dysfunction and obstructive sleep apnea, presented at the emergency with a severe frontal headache at left side, as aggravating factors she identified the orthostatic position and Valsalva maneuver. For the past four years she had a left unilateral nasal discharge and hyposmia that she related to a car accident years before. At the nasal endoscopy, in the left nostril, was seen a whitish, vascularised, pulsatile mass with apparent origin at the ethmoidal roof, medial to the middle turbinate, and a clear fluid at the anterior side of the mass. The beta-trace protein test performed on nasal secretions was compatible with cerebrospinal fluid (CSF). The paranasal sinuses computed tomography scan showed, on the left, a cribriform plate fracture apparently related to the nasal mass. The magnetic resonance imaging scan suggested a left NM. A endoscopic nasosinus surgery (ENS) was performed with closure of the CSF fistula. **Conclusion:** The patient's history, physical examination findings and imaging are essential for the differential diagnosis of a unilateral nasal mass, allowing the diagnosis of a rare entity such as meningoencephalocele. ENS is effective and safe for meningoencephalocele approach and for CSF fistula repair.

1573

Ecchordosis physaliphora: Five case reports and brief review of the literature.

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Skull base surgery 2/ CSF leaks and management| Room 12 Hall 40 - Level 6| Tuesday
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Ecchordosis physaliphora (EP) is a rare, benign hamartomatous remnant of the vestigial notochord that can be found across the craniospinal axis, most commonly posterior to the superior clivus. In the vast majority of cases it represents an incidental radiological finding. However, EP may occasionally become symptomatic and be associated with mass effect due to compression of brainstem or cranial nerves or with cerebrospinal fluid leak with recurrent meningitis due to clival defect. In such cases surgical treatment is necessary. In this study we report the radiological signs and clinical symptoms of five patients with symptomatic retroclival ecchordosis physaliphora (four male, age range : 34 to 82) : Four of these patients presented with CSF rhinorrhoea while three were admitted with acute bacterial meningitis. All of them were treated with endoscopic endonasal transsphenoidal transclival approach and reconstruction of the clival defect. The aim of this study is to underline the importance of a timely diagnosis of this rare entity as it can easily be missed due to its small size and rarity. An endoscopic endonasal transsphenoidal / transclival approach facilitates the complete excision of these lesions, as well as the 3-layer reconstruction of the skull base defects, with minimal morbidity.



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Salvage endoscopic endonasal surgery of Skull base osteoradionecrosis

Zhaohui Shi, Tianfeng Zhao

Skull base surgery 2/ CSF leaks and management | Room 12 Hall 40 - Level 6 | Tuesday
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Objectives: Skull base osteoradionecrosis was a potential lethal post-radiation complication with low incidence. We aimed to report a single-center salvage endonasal endoscopic surgery results, evaluate its clinical efficacy and share our surgical experience. **Methods:** We conducted a retrospective, observational study of 9 skull base ORN patients with ICA involved from the year 2017 to 2019. We identified the involved segment of carotid artery by computerized tomogram and surgical confirmation. During the surgery, we achieved anatomical exposure of different parts of ICA. We collected clinical data including demographic information, pathology results, reconstruction method and calculated the surviving time, mortality rates of this surgery, and complication rates. the endpoint was an overall survival (OS) rate of 2 years. To verify the efficacy of this aggressive surgery, we compared verbal rating score (VRS) of headache by utilizing Wilcoxon rank-sum test. **Results:** A total of 11 patients were diagnosed, 9 of whom were enrolled in the study; the mean age was 53.3 years. Among them, 7(77.7%) were nasopharyngeal carcinoma (NPC), 1(11.1%) squamous cell carcinoma (SCC) of the sphenoid sinus, and 1(11.1%) adenoid cystic carcinoma (ACC). 1 death resulted from severe parapharyngeal space infection within 2 months after the surgery. The median follow-up time was 39.33 months. The OS rate was 88.9% during the 2-year study. Wilcoxon rank-sum test showed the mean rank decreased after the surgery. ($Z=-2.719$, $P=0.007$) **Conclusion:** Skull base salvage debridement surgery will be beneficial



1657

Endoscopic endonasal approach for trigeminal schwannomas: our experience of 39 patients in 10 years

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Background:The anatomical locations involved in trigeminal schwannomas (TSs) are quite complex. Given the nerve function recovery and postoperative neurological deterioration varied in different reports, the author demonstrates his surgery tips and the functional outcomes under endoscopic surgery. **Methods:** A retrospective review of patients with TSs was undertaken to assess the outcome of endoscopic surgery from 2006 to 2016. Clinical features, imaging findings, preoperative/postoperative neurological deficits, surgical approaches and followed up data were collected. **Results:** Thirty-nine patients with TSs were included. Surgical approaches include endoscopic medial maxillectomy approach (n=8), endoscopic endonasal-assisted sublabial transmaxillary approach (n=27) and endoscopic endonasal-assisted sublabial transmaxillary combined with septectomy (n=4). Gross total resection and sub-total resection were achieved in 27 and 10 patients, respectively. The most common chief complaint was facial numbness, accounting for 41%, with a resolved rate of 62.5% after treatment. Fifteen patients developed new neurologic symptoms, including facial numbness/pain (n=9 and 2, respectively), dry eye (n=3) and mastication weakness (n=1). Eight of these patients had partial improvement except for patients with dry eye. **Conclusion:** Endoscopic endonasal approach represents a safe and effective surgical procedure for TSs in pterygopalatine fossa, infratemporal fossa and even Meckel cave. Tumor resection can be achieved by endoscope with few neurologic deficits and complications.



1660

Endoscopic endonasal resection and radiotherapy as treatment for skull base chordomas

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Skull base surgery 2/ CSF leaks and management| Room 12 Hall 40 - Level 6| Tuesday
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Objective: We investigated the effect of endonasal endoscopic surgery and radiotherapy as treatment for skull base chordomas. **Method:** We investigated 46 patients (2006–2018) treated at the Affiliated Eye Ear Nose and Throat Hospital, Fudan University. We documented demographics, clinical presentation, operative resection, complications, postoperative radiotherapy, follow-up time, and survival. **Result:** Complete tumor resection was performed in 18 (39.1%), subtotal tumor resection in 16 (34.8%), and partial tumor resection in 12 (26.1%) patients. The most common clinical manifestation was nasal obstruction (41%). The median duration of progression-free survival (PFS) and overall survival (OS) was 21.5 and 33.5 months, respectively. Primary vs. recurrent disease, partial resection (PR) vs. subtotal resection (STR), STR vs. gross total resection (GTR), GTR vs. PR, and complicated vs. uncomplicated status were significantly associated with PFS. Primary vs. recurrent disease, PR vs. STR, GTR vs. PR, surgery alone vs. surgery concomitant with radiotherapy, and complicated vs. uncomplicated status were significantly associated with OS. **Conclusion:** Surgery is the primary treatment for chordoma; higher tumor resection rates are associated with higher OS and PFS. Surgeons should aim to resect as much tumor as is safely possible. Postoperative radiotherapy is useful adjuvant treatment to improve OS, and IMRT serves as an effective alternative to PBRT. The optimal radiotherapeutic technique is determined by cost, accessibility, availability of the modality, and tumor volume.



1684

Contralateral Transorbital Endoscopic Approach to Petrous Apex: A Feasibility Cadaver Study

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Skull base surgery 2/ CSF leaks and management| Room 12 Hall 40 - Level 6| Tuesday
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Objective: Petrous apex(PA) of the temporal bone is an anatomically challenging area to access. Nowadays in suitable cases minimal invasive ventral approaches is the preferred approach. The aim of this anatomic study is to compare and combine contralateral transorbital endoscopic approach with EEA to get full access to the petrous apex and to describe technical notes. And defining an improved approach and direct visualization of the surgical field, with limited morbidity. **Methods:** 3 human cadaver heads (6 sides) were dissected. Endoscopic dissection through purely endonasal endoscopic route and a combined with contralateral transorbital route were done. **Results:** The two minimally invasive approach (endonasal endoscopic and contralateral transorbital) to petrous apex let us have different degree of visualization to the PA. Contralateral transorbital approach to PA makes it possible to visualize ICA better and widely. A combined approach makes it possible to remove bone and to reach PA fully without a need for a curved instruments and drills. In suitable cases with reduced Palluzzi angle, this approach may help to overcome the difficulty of to reach PA. **Conclusion:** Surgical approach to PA is challenging. Combined approach with endonasal and contralateral transorbital route provides a good access to control to petrous apex and internal carotid artery even without curved instruments. This combined approach may be especially useful if there is no access to curved endoscopic instruments and drills. Possibly pioneer clinical applications are necessary



1706

Infratemporal Fossa and Pterygomaxillary Tumours: Experience from a Tertiary Medical Center

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Skull base surgery 2/ CSF leaks and management | Room 12 Hall 40 - Level 6 | Tuesday
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Introduction: Tumours involving the infratemporal fossa (ITF) are rare and the majority result from extension from adjacent spaces. They have distinctive presentations and the diagnosis is crucial in planning a treatment strategy. **Objectives:** Consecutive case series report regarding ITF and pterygomaxillary space (PMS) lesions. **Methods:** Descriptive retrospective study of patients presenting with ITF/ PMS lesions in a tertiary medical center, between January 2017 and January 2023. **Results:** A total of 19 patients were included, with a mean age of 61,3 years (13-81 years) and 57,9% were male. The most common presentation was nasal obstruction (42,1%), headache (36,8%), rhinorrhea and visual symptoms (21.1% each). Plasmacytomas (21,1%) and juvenile nasopharyngeal angiofibroma (15,8%) were the most common tumours. 63,2% patients (n=12) performed surgical resection, 8 of them (66,7%) were selected to pure endoscopic endonasal approach (EEA) and 4 needed cranio-endoscopic approach (33.3%). A total of 3 (27,3%) underwent preoperative embolization. Total resection was achieved in 10 patients (83,3%) and near-total in 2 with a rate of 1,3 surgeries per patient. 4 patients (33,3%) had adjuvant chemo/ radiotherapy and the mean follow-up time for surgical patients was 38,7 months (1-118 months). 5 patients (26,3%) were selected to receive medical treatment upfront and 2 are awaiting surgery. **Conclusions:** In this study, the EEA proved to have the advantage of being minimally disruptive with excellent endoscopic control and contributed extensively to achieve total or near-total resection.

1773

PosESS-Study (Positioning in Endoscopic Skull Base Surgery): Semi-Sitting Versus Supine: Interim Analysis of a Randomized Controlled Trial

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Skull base surgery 2/ CSF leaks and management | Room 12 Hall 40 - Level 6 | Tuesday
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Endoscopic endonasal pituitary surgery is standardly performed with the patient in supine position. In semi-sitting position, the intracranial pressure is lower than in supine position due to decreased venous congestion. Aim of the study is to compare the supine and the semi-sitting position in endoscopic endonasal pituitary surgery. Methods: This study is a prospective randomized clinical trial. Inclusion criteria are as follow: adult patients with a presumed pituitary adenoma, who are suitable for endoscopic endonasal surgical resection. The primary outcome is intraoperative bleeding, assessed by the blood loss and the frequency of hemostatic maneuvers. Secondary outcomes include surgical ergonomics and the incidence of air embolism. Results: 36 patients (60% of the expected 60 patients) have been randomized so far. The mean blood loss was 201ml (± 132) in the semi-sitting vs. 291ml (± 159) in the supine group (reduction of 31%) ($p=0.06$). The mean frequency of hemostatic maneuvers was 86 (± 27) in the semi-sitting vs. 121 (± 44) in the supine group (reduction of 30%) ($p=0.01$). There were no significant differences in the incidence of air embolism (3 (21.4%) in the semi-sitting vs. 0 (0%) in the supine group ($p=0.23$)) and no difference in the surgical ergonomic score (29/32 (± 4) in the semi-sitting vs. 30/32 (± 2) in the supine group ($p=0.61$)). Discussion: The hypothesized decrease in intraoperative bleeding may enhance the surgical workflow.



Benign Nasal Tumors 1

1197

PREOPERATIVE PREPARATION OF PATIENTS WITH JUVENILE ANGIOFIBROMA

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Benign Nasal Tumors 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

Abstract. Today, the prevalence of juvenile angiofibroma is about 0.05% of all head and neck tumors. Juvenile angiofibroma occurs in the nasal cavity and nasopharynx only in men aged 9 to 19 years. It was believed that hormonal and genetic factors contribute to the occurrence of juvenile angiofibroma in young men, but recent studies have shown conflicting data on hormonal effects. There were no direct links between the proliferative index, hormonal level, age at the time of diagnosis and the stage of the tumor or bleeding. Thus, the significance of induced testosterone levels in tumor development remains unclear. Histological diagnosis of juvenile angiofibroma is usually not difficult. The main purpose of the study is to determine the most correct tactics of preoperative preparation of the patient. **Research methods.** We analyzed the clinical data of 11 patients with juvenile angiofibroma who received surgical treatment in our department from 2019 to 2023. **Results and conclusion.** Juvenile angiofibroma usually occurs in the posterior nasal cavity, near the basissphenoid and the upper edges of the wedgepalatine opening. The tumor demonstrates an expansive and destructive nature of growth. Healthy tissues are displaced and exposed to pressure. Preoperative assessment of the size and location of the tumor includes: endoscopic examination of the nasal cavity, CT, MRI and angiography of the vessels of the head and neck.

1205

Quality-of-Life Outcomes Following Surgical Treatment of Sinonasal Inverted Papilloma: A Multicenter Analysis

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Introduction: There is growing interest in assessing patient quality-of-life (QOL) following treatment of sinonasal tumors, including inverted papilloma (IP). In this study, we aimed to elucidate the natural history of postoperative QOL outcomes in IP patients treated with surgery. **Methods:** Cases of sinonasal IP treated surgically at 4 tertiary academic rhinology centers were retrospectively reviewed. SNOT-22 scores were used to evaluate QOL preoperatively and postoperatively (1, 3, 6, 12 months). Repeated measures ANOVA assessed for differences in mean scores over time. Linear regression identified factors associated with QOL longitudinally. **Results:** 373 patients were analyzed. Mean preoperative SNOT-22 score was 20.6 ± 20.4 , which decreased to 16.3 ± 18.8 ($p=0.041$) and 11.8 ± 15.0 ($p<0.001$) at 1 and 3 months postoperatively, respectively. No further changes in SNOT-22 scores occurred beyond 3 months postoperatively ($p>0.05$). When analyzed by subdomain, nasal, sleep, and otologic/facial symptoms (all $p<0.05$) demonstrated improvement at 12-month follow up compared to preoperative scores; this was not observed for emotional symptoms ($p=0.80$). Recurrent cases were associated with higher long-term SNOT-22 scores ($\beta=7.08$; $p=0.017$). Age, sex, degree of dysplasia, prior surgery, primary site, and smoking history did not correlate with symptoms (all $p>0.05$). **Conclusions:** QOL outcomes related to IP resection are largely driven by nasal, sleep, and otologic/facial subdomains, though patients appear to experience enduring improvement as early as 3 months postoperatively.



1264

Endoscopic management of Advanced JNA: Tips & Tricks

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Benign Nasal Tumors 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

ENDOSCOPIC MANAGEMENT OF ADVANCED JNA: tips & tricks By: Hussam Elbosraty, MD, Prof. Kasr El-Ini Cairo University. Institution: Kasr El-Aini Hospital, Cairo University. Abstract: Juvenile nasopharyngeal angiofibroma (JNA) is a combined vascular and fibrous neoplasm which arises from the posterior-lateral wall of the nose. The tumor exhibits a strong tendency to bleed and, despite being microscopically benign, frequently exhibits destructive and aggressive behavior. Various treatment modalities are currently available for JNA, but surgical resection remains the best option. Recently, and after the advent of preoperative embolization many endoscopic trials were used to treat small JNA with great success. Still, however, the large Tumors remain a challenge. We describe our experience in 153 cases of endoscopic resection of advanced JNA including cases with intracranial intradural extension. Materials and methods: We describe our experience in 145 cases of endoscopic resection of advanced JNA including cases with intracranial extension. All the patients were adolescent males, the age ranges from 6 to 48 years. Tumor staging was 71 cases were stage III, 39 cases were stage IV and 43 cases were stage I and II. all cases were embolized 2 days pre-op. Results: complete tumor removal is achieved in 143 cases. incomplete removal in 10 cases. one case has been irradiated, the other 9 cases a 2nd session of endoscopic resection was done. 3 of these cases required a 3rd. session with no recurrence on the next 5 years. morbidity in the form of permanent loss of Eustachian tube dysfunction in



1306

The difference between HPV papilloma, Schneiderian papilloma and the other tumors in sinonasal cavity

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Schneiderian papilloma is typically found on the lateral nasal wall, but, in rare cases, can be located at the mucosa of the nasal septum. Respiratory epithelial tumors (REAH) in sinonasal cavity, characterized by an abnormal proliferation of glandular part of the respiratory nasal mucosa. The possible involvement of HPV in the aetiology of both benign respiratory papillomas and squamous cell carcinomas, a substantial number of studies have explored this issue. Typical clinical signs for this tumors usually are: nasal obstruction, rhinorrhea, epistaxis, and hyposmia. To date, 33.3% of sinonasal papillomas and 21.7% of sinonasal carcinomas analysed have been shown to be positive for HPV. Many elements of the data parallel the observations made in HPV lesions at other mucosal sites, such as malignant transformation and frequent recurrence after radical treatment; the fact that low risk HPV types 6 and 11 are usually confined to benign lesions, whereas the reverse is true for the oncogenic HPV types 16 and 18; and the presence of squamo-columnar junctions and squamous cell metaplasia in the sinonasal system. The discrepancies reported by several studies might result in part from technical reasons, but it is also possible that sinonasal lesions have a heterogeneous aetiology (HPV related and non-related) and/or that some novel (yet unidentified) HPV types exist in these lesions, which are detected by some studies but not by others.



1411

Transorbital approach for lateral frontal sinus lesions: Outcomes of 2 cases and anatomical considerations.

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The frontal sinus (FS) has been the most challenging sinus to approach with Endoscopic Sinus Surgery (ESS). The use of Draf III procedure has allowed surgeons to treat infectious, inflammatory, and neoplastic diseases affecting the FS. However, when lesions are located in the furthestmost lateral portion of the FS, external approaches are needed. The Transorbital Endoscopic Surgery (TOES) approach for the FS has become a strong tool in the armory of external FS surgery to successfully treat lateral lesions of the FS. Anatomic considerations must be taken in account to perform TOES of the FS. Materials: We described anatomic considerations to perform TOES of the FS and present two cases where lesions were treated with transorbital approach with adequate resection and successful outcome. One case is a lateral mucocele after a complex cranial trauma with TOES only approach. The second case is a large osteoma recurrence in the posterior wall of the left frontal sinus treated with a combined ESS and TOES approach. Conclusion: Transorbital endoscopic surgery of the frontal sinus is a useful and efficient approach to treat lateral lesions of the frontal sinus that are not able to be successfully treated by ESS only approach.

1493

Sinonasal inverted papilloma: Epidemiology, diagnostic features and treatment through a case series of a tertiary hospital.

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Background: Inverted papilloma (IP) is a benign epithelial tumor, with characteristic clinical and imaging findings¹, well known for recurrence and malignant transformation.²⁻⁴ Incidence varies between 0,2-1,5 new cases per 100.000 per year³, with a male:female ratio 2-5:12-4 and age of onset between 5th-6th decade of life^{2,3}. **Methodology:** We present our case series of IP patients during the last 5 years. **Results:** 22 cases of IPs (15:7 male:female, mean age 54,7 years) were diagnosed after clinical examination, imaging with CT or CT/MRI scan. A biopsy under local anesthesia was performed in 19 primary cases. The origin of IP was as follows: 11 maxillary sinus (50%), 3 lateral nasal wall (13,6%), 3 nasal septum (13,6%), 2 lamina papyracea (9,1%), 2 sphenoid sinus (9,1%) and 1 frontoethmoidal region IP (4,6%). All patients were treated with endoscopic sinus surgery with drilling of hyperostosis and followed up. 21/22 patients are disease free till today (2-60 months postoperatively). **Conclusions:** When unilateral, a nasal tumor should be promptly investigated with imaging studies, a biopsy and when diagnosis of IP is confirmed, a wide resection. Follow-up is demanded for at least 3 years. Chawla A, Shenoy J, Chokkappan K, Chung R. Imaging Features of Sinonasal Inverted Papilloma: A Pictorial Review. Curr Probl Diagn Radiol. 2016 Sep-Oct;45(5):347-53. doi: 10.1067/j.cpradiol.2015.10.004. Epub 2015 Nov 11. PMID: 26632214. Lund V, Stammberger H, Nicolai P. European position paper on endoscopic management of tumours of the nose and paranasal sinuses and skull base. Rhinology. 2010. 22(22). 30-31. Lisan Q, Laccourreye O, Bonfils P. Sinonasal inverted papilloma: From diagnosis to treatment. Eur Ann Otorhinolaryngol Head Neck Dis. 2016 Nov;133(5):337-341. Goudakos JK, Blioskas S, Nikolaou A, Vlachtsis K, Karkos P, Markou KD. Endoscopic Resection of Sinonasal Inverted Papilloma: Systematic Review and Meta-Analysis. Am J Rhinol Allergy. 2018 May;32(3):167-174



1512

A Rare Case of Sinonasal Glomangiopericytoma Treated with Endoscopic Sinus Surgery

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Benign Nasal Tumors 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

Sinonasal glomangiopericytoma (SNGPC) is a rare, borderline and low malignant potential soft tissue tumour, originating from the pericytes of the vessels of the nasal cavity. It accounts for 0.5 to 1.0% of all sinonasal tumors and it is a less aggressive and invasive variant of haemangiopericytoma. We report a case of a 76-year-old Caucasian female who presented to the ENT emergency department with recurrent episodes of unilateral epistaxis of the right side since one week. Nasendoscopy of the right nasal cavity revealed a pink, smooth, round mass, medial to the middle turbinate. A CT scan showed a 1.8 cm, hypodense, homogeneous circumscribed lesion attached to the cribriform plate, with no evidence of bony erosion. An endoscopic biopsy was taken and histopathology along with immunohistochemical staining demonstrated SNGPC. The patient underwent endoscopic intranasal excision of the tumor. Minimal intraoperative CSF leak from the lamina cribosa was repaired with an overlay mucosal free flap, DuraSeal and Spongostan. The patient had an uneventful recovery and was discharged on the 5th postoperative day. SNGPC must be differentiated from more aggressive lesions, such as glomus tumour, haemangiopericytoma or leiomyosarcoma or malignant melanoma. The mainstay of treatment is total surgical resection, which is considered sufficient for local disease control. Limited evidence supports the use of adjuvant therapies. Although the prognosis is favorable with a 90% 5-year survival rate, this tumor has a propensity for delayed recurrence. Hence, long-term follow-up is advocated.



1575

Surgical strategy for Juvenile nasopharyngeal angiofibroma in Onerci stage III

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Benign Nasal Tumors 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

Objective: to develop a surgical strategy for Juvenile nasopharyngeal angiofibroma (JNA) in Onerci stage III. **Methods:** Patients diagnosed as JNA Onerci stage III and undergoing endoscopic surgery from 2011 to 2016 was prospective enrolled. **Results:** Fifteen patients were enrolled. All were male and the average age was 16.4 years (10-31 years). Nine patients received angiography before surgery and eight of them received embolism. The mean follow-up time was 3.5 years (15-80 months). Recurrence was found in three cases, and endoscopic endonasal approach was performed in two cases, and one was received endoscopic endonasal approach combined with Caldwell Luc approach. The surgical strategy was: 1. The inferior turbinate and the lower part of the middle turbinate were resected to expose the upper and lateral surgical field. 2. Maxillostomy was performed and enlarged till the posterior wall of the maxillary sinus was fully exposed. 3. The posterior wall of the maxillary sinus was removed to expose the tumor in the pterygopalatine fossa and intratemporal fossa. 4. The anterior wall of the sphenoid sinus was resected to fully expose the tumor in the sphenoid sinus. 5. The tumor mobilized from the attached bone and nasopharynx. 6. The major feeding artery was identified and cauterized. 7. Removal of the tumor from the nose. 8. The vidian tube and basisphenoid were drilled. **Conclusion:** endoscopic endonasal approach is alternative for Onerci stage III JNA. The principle of the surgery is fully exposure and mobilization of the tumor before removal it.

CRS – diagnosis and investigations 2

1276

The presentations of eosinophilia in type 2 and non-type 2 CRwNP in Taiwan

Chih-Jaan TAI

CRS – diagnosis and investigations 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

Introduction: Chronic rhinosinusitis with nasal polyps (CRSwNP) are classified to type 1, type 2 and type 3 according to their inflammatory endophenotype. Type 2 inflammation accounts for the majority in Western countries' studies. Most of the etiologies are nonspecific, but some are related to genetic, metabolic and immune diseases, such as aspirin-exacerbated respiratory disease (AERD), allergic fungal sinusitis (AFRS), central compartment allergic disease (CCAD), etc. The purpose of this study was to compare the difference of clinical manifestations between patients in type II and non-type II CRSwNP, based on different diagnostic criteria, tissue or blood eosinophilia. Method: From February 2021 to July 2022, a total of 182 patients diagnosed with chronic rhinosinusitis and received FESS were included. Among which, 55 (30.22%) were CRSwNP, 127 (69.78%) were CRSsNP. According to the pathological tissue and blood eosinophil count, they were divided into type 2 and non-type 2 groups. Patient characteristics, allergic comorbidities, nasal polyps score (NPS), CCAD, CT L-M score, preoperative and postoperative olfactory and SNOT-22, and intraoperative blood loss surgical bleeding amount were analyzed. Results: The average age of 55 patients with CRSwNP was 45.7 years (24 to 66 years), and 37 (62.27%) were male. When based on histological diagnostic criteria, 43 cases (78.2%) are type 2 CRSwNP. However, when based on blood diagnostic criteria, 31 cases (56.4%) are type 2 CRSwNP. When based no histological diagnostic criteria, NPS, CCAD, CT L-M score, and intraoperative blood loss were higher in type 2 group than those in non-type 2 group. When based on blood diagnostic criteria, there was limited difference in NPS, CT L-M score, and intraoperative blood loss between the two groups. Conclusion: The patients with CRSwNP are mainly middle-aged male and their age is lower than that of the patients with CRSsNP. Whether based on histological diagnostic criteria or blood diagnostic criteria, more than half of the CRwNP were type 2 inflammation, which is different from the traditionally believe that the prevalence of type 2 CRSwNP is not high in Asian patients. The histological diagnostic criteria showed more differences between type 2 and non-type 2 CRSwNP in clinical manifestations, than the blood diagnostic criteria.

1293

TAS2R38 bitter taste receptors in CRS - new data on polish population

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CRS – diagnosis and investigations 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

Studies have shown differences in TAS2R38 receptor expression in patients with chronic rhinosinusitis (CRS) compared to healthy controls. Known agonists of TAS2R38 stimulate epithelial cells, leading to robust intracellular nitric oxide (NO) production, which damages bacterial membranes, enzymes, and DNA, but also increases ciliary beat frequency. We examined, using qRT-PCR, the expression of TAS2R38 receptor in nasal polyps (NP) of patients with CRS (N = 107) and in inferior turbinate mucosa (ITM) of patients with CRS and controls (N = 39), and confronted it with clinical features. The expression was shown in 43 (50.00%) samples of ITM in the study group (N = 107), in 28 (71.79%) in the control group (N = 39) (p = 0.037), and in 43 (46.24%) of NP. There were no differences in levels of the expression in all analyzed tissues. Patients who rated their symptoms at 0–3 showed higher TAS2R38 expression in ITM in comparison to the patients with 8–10 points on the VAS scale (p = 0.020). A noticeable, however not significant, correlation between the TAS2R38 expression in ITM and the Lund–Mackay CT score was shown (p = 0.068; R = –0.28). Patients with coexisting asthma had significantly higher receptor expression in the NP (p = 0.012). Our study is the first to confirm the presence of the TAS2R38 receptor in NP. Expression of the TAS2R38 receptor is reduced in the sinonasal mucosa in patients with more advanced CRS with NP.

1294

Sinonasal symptoms in COPD; burden and associations with clinical markers of disease

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CRS – diagnosis and investigations 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

Sinonasal symptoms are frequently reported in COPD and the prevalence of rhinosinusitis without nasal polyps (RSsNP) was 3-fold greater than in controls in a recent study. Knowledge of the relationship between sinonasal symptoms and clinical markers of COPD is limited. This study explores the associations between the burden of sinonasal symptoms and clinical markers. Methodology: Sinonasal symptoms were quantified with the rhinological subscale of the Sino-Nasal-Outcome-Test (SNOT-22) in 90 COPD patients characterized by the EPOS2012 criteria for RSsNP. Associations between a high burden, defined as a SNOT22_rhinological score of ≥ 11 , and the following markers were assessed by adjusted multivariable linear regressions; severity of dyspnea [modified Medical Research Council (mMRC)] and cough [Visual Analogue Scale], physical activity [6-minute-walking distance (6MWD)], mortality risk (BODE index), and HRQoL [disease-specific (CAT and SGRQ) and generic (PCS-SF36)]. Results: A high burden was associated with greater severity of dyspnea and cough, lower 6MWD, higher BODE index and poorer HRQoL. Conclusion: A high burden of sinonasal symptoms is positively associated with the clinical markers of symptom severity and mortality risk and is inversely associated with physical activity and HRQoL in COPD. This has clinical relevance, and enquiry about sinonasal symptoms should be incorporated into the clinical routine.



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Association between Helicobacter pylori and nasal polyps

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CRS – diagnosis and investigations 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

Background: Helicobacter pylori is the most common etiological factor of chronic infection worldwide. It has also been found in human dental plaques, mouth, saliva, tonsils and adenoid tissue, medial ear or nasal polyps and sinuses mucosa, as well in several benign and malignant lesions of the larynx and pharynx. Nasal polyposis is an inflammatory condition of unknown etiology. The etiological factors for nasal polyps include infection, inflammation or an imbalance of a metabolic pathway. Few years back, and these days GERD or Helicobacter pylori as a possible pathologic cause of nasal polyps is still increasing and often presented in cases that we are operating. Materials and Methods: With collaboration of department of Gastroenterology in our hospital, at period of 3 years (2017-2020) 24 patients with chronic rhinosinusitis from 34-68 years old with nasal polyps who had undergone nasal endoscopic sinus surgery were evaluated and detected association with helicobacter pylori. The investigation showed the presence of serum specific Helicobacter pylori antibodies (IgG and IgA) from the blood samples and feces controlled by ELISA and rapid urease tests of the biopsy specimens of the nasal polyps. Helicobacter pylori status was regarded as positive, if 2 (both) tests were positive. Results: 13 patients (7 women and 6 male) were positive of h.pylori (54,16%) Conclusion: Our recommendation is, that at diagnostic algorithm for CRSwP patients should be included helicobacter pylori tests, and treatment management therapy for it.

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Deep Learning Model for Endoscopic Chronic Rhinosinusitis Endotypic Classification Using Preoperative Diagnostic Nasal Endoscopy Images

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CRS – diagnosis and investigations 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

Chronic rhinosinusitis (CRS) is a complex heterogeneous disease with different phenotypes and endotypes. The advances in our understanding of the pathogenetic mechanisms of CRS endotypes have resulted in broader insight into the disease mechanisms and allowed for better orientation of therapy. The EPOS 2020 reflects these changes with updated CRS classifications and new integrated care pathways. The current approach proposes the differentiation between type 2 and non-type 2 inflammatory responses. Histopathological CRS subtyping by tissue eosinophilia has prognostic and therapeutic implications. Data derived preoperatively regarding the endotypic nature of the disease can significantly influence treatment selection and course of disease. Considering the strong feature extraction and screening ability of artificial intelligence, applying this technology to diagnostic nasal endoscopy may allow preoperative differentiation between eosinophilic CRS (ECRS) and non-eosinophilic (NECRS). Objective: This study aims to determine if a convolutional neural network could be trained on preoperative transnasal endoscopic images to classify and differentiate between ECRS and NECRS. Methods: A series of nasal endoscopic images will be obtained from healthy individuals and patients undergoing functional endoscopic surgery for CRS confirmed by histopathology. A deep neural network model will be applied for feature selection and classification of images. Performance will be evaluated for accuracy and precision. Clinical significance: Non-invasive diagnostic tool for preoperative CRS subtyping



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**BLOOD AND NASAL EOSINOPHILIA IN CHRONIC RHINOSINUSITIS WITH NASAL POLYPS:
MAY THEY PREDICT SEVERITY OF DISEASE?**

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CRS – diagnosis and investigations 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

The objective of this study is to evaluate the role of blood and local eosinophilia (at nasal cytology) to define in practice type-2 inflammation and severity of disease in CRSwNP. This is a cross-sectional multicentric observational study including 425 CRSwNP patients. For each patient, we collected data on blood eosinophilia, nasal cytology, asthma and severity of disease assessed by VAS- symptoms and SNOT-22. In our series 274/425 (64%) patients had local eosinophilia at nasal cytology and 303/425 (71%) had blood eosinophilia (>250 units/microliter). The 35% (43/122) of patients with no blood eosinophilia had a local eosinophilic infiltrate detected by nasal cytology. Regarding severity of disease, patients who have a local eosinophil count > hpf have a significant mean SNOT-22 score compared to the ones with < 5 hpf (51 vs 37). Moreover, patients with eosinophil count > 5 hpf had a significant higher median specific VAS for nasal obstruction, rhinorrhea, smell impairment and watery eyes. Patients with comorbidities (asthma, allergic rhinitis, N-ERD) had a higher mean local eosinophilic count than patients without it. We did not observe a correlation between peripheral and local eosinophilia; furthermore, blood eosinophilia was not correlated with severity of symptoms. Our data suggest that local eosinophil count is clinically important both to define type-2 CRSwNP and to focus on more severe patients.

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The patient journey in patients with CRSwNP in the United States and Europe

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Background: Although timely diagnosis may prevent further chronic rhinosinusitis with nasal polyps (CRSwNP) disease development, delayed diagnosis or misdiagnosis is common. This analysis quantified the CRSwNP patient journey from onset to diagnosis. **Methods:** This cross-sectional point-in-time study of adults with moderate-to-severe CRSwNP in the USA and Europe (EU5: France, Germany, Italy, Spain, UK) used patient- and physician-reported survey data collected from 2018–2019 from the Adelphi CRSwNP Disease-Specific Programme (DSP™). Association between self-rated health (measured by European quality of life 5-dimension visual analog scores [EQ-5D VAS]) and time since diagnosis was assessed using regression analysis. **Results:** 1071 patients were included (USA=251, EU5=820); 378 (USA=56, EU5=322) responded to all patient-reported journey questions. Many patients received an alternative diagnosis before a CRSwNP diagnosis (USA: 41%[23/56], EU5: 36%[117/322]). Patient-reported journey from first symptoms to CRSwNP diagnosis was 1.5 and 2.1 years in the USA and EU5, respectively. Longer periods since diagnosis (>1 year) were associated with lower EQ-5D VAS (P=0.017). **Conclusions:** Patients had substantial delays between symptom onset and CRSwNP diagnosis. Longer time since diagnosis was associated with worse self-rated health, highlighting a gap in timely CRSwNP diagnosis. **Funding:** GSK(ID:208086/213369) Abstract previously presented at ATS 2022: Am J Respir Crit Care Med 2022;205:A3992.



1614

Clinicopathological features of invasive type of fungal infection in sinonasal cavity and the influence of patient's innate and adaptive immunity system

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CRS – diagnosis and investigations 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

Invasive aspergillosis in paranasal sinuses is not a common disease, in comparison with non-invasive type aspergillosis in paranasal sinuses. This disease entity usually coincides with the immunocompromised hosts such as immunodeficiency patients, the aged patients, and patients with diabetes mellitus. Clinical outcome of these patients is not satisfactory. The prognosis varies in each case, depending on effects of multidisciplinary treatments such as medication of anti-fungal agents and/or surgical intervention. We have experienced more than 10 different cases of paranasal sinus *Aspergillus* or *Mucor* invading to the orbit and skull base. Based on our clinical experience, the following conclusion can be addressed. In order to improve its prognosis, an earliest diagnosis should be confirmed by CT scan and MRI, and a multidisciplinary treatment should be planned and performed with a systemic administration of anti-fungal agents. Serum level of beta-D-glucan seemed to be very useful indicator for a diagnosis of invasive type of *Aspergillus* infection and monitoring the disease activity in clinical courses. In our presentation, clinicopathological feature of this disease entity and clinical course are introduced in detail, based on host innate and adaptive immunity system against fungal infection.

CRS – medical management 3

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Maxitrol® as an antibiofilm agent against *Staphylococcus aureus* and *Pseudomonas aeruginosa*

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CRS – medical management 3 | Room 9 Olympic Hall - Level 0 | Tuesday 20/06/2023

Background:Maxitrol® (Novartis) contains antimicrobials and a corticosteroid. If it possesses antibiofilm activity, it may be useful for treating chronic rhinosinusitis (CRS). We investigated the in vitro efficacy of Maxitrol against *Staphylococcus aureus* and *Pseudomonas aeruginosa* biofilms.**Methods:**Minimum biofilm eradication concentration assays were performed for *P. aeruginosa* ATCC 27853 and *S. aureus* ATCC 6538 type strains at 30 minutes, 1 hour or 6 hours. Isolates of both species were collected from the middle meati of patients with cystic fibrosis. Biofilms of clinical isolates were grown and treated in vitro for 6 hours with Maxitrol, both undiluted and at MBEC, then cultured to identify bacterial survival. **Results:**Neither type strain was eradicated at 30 min, nor *S. aureus* at 1 hour at any tested concentration. *P. aeruginosa* was eradicated by a median of 90% and 5.6% Maxitrol at 1 hour and 6 hours, respectively, and *S. aureus* with 90% Maxitrol at 6 hours. Undiluted Maxitrol reliably eradicated all clinical isolates of *P. aeruginosa* but only one of five *S. aureus* isolates.**Conclusions:**Maxitrol reliably eradicates *P. aeruginosa* biofilm but not *S. aureus* biofilm in vitro. It may have a therapeutic role against biofilms in which *P. aeruginosa* is the dominant pathogen.

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DUPILUMAB INDUCED BLOOD EOSINOPHILIA IN SEVERE UNCONTROLLED CRSwNP PATIENTS: A REAL-LIFE STUDY.

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Dupilumab induced blood eosinophilia may be observed during the first year of treatment, but few information about it is available in literature. In this real-life study we analyzed blood eosinophilia levels in 74patients with severe uncontrolled CRSwNP in treatment with dupilumab, evaluating its characteristics, trend, correlation with outcomes of response, and dupilumab safety in relation with blood eosinophilia. We identified: patients with hematic eosinophilia increase of at least 50%of baseline values in one of the time controls(GroupA) or not(GroupB). Then we estimated its trend over time: early onset(within 6months) with/without subsequent reduction, late onset(after 6months). The increase was observed from the first month, with a peak at 3months. The difference was still significant at 6 and 9months, decreasing at 1year with values comparable to baseline. We compared all outcomes between two groups and found no statistically significant differences. Furthermore, we focused on patients that developed absolute blood eosinophilia>1500cells/mm3 and on how we managed it. Finally, no difference was observed between patients with or without blood eosinophils>1500cells/mm3. In conclusions, a subgroup of CRSwNP patients may experience blood eosinophilia increase during the first year of dupilumab treatment not influencing the outcomes of response to treatment, correlated with low risk of adverse events.



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Analysis of antibody levels after SARS-CoV-2 vaccination in patients with chronic rhinosinusitis with nasal polyps and concomitant use of biologics therapy.

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Background: Complete basic immunization with an mRNA vaccine (Comirnaty®; BioNTech/Pfizer or Spikevax®; Moderna) protects against severe courses of SARS-CoV-2 infection. The effect of mRNA vaccination under biologic therapy in patients with severe chronic rhinosinusitis with polyps (CRSwNP) is largely unclear. Method: We examined blood samples from n=74 patients with type 2 CRSwNP under biologic therapy and from n=15 healthy patients (control group). Blood samples were collected at scheduled appointments. To characterize vaccination response, antibodies to the receptor binding domain (RBD) of the SARS-CoV-2 spike protein were quantified using a chemiluminescence microparticle immunoassay (SARS-CoV-2 IgG II Quant, Abbott Diagnostics). A questionnaire was used for retrospective questioning regarding the applied vaccine and influence on CRSwNP. The statistical analysis was performed with SPSS Statistic 29. Results: Serological analysis showed lower antibody titers of SARS-CoV-2-anti-S-IgG in the group of CRSwNP under ongoing biologic therapy than in the control group. The results of the functional analysis of the SARS-CoV-2-anti-RBD IgG by neutralization assay are pending at this time. Conclusion: Based on results of single studies, recommendations regarding Covid-19 vaccination in patients with CRSwNP using biologic therapy have been available since 2021. No clinically relevant adverse effect or interaction of biologics with the mRNA vaccines could be demonstrated in our cohort. Despite chronic disease, depending on the risk of exposure, SARS-CoV-2 vaccination is recommended.

1452

Hypereosinophilia during Dupilumab therapy for nasal polyposis: a review after two years of experience

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Rationale: the introduction of biologics for nasal polyposis (CRSwNP) has been a turning point for its management. Dupilumab has proven outstanding results in efficacy and safety; thus, an increase in the absolute eosinophil count is common, and in extreme cases it determines organ damage. **Materials and methods:** we present the HE-focused 2-year update of a prospective study on Dupilumab prescribed for CRSwNP, and a multidisciplinary evaluation of the literature on the topic. **Results:** in the present cohort, asymptomatic HE was confirmed in a significant proportion of cases ($\sim 21\% > 1.5$), and persistence of HE in the second year was frequent ($\sim 16\%$). This represents an original finding, as HE was considered transient in different studies (also for other indications), and only in a few cases it persisted over 1 year; an early increase in eosinophils may predict long-lasting HE. Three possible managements for HE in the literature were analyzed and compared. **Conclusions:** in a subset of patients, a long-lasting HE, although silent, may impact on the therapy continuation. Accurate selection of patients is crucial to reduce the risk of HE. A target for future studies is the identification of markers to differentiate a rare, potentially symptomatic HE from its most common, indolent variant.

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Effective reduction of type-2 inflammatory biomarkers through biologic therapy is not mirrored by outperforming clinical outcome in patients with Aspirin-exacerbated respiratory disease

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Background:Biologics used in Asthma and CRS patients with or without Aspirin-Exacerbated Respiratory Disease (AERD) offer new treatment options, yet there is insufficient knowledge about treatment outcome in AERD cases and possible influence factors.**Methods:**Retrospective cohort study of CRSwNP, Asthma and AERD patients that underwent screening for biologics at University Medical Center Mainz/Charité Berlin. Analyses included subjective and objective criteria and diagnostics with regards to previous therapy, nasal symptoms, quality-of-life, olfactory function, serum biomarkers, endoscopy, lung function at different time points.**Results:**A total of 124 patients were included in this study. AERD was plausible in 31.7% of cases. Baseline burden of symptoms and clinical presentation showed insignificant differences between non-AERD and AERD cohorts before treatment with Dupilumab, Omalizumab or Mepolizumab. Cohorts showed comparable improvements in SNOT questionnaires and visual analogue scales upon biologics therapy after 4m; however, improvement of nasal polyp score and Sniffin'Sticks identification testing were significantly diminished in AERD. In contrast, blood eosinophils could be reduced significantly better in AERD to 312/ μ l (95CI 161-463; $p < 0.02$), compared to non-AERD patients.**Conclusions:**Anti-Type-2 biologics therapy successfully improved disease control in non-AERD and AERD patients. Suppression of key biomarkers was more successful in AERD. Tailoring future biologic therapy approaches for specific subgroups of patients needs better understanding of underlying endotypes



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Our experience in 'One Airway clinic' and novel multi-modality treatments for patients with complex upper airway inflammatory conditions

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CRS – medical management 3 | Room 9 Olympic Hall - Level 0 | Tuesday 20/06/2023

Patients with inflammatory conditions of upper airway like Allergic Rhinitis and Chronic Rhinosinusitis with Nasal Polyps (CRSwNP) are often associated with lower airway disease (asthma) and Aspirin Exacerbated Respiratory Disease. A concept of 'One airway' is now recognized due to similar aetiology, risk factors and pathophysiological processes underlying these conditions. Hence, it is only appropriate to consider these presentations as a continuum rather than as individual problems. This also emphasizes the need for a comprehensive, integrated approach to airway management. Our unit is leading by example in providing a unified approach to these patients by involvement of ENT, Respiratory physicians, and multi-disciplinary team to tackle these complex patients and their often-long-standing intractable issues. Leading on from that, we are also now researching the use of biologic medications in patients with CRSwNP and the up-to-date clinical management using appropriate biomarkers to determine the most appropriate biologics (monoclonal antibodies) targeting IL-4, 5 and 13. We will discuss, with examples of these patients who benefited from both the concepts of 'one airway, one disease' and the outcomes when using combined modality novel treatment options.



1483

Peak nasal inspiratory flow and the impact of dupilumab treatment in patients with severe CRSwNP from the SINUS-24 and SINUS-52 studies

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Background: Lack of nasal airflow is recognized as a high burden of disease for patients with chronic rhinosinusitis with nasal polyps (CRSwNP). This post hoc analysis evaluated the effect of dupilumab on peak nasal inspiratory flow (PNIF) and other outcome measures in patients with CRSwNP and limited baseline PNIF (

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Sustained clinical benefits in patients with chronic rhinosinusitis with nasal polyps 24 weeks post-mepolizumab treatment

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Introduction: SYNAPSE, a Phase III study in patients with severe chronic rhinosinusitis with nasal polyps (CRSwNP), demonstrated significantly reduced disease severity with 52 weeks of 4-weekly mepolizumab 100 mg versus placebo. Here, post-treatment durability of mepolizumab clinical improvements were assessed. **Methods:** Exploratory endpoints evaluated for 24 weeks post-treatment were mean (SD) change from baseline in: total endoscopic NP score (NPS; Week 76) and patient-reported outcomes (PROs: nasal obstruction visual analogue scale [VAS] score [Weeks 73–76], post hoc in patients without surgery during SYNAPSE; 22-item sinonasal outcome test [SNOT-22] total score [Week 76] in the overall follow-up population). **Results:** 134 patients (mepolizumab n=69; placebo n=65) entered follow-up; 26 patients with surgery during the study were excluded. Larger NPS reductions from baseline to Week 52 with mepolizumab versus placebo persisted throughout follow-up (Week 76: -1.4 [-1.7]/-0.5 [1.7]). Larger PRO improvements from baseline with mepolizumab versus placebo were maintained throughout follow-up (nasal obstruction VAS Weeks 73–76: -4.4 [3.2]/-3.9 [3.3]; SNOT-22 Week 76: -28.5 [26.8]/-16.7 [25.8]). **Conclusions:** Post-treatment, patients with severe CRSwNP maintained mepolizumab-induced NP size and symptom improvements, suggesting that targeted IL-5 inhibition offers durable clinical response in CRSwNP. **Funding:** GSK [ID:205687/NCT03085797] Abstract previously presented at ACAAI 2022: Ann Allergy Asthma Immunol 2022;129(5):S71-2.



Technological advances 1

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Reduced intra-subject variability of an automated skin prick test device compared to a manual test

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Technological advances 1 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Background: The skin prick test (SPT) is the gold standard for identifying allergic sensitization in individuals suspected of having an aeroallergy. Previous research has shown considerable variability due to the sequence of steps inherent to a manual SPT. **Objective:** This study aimed at comparing the reproducibility, tolerability, and safety of a newly developed skin prick automated test (SPAT) device compared to the manual SPT (SPMT). **Methods:** The 118 volunteers enrolled in the study underwent both SPAT and SPMT with histamine and glycerol control solutions. Wheal size readouts were performed manually by an experienced clinician and automated by the SPAT device. Discomfort for the participants was assessed using a visual analogue scale. **Results:** Coefficient of variation was significantly lower in the SPAT (median (interquartile range): 13.6% (10.4-17.7%)) compared to the SPMT (17.6% (13.6-22.9%)) group ($p < 0.0001$). Discomfort was scored significantly lower in the SPAT (median (IQR): 2cm (1-2cm)) compared to the SPMT (2cm (1-4cm)) group ($p = 0.0009$). Prick failures were significantly less frequent in the SPAT (N=6) compared to the SPMT group (N=179) ($p < 0.0001$). **Conclusion:** SPAT showed increased reproducibility and tolerability compared to SPMT. SPAT can limit the number of prick failures due to human errors during SPMT.

1303

communication skill in Otolaryngology

ABDULRHMAN ALFAYEZ¹

¹KAMC

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Communication skills in patient safety Dr. ABDULRHMAN ALFAYEZ
 CONSULTANT King Saud Bin Abdulaziz University for Health Sciences
 King Abdulaziz Medical City — Define communication and discuss the standards of effective communication— Describe the importance of communication— Recognize the connection between communication and medical error— Describe strategies for information exchange
 Magnitude of the Problem— Identify barriers, tools, strategies, and outcomes to communication— 1 person get problem every 5-10 minutes due to harmful events in hospitals— 70% of these events is the result of breakdown in communication— Where breakdowns occur:— Between patients and health-care providers— Between health-care providers
 Components of Successful Teamwork— Open communication— Nonpunitive environment— Clear direction— Clear and known roles and tasks for team members— Respectful atmosphere— Shared responsibility for team success— Appropriate balance of member participation for the task at hand— Acknowledgment and processing of conflict— Clear specifications regarding authority and accountability— Clear and known decision making procedures— Regular and routine communication and information sharing— Enabling environment, including access to needed resources— Mechanism to evaluate outcomes and adjust accordingly— understanding where communication can break down and the tools that can be used to establish effective communication
 Communication Challenges: - Common Barriers: - Communication Styles: -- Aggressive— Passive— Assertive
 How to improve communication skills, by (I – S – B – A – R – D)• Identify• Situation• Background• Assessment• Recommendation• Decision
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1609

Mixed-method analysis of FESS skill acquisition by training grade using simulation on PHACON models.

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Background: PHACON models are 3D printed hand assembled models made using DICOM data from CT sinus scans. They are emerging as an alternative to cadaveric models and becoming popularised in view of the option to practice on simulated pathology. Methods: ENT trainees in the East of England were provided with a 1-day FESS simulation training session using PHACON models. Intercollegiate Surgical Curriculum Programme (ISCP) levels were self-assessed before and after the simulation, and compared using Wilcoxon signed ranks tests. Thematic analysis was conducted on reflective data on learning goals before, during, and after simulation using NVIVO software. Results: Before the simulation themes included: practicing surgical techniques, confidence with anatomy, familiarity of instruments and experience. ISCP levels significantly improved for core trainees ($p=0.03$) and ST3-5 trainees (0.008) but not ST6+ trainees (0.083). Themes for more junior CT1-5 trainees included visibility, access and technique. Senior trainees ST6+ themes included variable anatomy, real cases, and use of angled instruments. Conclusions: Simulation using PHACON for FESS procedures is an effective method of improving self-assessed FESS skills, particularly for CT1-ST5 level trainees. Learning themes post-simulation may inform further training. Future studies may benefit from stratifying trainee groups using variable anatomy and increasing complexity of techniques.

1618

Use of a Novel Interactive Video Tool in Assessing UK Junior Doctors' Knowledge of Nasendoscopic Anatomy

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Technological advances 1 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Background Junior doctors in ENT are expected to use flexible nasal endoscopy (FNE) routinely, even independently, during out-of-hours cover. However, their knowledge of nasendoscopic anatomy is not well understood. This study aimed to evaluate the efficacy of a novel interactive video tool in assessing their knowledge. **Methods** Junior doctors in four UK hospitals were sent an interactive FNE video with 25 anatomy identification and 3 procedural questions, tailor made using H5P software. A questionnaire was also administered to collect trainee demographics, previous ENT exposure, and confidence in identifying FNE anatomy. **Results** The study received 22 responses from doctors at various levels of training. The average score for the FNE video was 58.6%. CSTs scored significantly higher (91.5%) than GP trainees (33.9%), FY2s (59.1%), and non-training post-FY2 doctors (53.3%) (one-way ANOVA $p=0.004$). Confidence was moderately correlated with performance (Person's Coefficient 0.49), but the number of FNEs performed was not significantly correlated with score (Spearman's rank correlation test $\rho = 0.479$, $p = 0.083$). **Conclusions** As well as highlighting a knowledge, and potentially insight, gap in junior doctors' FNE anatomy, the interactive video tool provides a promising approach to identify knowledge gaps and tailor training to individual needs. Further studies using this tool are needed to determine its effectiveness in improving trainees' performance in clinical practice as well as broader application to endoscopic sinus surgery.



1171

Identifying chronic rhinosinusitis without nasal polyps by analyzing aspirated nasal air with an electronic nose based on differential mobility spectrometry

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Background

The diagnosis of chronic rhinosinusitis (CRS) is a complicated procedure. An electronic nose is a novel method that detects disease from gas-phase mixtures, such as human breath.

Aims/Objectives

To determine whether an electronic nose based on differential mobility spectrometry (DMS) can detect chronic rhinosinusitis without nasal polyps (CRSsNP) by analyzing aspirated nasal air.

Materials and Methods

Adult patients with CRSsNP were examined. The control group consisted of patients with septal deviation. Nasal air was aspirated into a collection bag and analyzed with DMS. The DMS data were classified using regularized linear discriminant analysis models with 10-fold cross-validation.

Results

The accuracy of the DMS to distinguish CRSsNP from patients with septal deviation was 69%. Sensitivity and specificity were 67% and 70%, respectively. Bonferroni-corrected statistical differences were clearly noted. When a subgroup with more severe inflammatory disease was compared to controls, the classification accuracy increased to 82%.

Conclusion

The results of this feasibility study demonstrate that CRSsNP can potentially be differentiated distinguished from patients with similar nasal symptoms by analyzing the aspirated nasal air using DMS. Further research is warranted to evaluate the ability of this novel method in the differential diagnostics of CRS.

1214

Objective assessment of significant effects of endonasal inflammation on the nasal cycle

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Technological advances 1 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Longterm rhinoflowmetry gives a prolonged insight into endonasal pathophysiology, but up to date lacks a clear rhinologic indication. Our hypothesis was affaction of the nasal cycle caused by endonasal chronic inflammation such as chronic rhinosinusitis or allergic rhinitis. Methods: 113 subjects (72 ♀, 41 ♂; 81 patients and 34 healthy controls mean 34,8 years of age) were evaluated using a standardised rhinologic assessment including nasendoscopy, olfactory testing, rhinomanometry/rhinoresistometry, acoustic rhinometry and long-term rhinoflowmetry in a prospective manner. Long-term rhinologic measurements were objectively assessed for technical issues and artefacts. Suitable measurements were assessed by three different, blinded investigators and in several technical settings to determine optimal visualisation and calculation employing intra-class correlation coefficient of 6 different items. Results: Technical visualisation of the optimal calculation mode was determined with a mean ICC of 0.88 suggesting very high reliability. 12 subjects had to be excluded for technical reasons (8,4%). Nasal breathing volume varied between 0,75 to 19,7 l/min. Endonasal inflammation resulted in significantly smaller MCA2 ($p < 0.001$) and significantly lower nasal respiratory volume if measured during night time ($p < 0.0001$) among more significant group differences. Discussion: Long-term rhinoflowmetry is able to explain sleep disturbances in patients with chronic endonasal inflammation and can be used for objective quantification of nasal cycle pathophysiology.



Epistaxis and HHT + Facial Trauma

1472

NASAL SEPTUM PERFORATION CONSERVATIVE TREATMENT IN SYSTEMIC JUVENILE IDIOPATHIC ARTHRITIS PATIENTS

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Epistaxis and HHT + Facial Trauma | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Objectives/Hypothesis: Most of perforation symptoms and clinical manifestations can be reduced with conservative treatments, thus improving the patient's quality of life. **Methods:** 10 adult patients and 18 children received treatment by nasal septum silicone prosthesis. The mean age - 23 ± 17 years, of which 15 (54%) were men and 13 were women (46%). We assessed patient tolerance of this method using a modified Russian version of the above-mentioned questionnaire (Nasal Button Outcome Questionnaire). **Results:** The total score in patients before splinting was 6.5 ± 2.3 points out of the maximum possible 36 points, after 3 months of splinting, the total score was 2.4 ± 2.5 ($p=0.232$). **Conclusions:** The method allows to reduce the frequency of nosebleeds, difficulty in nasal breathing, the crusts formation, whistling during breathing. Increase in the epithelialization of the edges of the perforation contributes to a slower increase in its size and a better prognosis with subsequent plastic closure.



1589

Surgical management of patients with refractory epistaxis: A single-center experience

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Epistaxis and HHT + Facial Trauma | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Objective: Our aim was to present our center's experience in treating patients with severe relapsing epistaxis who had previously undergone conservative procedures and evaluate their outcomes. **Methods:** Single-center retrospective review of the medical records of patients hospitalized due to epistaxis and submitted to surgery and/or embolization from January 2017 to December 2022. **Results:** A total of 36 patients were identified. Mean age was 62,7±17,1 years and 66,7% (n=24) were male. 69,4% (n=25) were hypertense, 33,3% (n=12) anti-aggregated, and 16,6% (n=6) had platelet dysfunction. 25 patients (70%) were submitted to endoscopic ligation and/or electrocauterization of the sphenopalatine artery (SPA) and 3 to arterial embolization. Revision surgery or nasal packing was necessary in 16%. Hypertension was associated with revision (p=0,04). There was no relationship between revision and age > years (p=0,66), antiaggregant use (p=0,61), atrial fibrillation (p=0,45) or diabetes (p=0,16). Hospital stay was significantly lower in patients who underwent surgery within the first 24 hours of admission compared to those submitted more than 24 hours after hospitalization (4,5±2,7 vs 8,1±4,4 days, p<0,01). No complications of SPA ligation were registered. 1 patient had venous thrombosis after the embolization procedure. **Conclusion:** As demonstrated in our study, SPA ligation is an effective and safe management strategy for surgical control of refractory epistaxis. Early timing of surgery may lead to a reduction in length of stay.



1728

Septal splints for recurrent epistaxis in Hereditary hemorrhagic telangiectasia patients

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Epistaxis and HHT + Facial Trauma | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Objective: To report our experience in the use of silicone septal splint for recurrent severe epistaxis in Hereditary haemorrhagic telangiectasia patients (HHT). **Methods:** This is a descriptive analysis carried out at the Otorhinolaryngology Department of Fondazione IRCCS Policlinico San Matteo in Pavia, a reference centre for the treatment and diagnosis of HHT. We retrospectively evaluated HHT patients who underwent silicone septal splint positioning after the endoscopic surgical treatment of epistaxis from 2000 to 2022. **Results:** Of the 506 patients surgically treated in the period of analysis, 74 patients underwent silicone septal splint positioning and 37 were postoperatively interviewed. With a mean of 2.4 previous surgical treatment and a mean epistaxis severity of 7.38, the majority of patients presented with septal perforation (71.6%). On average, patients maintained the splint in place for 54.5 months, with a good tolerability and a significant reduction in epistaxis severity, need for blood transfusion and improvement of haemoglobin levels. **Conclusions:** In HHT patients with recurrent severe epistaxis and with septal perforation, the placement of septal splints offers a useful additional strategy in the management of nosebleeds.

1740

Investigating the effects of Midvault Repair Techniques on the likelihood of epistaxis from intranasal sprays

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Epistaxis and HHT + Facial Trauma | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Background: The use of topical intranasal steroid sprays is known to cause epistaxis when an increasing amount of drug medications deposit at the nasal septal wall, even in cases when patients follow manufacture's' recommendations to aim spray laterally towards the nasal lateral wall. This study uses computational modeling to compare the drug quantity depositing at the septum before and after midvault reconstruction with spreader graft (SG) or spreader flap (SF). **Methodology/Principal:** SG and SF were performed sequentially on two cadaveric head specimens. Computational fluid dynamics modeling was used to simulate airflow and intranasal spray drug delivery in each specimen's nasal airway reconstructed models (Pre, SF and SG) at resting inspiratory airflow rate of 15 L/min. Drug delivery was simulated to mimic instructions for use of most topical intranasal sprays from manufacturers' package inserts. Anterior (AS) and posterior (PS) septal wall drug depositions were quantified for Pre, SF, and SG. **Results:** Depositions in Specimen 1 were: Pre - left AS=72%; left PS=10%. SF - left AS=47%; left PS=23%. SG - left AS=37%; left PS=29%. Specimen 2 depositions were: Pre - left AS=80%; left PS=3%. SF - left AS=53%; left PS=29%. SG - left AS=85%; left PS<1%. Approximately zero deposition was recorded on the right septum for Pre, SF and SG in both specimens. **Conclusion:** In general, preliminary results suggest that SF reduces septal wall drug deposition anteriorly but not posteriorly, which was also true for SG in specimen 1 but not specimen 2.



1772

3-D matrix Purabond® use to achieve haemostasis in Awake surgery.

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Epistaxis and HHT + Facial Trauma | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Introduction Haemostasis is one of the ultimate goals of surgery. Recently there has been a rising trend of awake surgery. Awake surgeries also known as office-based surgeries are procedures done under local anaesthesia. Bleeding especially during local anaesthesia procedures can be stressful. In many cases the sight of blood can cause anxiety to the patients which in turn can lead to physiological changes like tachycardia, increase in blood pressure and which can increase bleeding. Post operative nasal packing can cause discomfort and increase recovery time. Purabond® has a synthetic peptide which forms crosslink 3D matrix when in contact with blood. Method: We used Purabond® in patients who underwent awake Rhinology surgery in NHS trust. Results: 100% patients had a good haemostasis control. None of the patients had any post operative bleed. Conclusion: Purabond® 3D matrix achieves good haemostasis without causing any discomfort to the patient.



1151

Forehead flap as reliable method for functional and aesthetic nasal reconstruction

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Epistaxis and HHT + Facial Trauma | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Rising incidence of nasal & fascial trauma is an increasing concern in Ukraine. Paramedian forehead flap is reliable workhorse for reconstruction of nasal defects. However, incessant processes of surgical improvement require the use of new approaches, which allow patients to receive more effective result. The purpose of this study is to demonstrate the implementation of the forehead flap for nasal reconstruction to address a partial or complete rhinectomy after traumatic cases, burns and oncological treatment. This work demonstrate process of preoperative assessment and planning, further intraoperative procedure and postoperative patients follow up. Through precise analysis of the defect, planning and correct execution of surgery, large nasal defects can be restored, with excellent functional and aesthetic results. With careful attention to the reconstruction of all nasal subunits, skin matching, paramedian forehead flap can restore virtually any large nasal defect. Our cases will demonstrate the range of techniques that can be used for variety of nasal defects



1631

Video Clinics for Nasal bone Injuries in COVID times – Is it a valid tool for Routine Practice

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Epistaxis and HHT + Facial Trauma | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Aims of the study To compile and compare the results of virtual clinics for nasal bone injuries conducted during peak covid times, and face-to-face clinic appointments. **Methodology** The pre-existing three-month data for video clinics was available & we collected similar data for face-to-face clinics lasting six months. The data was collected for the total number of patients by age group, the sex, failure to attend and, the numbers requiring nasal manipulations. The data were analysed using the Chi-Square test in Scify Python 3.0. **Results** No difference was observed when comparing patients under & over 18 age groups (p-value – 0.961), DNA at follow-up clinic (p-value – 0.0734) and the numbers requiring fracture reduction (p-value – 0.0734 with 2 degrees of freedom). **Conclusions** The Video clinics are seen equally effective in managing patients with suspected fracture nasal bones. Their use can build into routine clinical practice & they may not be limited to emergency times as contemplated before. The authors recommend a balanced approach to the use of video clinics as it costs an additional appointment.

Sinonasal malignancy 1

1143

Adenoid cystic carcinoma of maxillary sinus: A report case

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Sinonasal malignancy 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

Introduction: Adenoid cystic carcinoma is a malignant neoplasm that usually settles in the exocrine glands, especially the salivary glands. Other less frequent locations (5%) are the oropharynx and nasopharynx. More frequent between the 5th and 6th decade of life and in women. They are usually asymptomatic or present with non-specific inflammatory symptoms such as unilateral nasal respiratory failure, rhinorrhea...**Material and methods:** We present the case of a 63-years male patient with diabetes and benign prostatic hypertrophy, under follow-up by otolaryngology due to left nasal respiratory failure that did not improve despite medical treatment. Subsequently, she developed a stony consistency tumor in the left malar region that had been increasing and nasofibroscopy revealed septal dysmorphia in the left nostril and mass effect of the maxillary sinus tumor. CT of paranasal sinuses and echo-trucut of the lesion are requested.**Results:** The CT shows a large tumor with aggressive radiological behavior, located in the region of the left maxillary sinus that invaded the nostril and infiltrated the base of the skull, chewing space, orbits and cheek. The biopsy revealed the result of adenoid cystic carcinoma of the left maxillary sinus.the patient was taken to a Tumor Committee where the treatment with concurrent radiotherapy and chemotherapy was completed.**Conclusion:** The adenoid cystic carcinoma of the maxillary sinus is an aggressive tumor with a tendency to invade and infiltrate neighboristructures. Diagnosis and treatment are often delayed because it presents asymptotically.



1267

Primary Extracranial Meningiomas of the Sinonasal tract

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Sinonasal malignancy 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

Primary extracranial meningiomas of the sinonasal tract (PEMS) with no intracranial extension are rare tumors of the head and neck. Our study presents the largest systematic review to date, along with an emblematic case report. We aim to provide a comprehensive overview of the clinical characteristics and prognosis of PEMS. A systematic review was conducted according to PRISMA guidelines on PubMed, Embase, and Google Scholar up to 1st November, 2022. A total of 70 documented cases from 64 articles were included. Majority of patients were symptomatic (97%) with nasal symptoms (72%); though eye symptoms (41%) and facial swellings (41%) were not uncommon. The maxillary sinus was the most commonly affected anatomical site. PEMS have a predilection for invasion, nearly half of the cases reported erosion of sinonasal walls and orbital involvement. Most tumors are WHO Grade 1 of meningothelial type, EMA and vimentin positive. PEMS have a favourable prognosis, with a high survival rate and a low rate of recurrence, despite the predilection for invasion. There are no clear defining clinical features of PEMS, hence it is imperative for clinicians to have a high level of suspicion and prioritise histological diagnosis with immunohistochemical testing to guide further management. Surgical resection remains the mainstay of treatment



1271

Facial skull reconstruction with patient-specific 3-D printed titanium implants

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Sinonasal malignancy 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

The anatomy of the craniofacial region is complex, with critical functional and aesthetic importance. The consequences of facial bone damage caused by sino-nasal malignancies, various maxillo-facial surgeries, traumas, inflammations and congenital anomalies dramatically impact the quality of life. However, current surgical options to reconstruct advanced facial bone defects have limitations in achieving good facial cosmetics and restoring impaired chewing, swallowing, speaking and breathing, highlighting the importance of developing new surgical solutions. The author presents a series of six cases in which the extensively missing facial bones were reconstructed entirely with a patient-specific 3D-printed titanium implant. Computer tomographic images of the head processed with computer-assisted design (CAD) software aided the medical team in designing the ideal implant with reverse engineering to replace specific bony defects. The operating surgeon carefully planned and performed the facial implantation on the model head with the prototype printed in 3D from cheap resin. The ready-designed implant was printed from grade 23 titanium powder with laser metal fusion technology. In most cases, the surgeon used the mid-facial degloving approach for positioning and fixing the implant. As a result, the surgeries were complication-free, and the complex 3D-printed custom-fit titanium implant successfully improved the previous structural, aesthetic and functional deficits. In addition, oral health-related questionnaires, pre-and postoperative photographs and clinical tests documented the surgical details and the cosmetic and functional results.



1283

A plan to reduce morbidity and mortality in a high incidence area of sinonasal adenocarcinoma

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Sinonasal malignancy 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

Background: Sinonasal intestinal type adenocarcinoma (ITAC) is rare and accounts for a minority of all sinonasal carcinomas. Among woodworkers, however, the incidence of sinonasal ITAC is believed to be around 1000 times higher. The purpose of this study is to create a protocol of intervention in an area of 550.000 habitants with a high number of occupationally exposed professionals to wood dust. Methods: Retrospective cohort study of all the patients diagnosed with sinonasal ITAC in the otorhinolaryngology department of a Portuguese tertiary level hospital between January 2018 and December 2022. Results: We diagnosed 28 cases of sinonasal ITAC in the last 5 years, 12 of which (43%) presented in an advanced stage (T3 or T4). History of occupational exposure to wood dust was established in 26 patients (93%). Conclusion: According to the literature, sinonasal ITAC has a global annual incidence of around 0.13/100.000. Thus, our hospital would be expected to diagnose less than 1 case per year. With that in mind, a collaborative work is taking place between the otorhinolaryngology and public health departments to create a plan of primary intervention in wood companies and rapid referral to otorhinolaryngology in case of suspected signs and symptoms of sinonasal malignancy.

1298

Maxillectomy – Otorhinolaryngology Department Expertise and Review of Surgical Nomenclature

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Sinonasal malignancy 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

Introduction and Objectives: Open maxillectomy is still the treatment of choice in malignant and recurrence benign tumors. The complex anatomy and the lack of consensus in classification systems reflects the variety of adjectives to the extent of the operation. Accurate description is necessary to appropriate rehabilitation, reconstruction and comparison. We propose to present the experience of the department and to analyze and uniform the different maxillectomies. **Material and Methods:** We have reviewed 43 maxillectomies between 2017-2022, its extent, approach and adjacent structures removal. Spiro classification and relevant literature about the topic was reviewed. **Results:** Histologic diagnosis was squamous carcinoma in 28%, followed by salivary gland carcinoma (25%) and sarcoma (12%). The maxillectomy performed in 30% was a limited maxillectomy - which primarily removed one wall of the antrum. Medial wall was removed in 61% and vestibular approach used in 54%. Sub-total maxillectomy was performed (28%) when was removed at least two walls, including the palate, but not the posterior wall. Access was provided by Weber-Ferguson (WF) incision in 92%. Total maxillectomy was performed in 18, 12 with WF incision and subciliar extension and 5 with orbital exenteration. **Conclusion:** As well as histopathologic specificity in sinonasal tumors grows, so does the complexity of the surgical and reconstructive procedures. Despite Spiro classification is not guided for the reconstruction of the defect, it is quite informative and easy to uniform the surgical procedure nature.



1327

Unilateral Nasal Polyp: Predictors for Malignancy

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Sinonasal malignancy 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

Objective: To identify factors suggestive of malignancy in patients presenting with a unilateral nasal polyp (UNP). **Methods:** The medical records of 235 patients (>18y) who underwent endoscopic-guided biopsy for UNPs between 2007-2020 were reviewed. Patients were divided into "benign" and "malignancy" groups based upon the histopathology results. Statistical analyses identified factors predictive for malignancy. **Results:** Twenty-seven patients (11%) were included in the "malignancy" group and 208 (89%) in the "benign" group (60% with inflammatory disease and 29% with benign neoplasm). Factors associated with malignancy included clinical presentation of epistaxis (32% vs 11%, $p=0.01$) and extranasal manifestations (24% vs 4%, $p<0.001$), suspicious appearance (e.g., friable, irregular mass) (42% vs 4%, $p<0.001$) and non-middle meatus location on endoscopy (82% vs 36%, $p<0.001$), and suspicious radiological findings (e.g., bone erosion, invasion to adjacent structures) (65% vs 5%, $p<0.001$). **Conclusion:** Clinicians should have a high index of suspicion to rule out malignancy in patients with UNPs, especially in patients who present with epistaxis or extranasal symptoms, when the polyp has suspicious endoscopic or radiologic appearance, and is located outside of the middle meatus.



1353

Inverted Sinonasal and Middle Ear Papilloma with evidence of Squamous Cell Carcinoma. A case reports

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Sinonasal malignancy 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

Abstract Sinonasal schneiderian papilloma is a benign neoplastic proliferation that originates from epithelial cells that typically affects the nasal cavity. These tumors have been reported to be locally aggressive with a high tendency of malignant transformation and recurrence particularly if incompletely resected. The occurrence of IP in the middle ear or mastoid process is a rare entity. Case Presentation. A 52-year-old female patient, operated on nasal inverted papilloma in 2007 and 2008. In 2020 presents history of nasal obstruction on the left side undergoing inverted papilloma with dysplasia in the lateral wall of the left maxillary sinus. In May 2022 recurrence of inverted papilloma in the tail of the left middle turbinate and occupation of the left middle ear. Pathological anatomy reports of carcinoma in inverted Sino nasal Papilloma and middle ear. The patient underwent subtotal petrosectomy October 2022 and is now undergoing radiotherapy treatment. Conclusions. This abstract describes a rare case of inverted papilloma of the Sino nasal cavity with middle ear involvement. Investigations revealed malignant transformation and positive HPV association. Reported cases of middle ear papilloma reveal higher recurrence rates and malignancy potential compared to those confined to the Sino nasal cavity. Accordingly, an aggressive approach to the management of similar lesions is recommended along with strict close follow up using nasal endoscopy,



1455

Multiphenotypic sinonasal carcinoma: an interesting new entity

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Sinonasal malignancy 1 | Room 7 Hall 10 - Level 8 | Tuesday 20/06/2023

HPV-related multiphenotypic sinonasal carcinoma (HMSC) is a recently described sinonasal neoplasm morphologically like adenoid cystic carcinoma (ACC), characterized by a salivary gland tumor-like appearance with myoepithelial and ductal cells, surface squamous dysplasia, and indolent behavior. Differential diagnosis of HMSC includes basal cell adenocarcinoma and ACC, both aggressive high-grade salivary gland carcinomas. These tumors are defined by HPV infection in the absence of MYB, MYBL1, or NFIB fusion genes. High-risk HPV genotypes infection such as type 33, the most common, but also types 35, 52, and 56, strongly support the diagnosis. Immunohistochemical analysis, ibridation in situ (ISH) and polymerase chain reaction (PCR) are fundamental and essential for an accurate differential diagnosis; therefore, the full morphologic and immunophenotypic profile of HMSC continues to be unrevealed. Expressions of p16, SOX10 and LEF-1 are typical in these tumors; conversely, MYB protein presents a variable expression. Currently, ISH and PCR are the best ways to diagnose HMSC, but further studies will be needed to standardize the diagnostic modalities of this sinonasal tumor and to use innovative biological treatments.



CRS – medical management 2

1356

Nasodine is an effective antibiofilm agent with the potential for treating chronic rhinosinusitis

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CRS – medical management 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

Background:Staphylococcus aureus biofilms in the paranasal sinuses are associated with more severe and recalcitrant chronic rhinosinusitis (CRS). Few suitable antibiofilm agents are available to treat this problem. Nasodine® Nasal Spray (Nasodine) is a 0.5% povidone-iodine based formulation, developed specifically for sinonasal application. We investigated the antibiofilm efficacy of Nasodine to determine whether it may have potential as a treatment for CRS-associated biofilms. **Methods:**Biofilms of *S. aureus* ATCC 6538 were grown in vitro using the Centers for Disease Control biofilm reactor. Intact biofilms were treated by immersion in 0.9% saline (control), half concentration Nasodine, or full concentration Nasodine for between 5 minutes and 6 hours. Further biofilm cells were dispersed into suspension then treated for between 30 seconds and 5 minutes. Surviving bacteria were enumerated by culture and counting colonies. **Results:**Nasodine demonstrated time and concentration dependent bacterial killing against intact biofilm. Statistically significant reductions in viable bacteria from intact biofilms were seen with exposures as brief as 5 minutes. Nasodine consistently eradicated dispersed biofilm within 1 minute. **Conclusion:**Nasodine is highly active against biofilms of *S. aureus* ATCC 6538 in vitro. The intact biofilm structure led to increased kill time despite bacteria remaining susceptible to Nasodine.



1357

A modified formulation of Zoono® has enhanced efficacy against bacterial biofilms

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CRS – medical management 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

Background: Sinonasal bacterial biofilms are associated with greater severity and recalcitrance of chronic rhinosinusitis (CRS). Few effective topical products are available for their management. Zoono® is a quaternary ammonium compound-based hand sanitiser. Zoono B22-1402A is a modified formulation of this product. If effective against biofilms, they may hold promise for managing biofilms in CRS. **Methods:** Biofilms of *Staphylococcus aureus* and *Pseudomonas aeruginosa* were grown using the Centers for Disease Control (CDC) biofilm reactor and the Calgary Biofilm Device (CBD) then immersed in Zoono®, Zoono® B22-1402A, or 0.9% saline control for up to 24 hours. Viable bacteria remaining after treatment were cultured and enumerated by colony counting. **Results:** Time and concentration dependent killing was observed with both formulations against both species. For biofilms grown in the CDC biofilm reactor, Zoono® B22-1402A eradicated biofilms of both species at 6 hours, though complete eradication was not achieved with the original Zoono® formulation. In the CBD, biofilm killing occurred more rapidly leading to eradication within 6 hours with both formulations against both species. **Conclusions:** Both Zoono® formulations exhibited antibiofilm activity, with Zoono® B22-1402A demonstrating greater potency. In vitro toxicity studies progressing to human trials are warranted.

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Investigating Best Drug Delivery Characteristics After Functional Endoscopic Sinus Surgery

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CRS – medical management 2 | Room 8 Hall 4 - Level 0 | Tuesday 20/06/2023

Introduction: Topical medications are typically prescribed after functional endoscopic sinus surgery (FESS) for patients with chronic rhinosinusitis (CRS) to improve healing and reduce recurrence rate. This study compares sinus drug depositions between manufacturer's current-use instruction (CUI) and best-case scenario (BCS) in a post-FESS sinonasal airway using computation fluid dynamics modeling. **Methods:** Post-FESS computed tomography images of an adult male patient with bilateral CRS were used to create a patient-specific sinonasal airway model. Drug particles (1-100µm) transport simulations were performed at resting inspiration (15 L/min) from 5 release locations (Bottom, Center, Top, Lateral, and Medial) and in 5 head positions (Mygind, Supine, Tilted-Back, Tilted-Forward, and Upright) to compare CUI (head Tilted-Forward and Lateral release location) versus BCS. Depositions were calculated for all sinuses– frontal (FS), maxillary (MS), ethmoid (ES), sphenoid (SS), and the ostiomeatal complex (OMC). **Results:** CUI depositions– Left: ES=0.16%, MS=0.42%, OMC=0.06%, FS=SS=0%; Right: MS=0.01%, ES=FS=SS=OMC=0%. BCS depositions– Left: ES=0.51%, FS=0.04%, MS=0.42%, SS=0.01%, OMC=2.64%; Right: ES=0.28%, FS=0%, MS=2.13%, SS=0.22%, OMC=4.48%. The Mygind head position and Top release location demonstrated superior performance for depositions under BCS. **Conclusion:** Preliminary findings suggest that intranasal spray administration to target delivery of drugs into the paranasal sinuses and OMC may not provide maximum benefit under manufacturer's current recommended instructions.



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Characteristics of Patients with Chronic Rhinosinusitis with Nasal Polyps (CRSwNP) Initiating Dupilumab in Real-world Clinical Practice in the US

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Background: This real-world evidence study describes characteristics of patients with CRSwNP treated with dupilumab in the US. **Methods:** A retrospective observational cohort of adults with CRSwNP initiating dupilumab 300 mg was identified from June 2019 to June 2021 using claims and electronic medical records data from the OM1 Real World Data Cloud (OM1, Inc, Boston, MA, US) and Reg-ENTSM registry (AAO-HNS/F, Alexandria, VA, US). Demographics and comorbidities, medications, sinus procedures, and sinus-related imaging during the 12 months prior to dupilumab initiation were summarized descriptively. **Results:** A total of 1,016 dupilumab initiators were identified. Patients had a mean (SD) age of 53.8 (14.1) years (60% were 40–64 years), 54% were male, 79% Caucasian, 14% African American, 3% Asian, and 90% non-Hispanic/non-Latino. The most common type 2 inflammatory comorbidities were allergic rhinitis (71%) and asthma (57%). Other comorbidities included diabetes (9%) and chronic obstructive pulmonary disease (8%). Prior to initiating dupilumab, 74% of patients received systemic corticosteroids, 65% antibiotics, 71% nasal endoscopy, 22% CT scan, 16% endoscopy and CT scan, and no patient received an MRI scan. **Conclusions:** This real-world population of adult CRSwNP patients initiating dupilumab had a high therapeutic burden including systemic treatments and diagnostic procedures, and a high burden of comorbidities.



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Can we repurpose Simvastatin to treat recalcitrant *S. aureus*-mediated chronic rhinosinusitis?

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Background: Epithelial *S. aureus* colonisation with intracellular localisation is associated with chronic rhinosinusitis (CRS) disease resistance and an increased number of revision sinus surgeries. Our data shows Simvastatin is effective in reducing intracellular *S. aureus* burden in mast cells and reduces the associated inflammatory response. We tested the effects of Simvastatin treatment on both infected and Staphylococcal enterotoxin B (SEB)-exposed nasal epithelial cells. **Methodology:** Air-Liquid Interface (ALI) cultured primary nasal epithelial cells were harvested from CRS patients. The apical surface was exposed to *S. aureus* and SEB treatment in the presence and absence of Simvastatin. Trans-epithelial electrical resistance (TEER) and pro-inflammatory cytokine release were measured. **Results:** Simvastatin treatment reduced the TEER when ALI apical surface was exposed to SEB, but appeared to have no significant effect on live *S. aureus*. Simvastatin treatment appeared to reduce pro-inflammatory cytokine expression from baseline significantly reducing IL6 production (0.56-fold, $P < 0.05$) and reducing TSLP (0.46-fold), TNF α (0.46-fold), CXCL8 (0.53-fold) and IL33 (0.64-fold) which was tending towards significance. Light microscopy demonstrated a reduction in *S. aureus* burden on simvastatin-treated ALI cells. **Conclusions:** Simvastatin has the potential to be repurposed to target intracellular *S. aureus* in resistant CRS disease and may reduce the associated pro-inflammatory response.



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Two-year results of tapered dupilumab for CRSwNP demonstrates enduring efficacy established within half year

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Background: dupilumab is an anti-T2-inflammatory biological registered for CRSwNP, indicated by integrated CRS-care pathways when optimal medico-surgical treatment yields insufficient CRS-control. This study aims to evaluate long-term results with focus on therapeutic efficacy established while tapering. Methods: real-life, prospective observational cohort study in single tertiary referral center with add-on dupilumab as primary biological treatment in adult (≥ 18 y) biological-naïve CRSwNP-patients per EPOS2020-indication with a 2-year follow-up. Tapering (increasing interdose-interval) applied every 24 weeks, conditional to sufficient treatment response and CRS-control. Results: mean scores (s.d.) of all co-primary outcomes improved significantly from baseline (N=228) to the 48- (N=214) and 96-weeks (N=99) timepoints: NPS improved from 5,3 (1,9) to 1,4 (1,8) and 1,3 (1,7); SNOT-22 improved from 53,6 (19,6) to 20,2 (15,4) and 21,2 (15,6); Sniffin' Sticks-12 improved from 3,7 (2,4) to 7,7 (2,9) and 7,3 (3,04); ACT improved from 18,5 (4,8) to 21,8 (3,8) and 21,4 (3,9). One-way repeated-measures ANOVA demonstrated no significant alterations of individual co-primary outcome mean-scores from 24-weeks onward. Conclusion: this first long-term real-life prospective observational cohort study shows high therapeutic efficacy of dupilumab for severe CRSwNP in the first two years. Therapeutic efficacy is principally established within 24 weeks, and endures while tapering dupilumab conditional to treatment response and CRS-control.



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Optimizing the local delivery of corticosteroids for chronic rhinosinusitis

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Intranasal corticosteroid sprays (INCS) are a mainstay treatment for patients with CRS, however, their efficacy is suboptimal due to inconsistent drug delivery and limited penetration deep into the sinonasal passages. The rapid mucosal clearance rates from the nasal cavity and daily dosing regimens of INCS are augmented by poor patient adherence. Approximately half of patients with CRS inadequately respond to medical treatments including INCS, making them potential candidates for sinus surgery. Recent advances to optimize local corticosteroid treatment, such as EDS-FLU and sinonasal implants, aim to address the limitations of INCS and have been shown to reduce nasal polyp burden, post-operative outcomes, and/or CRS cardinal symptoms. However, these therapies are only indicated for certain subsets of patients with CRS. In the development pipeline for CRS are LYR-210 and LYR-220, bioresorbable drug matrices designed to conform to the middle meatus or operated ethmoid cavity, respectively, and release mometasone furoate for up to 24 weeks in a single administration. LYR-210 demonstrated clinically meaningful symptom improvement and decreased ethmoid opacification and the need for rescue treatment after 24 weeks of treatment in the randomized, controlled LANTERN study. If these results are confirmed in ongoing clinical trials, LYR-210 and LYR-220 may be a promising therapeutic option for patients with CRS.

1519

Reimbursement criteria drive the choice for a specific biologic in severe uncontrolled CRSwNP patients in Belgium

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Background: Since 2022, mepolizumab and omalizumab are reimbursed for severe uncontrolled chronic rhinosinusitis with nasal polyps (CRSwNP) in Belgium. The reimbursement criteria for omalizumab are stricter than for mepolizumab, as the presence of asthma and a nasal polyp (NP)-score of minimum 4 out of 8 are required. **Aim and objective:** Investigate the impact of reimbursement criteria on patients with CRSwNP prescribed a biologic in Belgium in 2022. **Methods:** Patients from 6 medical centers in Belgium, prescribed a biologic for CRSwNP, were studied. The baseline characteristics (demographics, medical history, NP-score and SNOT-22 score) were analyzed in relation to their eligibility for either biologic. **Results:** Fifty patients were included in the trial, with a mean SNOT-22 score of 45 ± 20.77 and mean NP-score of 5 ± 1.78 . Respectively, 100 % and 57% of these patients met the reimbursement criteria for mepolizumab and omalizumab. In reality, 89% of patients were started on mepolizumab, and only 11% on omalizumab. Interestingly, 51% of the patients prescribed mepolizumab did also fulfil the criteria for omalizumab. The median NP-score of patients on omalizumab tended to be higher with a mean score of 6 ± 1.22 instead of 4 ± 1.8 with mepolizumab. The mean SNOT-22 score was similar in both groups with 43 ± 28.8 and 45 ± 19.7 for omalizumab and mepolizumab, respectively. **Conclusion:** Since the reimbursement of biologics for CRSwNP, reimbursement criteria seem to have a considerable influence on the prescribed biologic, with 89% of patients prescribed Mepolizumab.



Allergic Rhinitis, Non Allergic Rhinitis

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Unified Airways: is hyperreactivity 'unified' as well?

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Introduction: The upper and lower airways are linked at several levels as a unified airways system. Nasal hyperreactivity (NHR) is a common feature of chronic rhinitis, whereas bronchial hyperresponsiveness (BHR) is a key feature of asthma. Previously, we showed superior nasal reactivity to cold-dry air versus histamine (Braat, AJRCCM 1998). However, little is known of a possible association between NHR and BHR in chronic rhinitis. In the current study we explored the association between NHR and BHR in subjects with chronic rhinitis. **Methods:** Non-smoking subjects (M/F; 18-70 y) with non-allergic rhinitis (NAR), allergic rhinitis (AR) and healthy controls (HC) underwent a cold-dry air challenge to assess NHR and a histamine bronchoprovocation to test BHR on two separate days. **Results:** 34 subjects completed the study (12 NAR, 11 AR, 11 HC); 16 (5 AR, 6 NAR, 5 HC) presented with a positive response to cold-dry air (decline in PNIF $\geq 20\%$) and 9 (7 AR, 2 NAR) reached a PC20histamine



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A calendar of pollen and fungi over a three-year period in Northeast Greece.

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Introduction: Differences in airborne allergens exist between different countries, but also between regions of the same country. Pollen calendars have been proved important in allergic management. This study provides new data concerning the atmospheric pollen and fungi content of Western Thrace in North-East Greece and presents their seasonal differences over the years, and association with climate parameters. Material and methods: A volumetric trap was used to collect and count circulating pollen grains and fungi spores. The primary allergenic pollen season was identified, and their 10-day averages were measured over time. Correlations with temperature, rain, and humidity were assessed. Results: Pollen grain families (five arboreal, two nonarboreal taxa, and spores from two fungi species) were identified. The three most prevalent taxa were Oleaceae, Poaceae, Pinaceae, and Cladosporium in the fungi. Peak pollen concentrations were detected during April and May and Poaceae presented the longest pollen season. Cladosporium was the fungus with the highest spore concentration and variable associations with meteorological parameters (rainfall and relative humidity) were noted. Conclusion: Our study presents the pollenic and fungal spectrum of a Mediterranean region, and information, that can be proved significant for the appropriate diagnostic and therapeutic approach of allergic patients.

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Future-coming antigen-specific immunotherapy (IT) for patients with allergic rhinitis: mucosal route of IT (sublingual or per os) or regional intralymphatic IT (ILIT), using high dose of allergenic epitopes delivery system

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Allergic Rhinitis, Non Allergic Rhinitis | Room 9 - Olympic Hall - Level 0 | Tuesday 20/06/2023

Introduction and summary Allergen-specific subcutaneous immunotherapy (SCIT) with house dust mite (HDM) and Japanese cedar pollen extract has long been employed to desensitize patients with perennial allergic rhinitis and cedar pollinosis in Japan. SLIT with HDM and cedar pollen extract is most recently developed and permitted in Japan to be utilized in clinical routine as a more safe and effective method. For the last decade, we have been investigating the therapeutic effect of mucosal route of administration and its mechanism, employing with ovalbumin (OVA) or transgenic rice (Tg-rice) seeds, which contain T-cell epitopes of Cryj1 and Cryj2, on murine allergic rhinitis models at the induction and eliciting phase and reported its clinical efficacy to actually attenuate nasal symptom^{1,2,3}. In this presentation, we would like to summarize our experimental data in mice and discuss the mechanism of it, based on immunological tolerance with high dose antigen loading, in comparison with SLIT and ILIT. References 1. Hidenori Takagi et al : A rice-based edible vaccine expressing multiple T cell epitopes induces oral tolerance for inhibition of Th2-mediated IgE responses. *PRONAS* 2005;102(48):17525-17530. 2. Takaya Yamada et al. Sublingual immunotherapy induces regulatory function of IL-10 expressing CD4⁺CD25⁺Foxp3⁺ T cells of cervical lymph nodes in murine allergic rhinitis model. *J Allergy* 2012: ArticleID 490905, 11 pages doi:10.1155/2012/4909053. Yinfei Qu et al. Sublingual immunotherapy attenuates nasal symptoms upon allergen exposure in murine allergic rhinitis model via an induction of IL-10 producing T cells in submandibular lymph node. *Ann Otol Rhinol Laryngol* 2019 Jun;128(6_suppl):26S-35S. doi: 10.1177/0003489419835848. 4. Hideyuki Kawauchi: Mucosal Regulatory System for the Balanced Immunity in the Middle Ear and Nasopharynx. Chapter 18, *Mucosal Vaccines* edited by H Kiyono, D Pascal, chapter 18, 2020 Elsevier Inc.

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The role of NLK on the pathogenesis of Chronic rhinosinusitis with nasal polyps

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Chronic rhinosinusitis is an inflammatory reaction disease with its pathogenesis still unclear. In this experiment, The Nemo-like kinase and part of inflammatory mediators content of sixty patients of chronic rhinosinusitis with nasal polyps were compared with thirty patients with nasal septum deviation. The content of Nemo-like kinase in polyp and turbinate tissue was detected by immunohistochemistry. Moreover, the levels of IL-5, IL-6 and GSK-3 β in the peripheral blood were compared between the two groups by ELISA. The data obtained were statistically analyzed using SPSS software. Correlation among these parameters was performed by Pearson correlation analysis. Each data analysis was repeated three times. The immunohistochemistry exposed that The percentage of positive areas of Nemo-like kinase in the polyp tissue in the experimental group was extremely significantly higher than control; The ELISA detection indicated that The serum levels of IL-5, IL-6 and GSK-3 β in the experimental group were significantly higher than control; Correlation analysis exhibited that The concentration of IL-6 was positively correlated with the percentage of positive areas of Nemo-like kinase ($r=0.377$, $P=0.013<0.05$). There may be a certain synergy between IL-6 and Nemo-like kinase, and the regulation mechanism is under further investigation.

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Late phase IL-13 production corresponds to the clinical late allergic response following birch pollen nasal allergen challenge

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Background: Nasal allergen provocation studies have shown biphasic nasal responses to provocation termed early (EAR) and late allergic responses (LAR). To date no clear methods have been discovered to identify those at risk of developing LAR. **Objective:** In this study we set out to thoroughly characterise immunological events and clinical nasal responses in the EAR and LAR. **Methods:** 30 eligible birch-allergic patients were challenged intranasally with either birch extract (n=20) or placebo (n=10) on 3 consecutive days, 24h sampling time courses took place on provocation days 1 and 3. Clinical responses were assessed and a panel of 33 inflammatory mediators were measured in nasal secretions. **Results:** Patients provoked with birch all showed significant drops in nasal airflow and rises in symptom scores. Birch-challenged patients saw significant increases in tryptase and sST2 in the EAR. 8/20 birch provoked patients displayed significant IL-13 responses in the LAR. These patients were also the only ones that showed a significant drop in nasal airflow and significant rises of Th2 cytokines as well as IL-6, sST2, EDN and TSLP in the LAR. **Conclusion:** Patients with significant IL-13 responses in the LAR were the only patients to display significant clinical and cytokine responses in this phase. **Funded by** the Austrian Science Fund FWF: DK W 1248-B30, SFB F4605, SFB F4613, Medical Scientific Fund of the Mayor of the City of Vienna AP18092BGM and the Medical University of Vienna



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ALLERGY PROFILE IN A MULTI ETHNIC POPULATION AND ITS CORELATION TO SINONASAL OUTCOME TEST (SNOT-22) SCORES- A CROSS SECTIONAL STUDY.

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PURPOSE OF THE STUDY: Epidemiological studies with reference to allergy profile in mixed populations are very few, more so regarding its relationship to nasal symptom severity. This study intended to evaluate the allergy profile of a multi ethnic population and also to find a correlation between variations of allergy profile and SNOT score of patients. SNOT-22 domains have not been validated specifically for nasal allergic condition. **MATERIALS AND METHODS:** Analysis of patient data collected in a prescribed paper and google link format with regard to their allergy profile which included Eosinophil count, nasal smear for eosinophil, total serum Immunoglobulin E, Respiratory allergy test for presence of IgE antibodies to specific aeroallergens and food allergy test for presence of IgE antibodies to specific food allergens. The 22-item Sinonasal Outcome Test (SNOT-22) is a validated chronic rhino-sinusitis health-related quality-of-life outcome (HRQoL) measure and was measured for all patients on the first visit. **RESULTS:** Airway allergy is a common finding in an admixed and multi-ethnic population living in an urban environment. A total of 50 cases with high total serum Immunoglobulin E and positive respiratory and/ or food allergy were evaluated in this cross sectional study. Total IgE levels correlated well with both SNOT-22 score and nasal smear. Respiratory allergy test correlated more with total Ig E levels compared to food allergy test. The most common aeroallergens in the respiratory allergy test were Dermatophagoides pteronyssinus(DP) and Dermatophagoides farinae(

**1762**

Global Distribution, Discontinuation, and Non-publication, and Characteristics of Clinical trials on Chronic Rhinitis; Analysis of Registered Studies on clinicaltrials.gov

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IntroductionChronic rhinitis is long-lasting inflammation of the nasal passages that affects about 15-30% of the population worldwide at some point in their lives. This study examined the global distribution, non-publication, discontinuation, and characteristics of registered clinical trials of chronic rhinitis. **Methods**We searched clinicaltrials.gov for all registered clinical trials using the keywords "Chronic Rhinitis". Search results were exported from the database. Data about the publications were obtained by manually searching PubMed and Google Scholar using the clinical trial identifiers. Statistical analysis was done using Jamovi for macOS. **Results**A total of 306 studies registered on clinicaltrials.gov were included in the analysis. Of them, 247 were clinical trials (80%), while 59 were observational (19.3%). Biological agents were investigated in 32 studies (10.5%). Most studies (n=232, 88%) were conducted in high-income countries, and none were registered in low-income countries. Most studies were conducted in the US (54.9%) and Canada (11.7%). Results were available for only 69 studies (22.5%). 30% of registered studies were either suspended, terminated, withdrawn, or with unknown status, and 224 were never published (73.2%). **Conclusion**Most registered studies in chronic rhinitis are conducted in high-income western countries, reflecting the need for local research in low- and middle-income countries. Owing to the high discontinuation and non-publication rates, more robust data-sharing and collaboration methods are needed to support rhinology clinical trials.

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Cases with non-allergic rhinitis with IgG4-tissue accumulation in elderly

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Rhinitis in elderly shows non-typical and varied nasal signs due to heterogenous changes of nasal function due to aging. These include volume reduction of nasal glands, thinness of ciliated epithelial cells and fibrosis of lamina propria, leading to atrophy of nasal mucosa. On the other hand, some elderly show hypertrophy of nasal mucosa, which promotes severe nasal congestion. Here, we reported the cases aged over 60 showing substantial infiltration of IgG4-positive cells into nasal mucosa. All cases were male, and had a hypertrophy in anterior part of inferior turbinate, leading to nasal congestion as a chief complaint. None of the patients complained hyprethetic paroxysmal nasal symptoms such as sneezing or itching. One patient exhibited a high level of serum IgG4. Another patient had a cormobid rhinosinusitis. All the patients received endoscopic mucosal resection of bilateral anterior part of inferior turbinate. After surgery, symptoms and objective nasal passage were improved with the use of intranasal corticosteroid. In case of hypertrophic rhinitis with severe swelling especially in the anterior part of the inferior turbinate in elderly, non-allergic rhinitis with IgG4-tissue accumulation (NARITA) should be suspected.



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Correlation between nasal provocation tests and rhinologic clinical evaluation in a cohort of 67 patients with occupational rhinitis

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The objective of this study was to investigate the relationship between clinical symptoms of patients suffering from occupational rhinitis (OR) and nasal provocation test (NPT) positivity and secondly between NPT results and rhinoscopic status and quality-of-life score based on the 22-item Sinonasal Outcome Test (SNOT22). We conducted an observational study including subjects consecutively referred to our center for suspected OR performing clinical and occupational examination, nasal endoscopy, immunological tests and pulmonary function tests. Nasal provocation tests (NPT) were performed using posterior active rhinomanometry with 5 different agents (didecyltrimethylammonium chloride (DDAC), benzalkonium, persulfates, wood and flour). We compared patients with positive NPT versus negative NPT. During a study-period of 3 years, 67 patients were included. Forty- one NPT were performed with quaternary ammoniums, 20 with persulfates, 4 with wood and 2 with flour. There was no correlation between NPT positivity and age, type of agent tested, basal binasal resistances, pre-test symptoms score, rhinologic evaluation and SNOT22 results. A positive NPT was significantly more frequent in atopic patients. It confirms the difficulty to assume patients suffering from OR before performing the NPT and that NPT is the gold standard test in OR diagnosis, thus leading to occupational rehabilitation or preventive workplace measures.

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Cytological and biological markers for the diagnosis of local allergic rhinitis: A meta-analysis and adjusted indirect comparison of diagnostic test accuracy

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Allergic Rhinitis, Non Allergic Rhinitis | Room 9 - Olympic Hall - Level 0 | Tuesday 20/06/2023

Background There is insufficient direct or indirect evidence of all current techniques for diagnosing local allergic rhinitis (LAR). Nasal provocation test (NPT) is a key diagnostic tool for LAR. Cytological and biological markers are investigated to provide convenient approaches without a misdiagnosis of LAR. **Methods** Systematic searches on five electronic databases were performed for human studies comparing the accuracy between NPT and index tests (cytological and biological markers) for diagnosing LAR. Pooled outcomes, including sensitivity, specificity, positive likelihood ratio (PLR), negative likelihood ratio (NLR), and diagnostic odds ratio (DOR), were calculated. Relative diagnostic outcomes between index tests were computed using the indirect comparison of modalities. **Results** Eighteen studies met the inclusion criteria. Compared to NPT, nasal eosinophilia on nasal cytology had the highest sensitivity but the lowest specificity. Nasal-specific IgE (nsIgE) had the lowest sensitivity and the highest specificity. The basophil activation test (BAT) had good sensitivity and specificity. Comparisons among three index tests showed that nsIgE ranked among the highest for PLR and DOR while BAT ranked among the lowest for NLR. **Conclusion** Our study indicated that BAT had greater diagnostic values for LAR than nsIgE and nasal eosinophilia. Measurement of nsIgE is still challenging due to the low positivity rate.

Smell and Taste 3

1507

Prevalence and Persistence of Parosmia After COVID-19

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Smell and Taste 3 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Introduction: Persistence of COVID-19-associated chemosensory disturbances has been reported widely throughout the literature. Qualitative disturbances can have profound effects on olfactory-related quality of life. This study seeks to assess the prevalence and persistence of parosmia in COVID-19 patients and to correlate these findings with the Sniffin' Sticks Parosmia Test (SSParoT). **Methods:** Participants with self-reported olfactory changes completed questionnaires to evaluate for the presence of olfactory distortions (n=91) and to identify and characterize parosmia-triggering odors (n=37). Participants also underwent quantitative psychophysical testing with Sniffin' Sticks (TDI, SSParoT) across two distinct time points. Statistical analysis utilized paired-samples t-tests. **Results:** 73% (66/91) of participants endorsed parosmia at baseline assessment and 54% (19/35) of participants endorsed parosmia after one year. SSParoT evaluation demonstrated statistically significant increases in group averages (n=34) of both hedonic range (p=0.003) and hedonic direction (p<0.001) across one year. The most common parosmia-triggering scent was onion, and participant's familiarity with a scent was the most important factor in determining parosmia triggers. **Conclusions:** Parosmia affects many individuals after acute COVID-19 and may persist for longer than previously recognized. Given these persistent alterations in odor perception, further evaluation and validation of the SSParoT would allow for improved characterization.

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Relationship between cognitive complaints and olfactory measures in post-COVID-19 condition individuals

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Smell and Taste 3 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Introduction: Olfactory dysfunction (OD) is prevalent among COVID-19 patients, accompanied by fatigue, cognitive impairment and mood disorders resulting in the post-COVID-19 condition (PCC). Our objective was to investigate the relationship between OD and cognitive complaints (CC). **Methods:** Olfactometry was performed using Barcelona Olfactory Test. Participants assessed smell loss by visual analogue scale (VAS), Quality of Life (QoL) and completed the Spanish version of the Memory Failures of Everyday (MFE) Questionnaire, assessing memory forgetfulness and complaints. A linear regression was adjusting (alpha level was set at $p=0.05$). **Results:** 75 COVID-19 patients (mean age=51.21SD=6.40; mean years of education=13.80SD=3.50; mean days from acute disease=362.80SD=194.10). The MFE scores correlate positively with depressive symptoms ($R^2=.46; \beta=.502p=.0001$), women ($R^2=.46; \beta=.299p=.0001$) and negatively with odor detection ($R^2=.46; \beta=-.182p=.04$). These three factors accounted for 54% of the variance in CC. 62.7% affectation in QoL was observed with a higher VAS and older age. Subjective memory complaint is positively correlated with irritants ($C=.23p=0.04$) and negatively with pleasant odors ($C=-.31p=0.007$). **Conclusion:** CC are associated with depressive symptoms, women and poor odor detection, regardless of COVID-19 severity, age or educational level. With more CC, patients smell more irritating odors and less pleasant odors. If a post-COVID OD, the healthcare professional should refer the patient for a cognitive evaluation.



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The impact of olfactory disorders on personal safety and wellbeing: a cross-sectional observational study

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Smell and Taste 3 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Introduction: Olfactory dysfunction can expose individuals to day-to-day safety hazards. We sought to investigate the perceptions of safety, quantify the incidence of hazardous events, and how safety scares/incidents manifest through patient stories. **Methods:** Data was collected through an online survey between 25th February 2022 to 28th September 2022. The survey was distributed through Fifth Sense media channels and open to anyone who claimed to suffer from olfactory dysfunction. **Results:** Our survey collected responses from 432 individuals. The majority were female (79.6%), ages 41-70. Around a fifth (20.6%) were non-UK residents, encompassing 21 different countries. Covid-19 was the commonest cause of olfactory dysfunction (22%). Majority (85.9%) were worried about any form of safety due to their smell dysfunction. Specifically, 32.2%, 14.8%, 34.5%, 18.5% of participants have experienced at least one food incident, gas incident, gas scare, and work scare, respectively. Affected individuals have taken active measures to prevent adverse events at home (60.2%), but fewer measures are taken by either employers or the individual in question in the workplace. **Conclusion:** There is an unmet need in mitigating hazardous events for individuals with olfactory dysfunction. We suggest educating the public sector and high-risk sectors such as gas companies, and introduction of safety 'scratch and sniff' cards as a screening method. Regular assessment of an individual's olfactory ability similar to sight and hearing would allow proactive identification of vulnerable people

1640

The effect of Smell Training on COVID-19 induced Smell Disorders

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Smell and Taste 3 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

While smell training appears to be effective for post viral and posttraumatic smell disorders, its effectiveness in COVID-19 induced smell disorders is currently unknown. Therefore, we aim to investigate the potential effect of smell training on patients with COVID-19 induced smell disorders. We conducted a prospective case-control study for which we included two comparable cohorts. One of which (n=111) was instructed to perform smell training twice daily for 12 weeks, and therapy compliance was monitored on a daily schedule, while the other cohort (n=47) did not perform smell training. The Sniffin' Sticks Test (SST) was used to objectify the participants' sense of smell over the course of 12 weeks, reported as a Threshold, Discrimination, and Identification (TDI) score. Prior to and following the training period, these measurements were taken. Results showed a significantly better sense of smell after 12 weeks in patients who performed smell training compared to those who did not. Median difference was 3.00 (95%CI 1.00-5.00; p =0.004). This study suggest a potential beneficial effect of smell training for patients with COVID-19, to corroborate our findings this should ideally be demonstrated in a randomized controlled trial.



1670

High-dose IgG regenerates injured olfactory system by suppressing local inflammation

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Smell and Taste 3 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Objective: Head trauma can be a cause of refractory olfactory dysfunction due to olfactory nervous system injury. Anti-inflammatory treatment using steroids or anti-cytokine agents is known to contribute to functional recovery of the central and peripheral nervous systems in injury models, while there is a concern that they can induce adverse reactions. The present study examines if high-dose immunoglobulin G (IgG) can facilitate olfactory functional recovery following injury. **Methods:** Olfactory nerve transection (NTx) was performed in OMP-tau-lacZ mice to establish injury models. High-dose IgG was intraperitoneally injected immediately after the NTx and histological assessment of recovery within the olfactory bulb was performed at 5, 14, 42 and 100 days after the drug injection. X-gal staining labeled degenerating and regenerating olfactory nerve fibers and immunohistochemical staining detected the presence of reactive astrocytes and macrophages/microglia. Olfactory function was assessed using an olfactory avoidance behavioral test. **Results:** High-dose IgG-injected mice showed significantly smaller areas of injury-associated tissue, fewer astrocytes and macrophages/microglia, and an increase in regenerating nerve fibers. An olfactory avoidance behavioral test showed improved functional recovery in the IgG-injected mice. **Conclusion:** These findings suggest that high-dose IgG could provide a new therapeutic strategy for the treatment of olfactory dysfunction following head injuries.



1671

High-sulfur and nitrogen foods are the main triggers of parosmia

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Smell and Taste 3 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Background: Parosmia is a condition associated with a significant impact on quality of life, and although its pathophysiology is still not well understood, some aromas and fragrances are commonly reported as triggers. The aim of our study is to determine the main parosmia triggers and analyze molecular similarities between them. Methods: This was a cross-sectional study that evaluated subjects with current complaints of parosmia. Data were collected prospectively using an online survey that assessed the main triggers and the perceptions associated with them. A perfumer analyzed the molecular characteristics of these substances. Results: In total, 97 parosmic subjects were included. The main triggers described were onion (68%), garlic (62.9%), coffee (49.5%), and beef (48.5%). These substances share sulfurous, nitrogenous, and thioester components that have high aromatic potency and sensorial notes of "rotten", "sulfurous", and "toasted/burned". The most common perceptions associated with them were sewage (71%) and burned (37.6%). Discussion: The main parosmia triggers apparently have important molecular similarities. This knowledge can contribute to a better understanding of parosmia pathophysiology and represent a first step in the development of new treatments for this disorder.

1724

Changes in pediatric patients with olfactory disorders before and after COVID-19 pandemic

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Smell and Taste 3 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Purpose Pediatric patients consist of approximately 1.6-2.3% of all olfactory disorder patients. However, this number was studied before the COVID-19 pandemic and there are no reports after the pandemic. We investigated the proportion of pediatric patients and compared before and after the COVID-19 pandemic. **Method** Patients who visited our smell clinic from January 2009 to December 2022 were included in the study. The patients were divided into two groups, one from January 2009 to March 2020 (before pandemic), and the other from January 2021 to December 2022 (after pandemic). Patients from April 2020 to December 2020 were excluded because of frequent emergency declarations and hospital lockdowns in Japan. The percentage of pediatric patients and the causes of the olfactory disorder were investigated. **Results** Before pandemic, the percentage of pediatric patients was 1.3% (31/2342) and the most common causes were olfactory cleft stenosis (26%, 9/35) and congenital olfactory disorder (17%, 6/35). After pandemic, the percentage was 5.4% (22/409) and COVID-19-related olfactory disorder (45%, 10/22) was the most common cause, while olfactory cleft stenosis and congenital olfactory disorder were both 9.1% (2/22). **Conclusion** The percentage of pediatric patients before pandemic was similar to that previously reported, but after pandemic the percentage of pediatric patients quadrupled. The causes of the olfactory disorder were also found to have changed, with COVID-19-related olfactory disorders accounting for the majority of cases.



1737

Does Trigeminal Neuralgia Have an Effect on Olfactory Functions and Sinonasal QoL?

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Smell and Taste 3 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Objective: Olfactory and trigeminal system has close relationship. Most odor stimulate trigeminal system in addition to olfactory system. Studies showed olfactory loss may affect trigeminal system. However, effect of trigeminal system on olfaction is still a dilemma. The aim of the study is to evaluate olfactory functions, sinonasal QoL of the patients with trigeminal neuralgia and to compare them with normal population. **Material Methods:** A total of 52 participants (26 with TGN and 26 normal control) were included in this study. Anterior rhinoscopy, Modified Sniffin Stick Test (MSST) and SNOT 22 were done. **Results:** There was no statistically significant difference between TGN, and control group detected. Compared to control group SNOT-22 score averages found to be higher in TGN group ($p=0,005$). There was no statistically significant difference in SNOT 22 and MSST scores between medically treatment and combined (medical and invasive) treatment of TGN. The mean identification and discrimination scores were higher in TGN treated only medically ($p=0,005$). Mean SNOT-22 scores was higher in group with TGN getting combined therapy ($p=0,005$). **Conclusion:** Recent studies showed dynamic relationships between olfactory and trigeminal system. Our study showed there is no detectable clinical effect of trigeminal neuralgia on olfaction. However as expected QoL affected in cases with TGN significantly. There is a need for further studies including electrophysiological examination results to have a complete assessment of the relationship between trigeminal and olfactory systems.

1775

Development of a new olfactory test for clinical practice: Santa Casa de São Paulo Olfactory Test (SCOT)

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Smell and Taste 3 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Background: Despite being widely used in research, psychometric tests are rarely used to assess olfactory function in clinical practice, due to the high cost, time and complexity of application. The objective of this study is to develop the prototype of a new psychophysical test, that evaluates both the olfactory threshold and identification capacity, and is feasible to be applied in clinical routine. **Methods:** The SCOT consists of 12 bottles containing essences developed and standardized by a perfume and flavor industry, that are presented to patients through scent strips, disposable, and widely used in perfumery. The olfactory threshold is determined by the lowest concentration of n-butanol (1.35%, 0.45%, 0.15%, 0.05% or 0.015%) that the patient is able to differentiate from an identical scent strip soaked in water. The identification test is evaluated by the number of essences that the patient is able to recognize among coffee, onion, cinnamon, orange and chocolate, in addition to menthol (trigeminal test). 20 patients without olfactory complaints underwent SCOT on two occasions separated by at least 30 days. The average application time was 6:12 minutes. All patients and examiners reported easy understanding in answering and applying the test and high agreement between visits. **Discussion:** SCOT may allow the universalization of the psychophysical smell test in clinical practice, as it presents aromas that are common in different cultures, is complete (both threshold and identification tests), has a low cost, and is quick and easy to apply. Further validation is needed.

1784

Quantitative assessment of olfactory quality in patients with parosmia after COVID-19 infection, and the role of therapeutic adherence in olfactory improvement

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Smell and Taste 3 | Room 10 Peroto - Level 0 | Tuesday 20/06/2023

Introduction: SARS-CoV-2 infection may be associated with long-term complications affecting quality of life, such as quantitative and qualitative changes in olfaction. While a suitable tool has long been available to assess olfactory impairment, a modified version of the Sniffin' sticks test (SSParoT) has been described to assess qualitative changes in olfactory function during the pandemic, with which little experience is available. **Aim:** To assess and quantify the olfactory function of patients with parosmia in a prospective study and to investigate the changes in different parameters during the control and the role of therapeutic adherence. **Methods:** 38 patients with parosmia (26 women, 12 men, mean age 41.27 and 42.91 years, respectively) were tested with Sniffin' stick and SSParo test at baseline and 3-month follow-up. Between the two studies, patients were advised to perform olfactory training. An olfactory diary was used to assess treatment adherence. Measured values (TDI threshold, discrimination, identification, HR-Hedonic range, HD-Hedonic direction) were compared and analysed according to therapeutic adherence. **Results.** 15 patients completed at least 50% of the training (group 1), 23 patients trained less (group 2). At baseline, the mean TDI was 25.75 (24.91 and 26.64, respectively), the mean HR was 1.52 (0.68 and 2.29, respectively), and the mean HD was 0.44 (0.23 and 0.63, respectively). Group 1 TDI mean during control was 26.73 ($p=0.226$ vs. baseline), while that of group 2 was 31.1 ($p=0.006$ vs. baseline). The HR and HD control values for group 1 were 2 ($p=0.001$) and 1.045

Rhinology – miscellaneous 2

1420

Impact of LYR-210 corticosteroid matrices on SNOT-22 subdomains in patients with chronic rhinosinusitis from the Phase 2 LANTERN study

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Rhinology – Miscellaneous 2 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Background: LYR-210 is an implantable corticosteroid matrix being developed as a 24-week treatment for chronic rhinosinusitis (CRS). LYR-210 demonstrated dose-dependent and significant improvement in the SNOT-22 total score vs. control, with all LYR-210 (7500µg) subjects achieving the 8.9-point minimal clinically important difference (MCID) at week 24 in the LANTERN study. This report evaluates the change from baseline (CFBL) and proportion of responders for the SNOT-22 subdomains. **Methods:** Adults with CRS who failed previous medical management enrolled in the patient-blinded, randomized, controlled LANTERN study and received sham-procedure control (N=23), LYR-210 (7500µg) (N=21), or LYR-210 (2500µg) (N=23). MCID thresholds for the rhinologic, extranasal rhinologic, ear/facial, psychological dysfunction, and sleep dysfunction domains are 3.8, 2.4, 3.2, 3.9, and 2.9, respectively. CFBL and MCID response were analyzed using ANCOVA and logistic regression. **Results:** LYR-210 demonstrated dose-dependent improvement with LYR-210 (7500µg) achieving statistical significance in each SNOT-22 subdomain vs. control at week 24. Mean rhinologic, ear/facial, extra-nasal rhinologic, psychological, and sleep domain scores decreased by 10.0, 8.0, 5.2, 15.2, and 10.3 points from baseline at week 24 in the LYR-210 (7500µg) arm, respectively. LYR-210 (7500µg) subjects achieved more than 2x the MCID in each SNOT-22 subdomain at week 24. **Conclusions:** LYR-210 (7500µg) demonstrated clinically meaningful global symptom improvement in the LANTERN study and may be a promising treatment for CRS.

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Significant correlation between the SNOT-22 and 3-cardinal symptom composite score at 24 weeks in patients with chronic rhinosinusitis from the Phase 2 LANTERN study

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Rhinology – Miscellaneous 2 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Background: LYR-210 is an implantable matrix being developed for chronic rhinosinusitis (CRS) that gradually releases mometasone furoate to the sinonasal mucosa for 24 weeks. LYR-210 (7500µg) significantly improved the SNOT-22 and 3 cardinal symptom composite (3CS) scores at week 24 in the LANTERN study. 3CS (range 0-9) includes 0-3 scores for nasal blockage, nasal discharge and facial pain. This report evaluates the correlation between SNOT-22 and 3CS at week 24. Methods: Adults with CRS who failed prior medical management enrolled in the patient-blinded, randomized, controlled LANTERN study, and received LYR-210 (7500µg) (N=21), LYR-210 (2500µg) (N=23) or sham-procedure control (N=23). Correlation between change in SNOT-22 and 3CS at week 24 was evaluated using Pearson and Spearman methods and linear regression. Proportion of subjects with a ≥ 1 or ≥ 2 -point improvement in 3CS at week 24 was assessed with Fisher's exact test. Results: Changes in SNOT-22 and 3CS at week 24 were strongly ($r=0.76$) and significantly ($p<0.0001$) correlated. At week 24, subjects with a 1-point improvement in 3CS were expected to have an 8.2-point improvement in SNOT-22. Significantly higher proportions of LYR-210 (7500µg) vs control subjects improved by ≥ 1 point (100% vs 65%) or ≥ 2 points (90% vs 43%) in 3CS at week 24. The 3CS response was dose dependent. Conclusions: 3CS strongly correlates with SNOT-22 at week 24 in LANTERN and may provide a clinically relevant measure of the impact of treatment for CRS. 3CS is being assessed in ongoing Phase 3 studies of LYR-210.



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PYRIFORM TURBINOPLASTY AND LATERAL NASAL WALL LATERALIZATION: HOW WE DO IT – PRACTICAL HINTS

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Rhinology – Miscellaneous 2 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Pyriform Turbinoplasty (PT) is as an option for the management of turbinate hypertrophy. The philosophy and goal of the procedure are to improve the symptoms of a restricted airway while preserving function. We report a case of surgical management of inferior turbinate hypertrophy with PT and Lateral Nasal Wall Lateralization (LNWL). PT and LNWL improve nasal airflow of the nose providing a wider nasal cavity by acting directly into the bone of the inferior turbinate (IT). Sustained symptomatic improvement has been documented and is less susceptible to the influence of turbinate hypertrophy with other techniques. Further studies are needed in order to evaluate its morbidity and long-term impact in nasal airflow.



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Mucosal Leishmaniasis of the nasal vestibule after a 5 year latency period

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Rhinology – Miscellaneous 2 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Background Leishmaniasis is a parasitic disease spread by sandflies and is found in the tropics, subtropics and southern Europe. After initial cutaneous infection mucosal leishmaniasis can occur, sometimes after a considerable latency period. **Case presentation** A 60 year old male patient presented to ENT outpatients with right nasal vestibular swelling and a background of nasal obstruction being treated with mometasone nasal spray. On examination an inflamed right nasal aperture was seen and oral and topical antibiotics prescribed. No improvement was seen and at review significant fullness extending from nasal columella into the upper lip with erosion of the anterior septum was seen. Urgent CT, MRI and excision biopsy of the area was arranged. MRI demonstrated circumferential soft tissue thickening of the right nasal vestibule. Excision biopsy revealed widespread intracytoplasmic microorganisms. PCR confirmed *Leishmania Donovanii*. **Discussion** Differential diagnosis for nasal vestibule lesions include malignancy and infection. A travel history and of previous tropical disease infections is relevant. This patient later revealed a history of a non healing leg-ulcer secondary to cutaneous leishmaniasis following a trip to Greece in 2017. Local immunosuppression with mometasone may have led to recurrence of leishmaniasis in the nasal mucosa. The patient was referred to the leishmaniasis MDT and successfully treated.



1487

Implementation of Personalized Medicine in the predictive assessment of effectiveness and risk of treatment in patients with rhinologic disorders

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Rhinology – Miscellaneous 2 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Rhinologic pathology is complex and multifactorial in origin. The personalized approach to patients with rhinologic disorders is crucial for optimizing disease control and considering appropriate medical or surgical intervention to improve the effectiveness and clinical prognosis. The introduction of new biologic therapies in the targeted treatment of chronic airway diseases challenges physicians with the growing need for developing competencies regarding the pathophysiology of the inflammatory cascade, spectrum of rhinologic disorder endophenotypes and reliable immune-cell and mediator biomarkers involved in disease development, treatment and prognosis. Our study aims to analyze the current status of translational knowledge in rhinology, outline the perspectives for implementing personalized medicine (PM) in the clinical assessment of rhinologic disorders, and make evidence-based decisions about the most appropriate individual treatment. We conducted an online search in Pubmed and Scopus using keywords to identify relevant information about the application of PM in rhinology for the endotype-phenotype association, immunotherapy, predictive biomarkers, clinical guidelines and personalized treatment recommendations. Most of the publications focused on applying PM to rhinologic oncology and managing chronic rhinosinusitis by predicting phenotypes. We found insufficient evidence on the implementation of biomarker strategy to predict outcomes. This study outlines the current status of implementing PM in rhinology and barriers to its application in precision decision making.

1490

Identifying essential technical elements of endoscopic sinus surgery using a Delphi-methodology

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Rhinology – Miscellaneous 2 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Introduction Endoscopic sinus surgery is a common procedure performed by otorhinolaryngologists. It is performed for chronic inflammation and benign or malignant lesions. To the best of our knowledge, no study has identified essential elements of endoscopic sinus surgery based on a broad international consensus. In this study, we aimed to identify essential elements in endoscopic sinus surgery based on an international consensus among content experts invited by the European Rhinologic Society. The study is ongoing, but we will present the end product at ERS 2023 in Sofia. **Method** In close collaboration with the European Rhinologic Society content experts were invited to participate in this study. An international panel was established. Through three rounds of Delphi, items were identified, and important items were voted through and included in the final assessment tool. Content experts will finally deem whether the tool contains essential technical elements and if they find it useful in future training and assessment of junior doctors. **Results** 37 content experts were enrolled through an invitation forwarded by the European Rhinologic Society. Through a 3-round Delphi process approximately 27 items were identified. We are now in the process of the 3rd round where the final consensus is established. **Discussion** The use of international content experts in a Delphi panel contributes to the tool being of international relevance in future training and assessment of junior doctors. In a forthcoming study, we will validate the assessment tool.



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Anxiety Screening in Awake Rhinology Procedures

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Rhinology – Miscellaneous 2 | Room 11 Hall 3.3 - Level 7 | Tuesday 20/06/2023

Surgical procedures can evoke anxiety. COVID19 had resulted in an increased waiting list in the UK. In one of the efforts of decreasing the waiting list, adoption of awake surgical practice is on growing trend. Awake surgeries also known as office-based surgeries are procedures done under local anaesthesia. Most of the patients who are healthy and without co-morbidities do not undergo preoperative assessment. Anxiety is an emotion characterized by feelings of tension, worried thoughts, and physical changes like increase in blood pressure, heart rate and muscle tension. These physiological effects preoperatively and intraoperatively can impact surgical time and clearance and in worst case surgery may have to be abandoned. In this prospective study, 30 patients had State Trait anxiety scoring. The patients with higher scores suggesting anxiety were given propranolol. This showed improvement in the surgical outcomes and patient satisfaction. We suggest use of the State Trait anxiety scoring system for screening of anxiety which allows us to understand the state of mind, preoperatively for smooth procedure.

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Comparison between Prelacrimal Approach and Endoscopic Partial Maxillectomy: Quality of Life Outcomes

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Prelacrimal approach (PLA) has been gaining popularity in treating benign pathologies of the maxillary sinus, since it is thought to be well-tolerated, with minor post-operative morbidity. To the best of our knowledge, patient-reported outcomes comparing PLA to conventional endoscopic partial maxillectomy do not exist in the literature. In this study we used Sino Nasal Outcome Test-22 (SNOT-22) to assess the preoperative and postoperative quality of life in patients undergoing different types of medial maxillectomies. The study included 59 patients (37 male and 22 female, age range 16 to 91) affected by benign (38 cases) and malignant (20 cases) pathologies. 11 were treated via PLA and 48 with endoscopic partial maxillectomy - either as a standalone procedure or as part of another operation. The mean SNOT-22 score was 12 (SD 9,9) points for patients undergoing PLA and 20 (SD 18,6) for patients undergoing other types of endoscopic partial maxillectomy ($p=0.02$). Patients undergoing the latest, usually have a greater burden of disease, including both nasal and emotional/general symptoms compared to PLA patients; surgery results in improvement in both groups. Patients with benign pathologies had an average SNOT 22 of 15 versus 28 for those with malignancies, with $p=0.02$. However, after multiple regression analysis for all potential variables affecting SNOT 22 only type of pathology and gender, fit the model and were highly predictive of SNOT 22 postoperatively ($F=38$, $p<0.001$). Individual analysis of symptoms was also performed and is described.



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The musculoskeletal consequences of mouth breathing

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Nasal airflow is vital for craniofacial development and for upper airway muscle tone. However, more than 20% of adults and up to 60% of children are chronic mouth breathers and the most common cause of this is nasal obstruction. There is a well known strong correlation between chronic mouth breathing and bruxism. However, chronic mouth breathing is also associated with adaptive postural changes that impact the function of many other systems such as the stomatognathic system, the autonomic nervous system, the respiratory musculature, the Eustachian tube, temporomandibular joint and the cervical spine. The impact of nasal obstruction on general quality of life is well known. However, improving nasal airflow has other significant positive outcomes on body systems that have not yet been fully explored. This talk will explore the musculoskeletal consequences of chronic mouth breathing and will discuss the impact of nasal surgery in this context.



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Giant frontal sinus mucocele as a complication of craniofacial resection – case report

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Introduction: Giant frontal mucocèles are rare entities, resulting from sinus ostium obstruction, caused by inflammation, trauma, previous surgery or tumour. The aim of this work is to report a case of giant frontal mucocele after craniofacial resection and to demonstrate its marsupialization through endoscopic endonasal approach. **Material & Methods:** 62-year-old male patient, with a history of sinonasal carcinoma submitted to craniofacial resection with left orbital exenteration. Surgical defect was reconstructed through a transverse rectus abdominus myocutaneous flap. No signs of locoregional relapse were observed during the follow-up. Five years after the surgery, the patient referred a progressively enlarging tumefaction close to the left medial cantus, in the upper and medial side of the flap. Radiological imaging confirmed the diagnosis of a giant frontal mucocele. The patient was submitted to a modified Draf III procedure with marsupialization of the giant mucocele. **Results:** Six months after surgery there are no clinical/radiological signs of relapse. **Conclusions:** Giant frontal mucocèles can occur as rare complications of previous surgeries, when the reconstruction method leads to an entrapment of normal mucosa. It is important to recognize this entity and the management, through an endoscopic endonasal approach to create a large pathway for frontal drainage, is safe and effective.

CRS – pathophysiology 2

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Is there a role for *Staphylococcus pseudintermedius* in resistant chronic rhinosinusitis?

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CRS – pathophysiology 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Background: *Staphylococcus pseudintermedius* is an emerging zoonotic pathogen closely related to *S. aureus* and has been found in the nares of immunosuppressed patients, including 13% of granulomatosis with polyangiitis patients. There is limited information regarding its prevalence and virulence in chronic rhinosinusitis. In our cohort of 40 CRS patients, we identified 2 cases. **Methodology:** Nasal swabs and demographics were obtained from patients with CRSsNP and CRSwNP. Swabs were tested for the presence of *Staphylococcus* species and sequenced using Illumina paired read whole genome sequencing and interrogated using the Bactopia pipeline. **Results:** In our cohort 5% of patients with CRS cultured *S. pseudintermedius*, both had evidence of underlying immunosuppression. Genomic sequencing surprisingly demonstrated fewer antimicrobial resistance genes than *S. aureus*. Beta-lactam resistance genes (*blaPC1*, *blaR1*, *blaI*, *blaZ*) seemed conserved throughout staphylococcal species however the virulent multidrug resistance *qacG/J* genes were identified which was not observed in any *S. aureus* cultured (*n*=13). **Conclusions:** *S. pseudintermedius* affects a limited number of patients with CRS but has been shown to be highly multidrug resistant. This may be due to the *qacG/J* gene, however it is likely the organism demonstrates a higher number of drug resistance mechanisms which are as yet unrecognised.



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Predictive significance of immunohistochemistry for inflammatory mediators in CRSwNP

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Introduction: the phenotype of chronic rhinosinusitis with nasal polyposis (CRSwNP) in most cases is characterized by Th2 inflammation, the dominant role of cytokines that promote IgE production and eosinophilic inflammation. **Objective:** the aim of the study was to determine the role of the Th2 inflammatory profile in the pathophysiology of CRSwNP, and its association with clinical parameters of the disease. **Method:** the study included 120 patients with CRSwNP and 70 patients of the control group. Basic demographic data, subjective and objective clinical parameters, immunological tests were registered for all subjects. Pathohistological analysis included the morphological structure and degree of inflammation. Immunohistochemical analysis was used to detect the expression of IL-5, IL-13 and IgE in the tissue. **Results:** We demonstrated a significant predominance of Th2 inflammation markers (IL-5 and IgE) in polyp tissue. A significant degree of inflammation was found in polyp tissue with positive expression of IL-5, IL-13 and IgE. **Conclusion:** The dominant model of CRSwNP endotype, Th2 inflammation mediated by significant expression of IL-5 and IgE, conditions eosinophilic predominance in polyp tissue, clinically and radiologically more severe forms of the disease.

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Oxidant/antioxidant imbalance induces inflammation in chronic rhinosinusitis with nasal polyps

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Background: Oxidative stress is involved in the pathophysiological process of chronic rhinosinusitis with nasal polyps (CRSwNP), but the specific mechanism is still unclear. Whether antioxidant therapy can treat CRSwNP needs further investigation. **Methods:** Immunohistochemistry, western blotting and quantitative polymerase chain reaction analyses (qPCR) were performed to assess the oxidative status and antioxidative defense in nasal polyps tissue. Correlation was examined by qPCR between oxidase, antioxidant and inflammatory cytokines in CRSwNP patients. HNEpC and primary macrophages were cultured to track the cellular origin of oxidative stress in nasal polyps and estimate whether antioxidants can reduce cellular inflammation by enhancing antioxidant capacity. **Results:** The expression of NOS2, 3-NT, NOX1, HO-1 and SOD2 was increased and was enriched in nasal epithelial cells and macrophages of nasal polyps. Inflammatory cytokines were positively correlated with oxidase and negatively correlated with antioxidant enzymes. Crocin, an antioxidant, enhanced antioxidant ability to reduce inflammation via the KEAP1/NRF2/HO-1 pathway in HNEpC. Moreover, crocin could inhibit the polarization of M1 and M2 and improve antioxidant enzymes expression in M2 polarization. **Conclusion:** Oxidative stress plays an important role in the development of CRSwNP by promoting various types of inflammation. Inhibition of oxidative reaction by crocin could reduce inflammation via the KEAP1/NRF2/HO-1 pathway. Therefore, antioxidant therapy may be a promising strategy for CRSwNP.



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Recurrence of severe chronic rhinosinusitis with nasal polyps after multiple surgeries: could the inflammatory pattern predict a "recalcitrant" disease?

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Background. Functional Endoscopic Sinus Surgery (FESS) still represents the upfront therapy for chronic rhinosinusitis with nasal polyposis (CRSwNP). Nevertheless, polyps' recurrence can occur also after an adequate surgical approach, thus defining a cohort of "Recalcitrant" CRSwNP patients. **Methods.** We enrolled 173 patients affected by severe diffuse CRSwNP. Patients were subdivided in a case group (A; n= 40) including patients who underwent more than 1 FESS and in a control group (B; n=133), including patients never treated or who underwent 1 FESS. We analysed in nasal secretions the levels of IL-5 and calprotectin, respectively markers of eosinophilic and neutrophilic inflammation. **Results.** Some clinical features were associated to higher risk of recalcitrant CRSwNP: intolerance to ASA ($p < 0.0001$), asthma ($p < 0.05$), high blood eosinophil count ($p < 0.0001$). Group A showed higher levels of calprotectin ($p < 0.01$) and IL-5 ($p < 0.05$) in nasal secretions. The nasal cytology revealed that neutrophil count was much higher in patients of Group A compared to those of group B ($p < 0.01$). The levels of both IL-5 and calprotectin exponentially increase proportionally with the number of surgical interventions. **Conclusions.** Our research demonstrated a predictive role of type 2 biomarkers in stratifying patients on the base of the inflammatory load, with a non-invasive diagnostic procedure.

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Tissue IL-13+ percentage of inflammatory cells, tissue eosinophils per field of view and relationship with clinical and imaging findings in patients with chronic rhinosinusitis with nasal polyps (CRSwNP): A pilot study in greek population

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Background: Current focus on understanding the pathophysiology of chronic rhinosinusitis is toward understanding the molecular pathways that have been activated.¹ IL-13 is a cytokine with an important role in type 2 inflammation initiation² as well as eosinophil activation and recruitment^{1,3,4}. SNOT-22 score, endoscopic appearance score and CT Lund-Mackay scoring system are well established and widely used methods for evaluating patients with CRSwNP. **Methodology:** We prospectively collected data by measuring tissue IL-13+ percentage of inflammatory cells by immunohistochemistry (IHC), tissue eosinophils per field of view (f.o.v.) (40x) and correlated them to SNOT-22 score, endoscopic appearance score and CT Lund-Mackay scoring system in patients with CRSwNP that were treated by endoscopic sinus surgery in our hospital. **Results:** Preliminary results of 46 patients (male-to-female ratio 1,6:1, mean age 47,3 y.o., range 22- 72), showed that 35% had > eos/f.o.v. Patients with > eos/p.o.f. had the highest percentage of IL13+ inflammatory cells and scored higher to SNOT-22 score, endoscopic appearance score and CT Lund-Mackay scoring system compared to patients with <0 eos/f.o.v. **Conclusions:** The correlation of biomarkers with clinical and imaging findings may guide more rationally the treatment of CRSwNP. Fokkens WJ, Lund VJ, Hopkins C, Hellings PW, Kern R, Reitsma S, Toppila-Salmi S, Bernal-Sprekelsen M, Mullol J. Executive summary of EPOS 2020 including integrated care pathways. *Rhinology*. 2020 Apr 1;58(2):82-111. doi: 10.4193/Rhin20.601. PMID: 32226949. Güllüev M, Yücel A, Kahraman ME, Bor MA. Measurement of some serum cytokines in nasal polyp and evaluation of its correlation with disease severity. *Eur Arch Otorhinolaryngol*. 2021 Sep;278(9):3345-3349. doi: 10.1007/s00405-020-06600-9. Epub 2021 Jan 15. PMID: 33452622. Laidlaw TM, Mullol J, Woessner KM, Amin N, Mannent LP. Chronic Rhinosinusitis with Nasal Polyps and Asthma. *J Allergy Clin Immunol Pract*. 2021 Mar;9(3):1133-1141. doi: 10.1016/j.jaip.2020.09.063. Epub 2020 Oct 13. PMID: 33065369. Schleimer RP. Immunopathogenesis of Chronic Rhinosinusitis and Nasal Polyposis. *Annu Rev Pathol*. 2017 Jan 24;12:331-357. doi: 10.1146/annurev-pathol-052016-100401. Epub 2016 Dec 5. PMID: 27959637; PMCID: PMC5514544.

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Beta-Adrenergic Sweat Secretion in Chronic Rhinosinusitis

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CRS – pathophysiology 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Introduction: Chronic rhinosinusitis (CRS) has an undefined etiology and may be associated with multiple factors and is probably caused by interactions between genetic, environmental factors and inflammation of the respiratory mucosa. The high prevalence of CRS among patients with Cystic Fibrosis (CF) suggests that the CFTR (Cystic Fibrosis Transmembrane Regulator) protein may contribute to the pathogenesis of CRS. **Objective:** Evaluate CFTR protein function using the evaporimetry technique, sweat test, presence of CFTR variant F508del and verify whether there is a correlation with the presence or absence of nasal polyposis. **Methods:** Adults with CRS, from the Rhinology outpatient clinic of the University Hospital of UNICAMP, who underwent nasofibroscope, measurement of electrolytes in sweat, measurement of beta adrenergic sweat rate using evaporimeter and genetic study for the F508del variant were evaluated. **Results:** 72 patients with CRS were evaluated, 14 without polyposis. Of the 58 with polyposis, 5% (11) presented, in response to the evaporimetry test, values that suggest CFTR-related disease, although without the F508del variant and normal sweat test. All those without polyposis had normal exams. **Conclusion:** Patients with CRS should be investigated for CFTR protein function and genetic variant.

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Type 2 endotype Staphylococcus aureus biofilm Secreted Factors cause mucosal damage, mast cell infiltration and goblet cell hyperplasia in vivo

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CRS – pathophysiology 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Chronic Rhinosinusitis (CRS) is an inflammatory condition of the paranasal sinuses mucosa. Despite being a common health issue, the exact cause of CRS is yet to be understood. However, research suggests that Staphylococcus aureus, particularly in the biofilm form, plays a role in driving the disease. This study aimed to investigate the impact of long-term exposure to secreted factors of Staphylococcus aureus biofilm (SASF), harvested from non-CRS carriers and CRS patients, on the nasal mucosa in a rodent model. Wistar rats were randomised (n=5/group) to receive daily intranasal instillations of 40 µL (200 µg/µl) SASF for 28 days or vehicle control with S. aureus isolated from the sinuses of a non-CRS carrier, a type 2 endotype CRS with nasal polyps (CRSwNP) patient, and a non-type 2 endotype CRS without nasal polyps (CRSSNP) patient. The sinonasal samples were then analysed through histopathology and transcriptome profiling. The results showed that all three intervention groups displayed significant lymphocytic infiltration (p<0.05). However, only the SASF collected from the CRSwNP patient caused significant mucosal damage, mast cell infiltration, and goblet cell hyperplasia compared to the control. The transcriptomics results indicated that the SASF significantly enriched multiple inflammatory pathways and showed distinct expression differences between the control group and the SASF collected from CRS patients (p<0.05). Additionally, the SASF challenges induced the expression of IgA and IgG, but no IgE was detected. In conclusion, this study indicates that long-term exp

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Microvessels quantification by fully convolutional neural networks and its association analysis with endotyping in chronic rhinosinusitis

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CRS – pathophysiology 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Background: The pathogenesis of highly heterogeneous chronic rhinosinusitis (CRS) is still unclear, and the angiogenesis of tissue remodeling has rarely been studied. **Objective:** We aimed to explore the tissue quantification of microvessels and their potential association with immune inflammation in CRS by using fully convolutional network (FCN), to exploit CRS more deeply and widely. **Methods:** For endotyping of CRS, tissue homogenates of 79 patients with CRS who had undergone FESS and 17 control subjects were analyzed for IFN- γ , TGF- β , IL-1 β , IL-5, IL-6, IL-8, IL-10, IL-17, TNF- α , ECP, IgE, SE-IgE. 552 HE stained images of 27 CRS tissue samples were used to develop a FCN, going through training, validation, and evaluation process. An optimized FCN was applied for quantifying the microvessels of tissue samples of all subjects. Correlation analysis between microvessels quantification with phenotype, endotype, clinical characteristics, and cytokines expression of CRS were carried out. **Results:** We found that tissue quantification of microvessels between type 2- and non-type 2 CRS had significant difference, with great higher expression in type 2 CRS than that of non-type 2 CRS. There existed a strongly negative correlation between the area ratio of microvessels with tissue TNF- α or TGF- β level, and a mildly positive correlation with tissue IL-5 or ECP concentration. **Conclusions:** This study demonstrated that angiogenesis may play an crucial role in CRS, and elucidated the close association of angiogenesis with endotyping and cytokines, may assisting to the therapy for CRS.

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INFLUENCE OF IL-33 GENE POLYMORPHISM ON FORMATION OF CLINICAL PHENOTYPES OF CHRONIC RINOSINUSITIS WITH NASAL POLYPS

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CRS – pathophysiology 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Background: Chronic rhinosinusitis with nasal polyps (CRSwNP) has various pathogenic mechanisms. Comparison of the clinical phenotypes of the disease with genetic mutations can expand the understanding of which immunological mechanism will be triggered in a particular patient. **Purpose:** to predict the development of certain clinical phenotypes in patients suffering from CRSwNP using genotyping. **Methods:** the study involved 103 patients with CRSwNP and a control group of 50 relatively healthy individuals who were examined for the presence of mutations in the single-nucleotide polymorphisms (SNP) rs3939286 and rs1342326 of the IL-33 gene. **Results:** Statistical analysis of the obtained data revealed that the A-allele of SNP rs3939286 is a genetic predictor of the development of CRSwNP OR=2.484 (95% CI, 1.184-5.212, p-value = 0.0235), and the heterozygous variant (GA) of rs3939286 is associated with the formation of chronic purulent inflammation of the mucous membrane of the nasal cavity and paranasal sinuses OR= 2.788 (95% CI, 1.068-7.276, p-value = 0.04848); the homozygous variant (AA) rs3939286 aggravates the course of CRSwNP and 4 times (p-value=0.0492) increases the risk of developing predominantly non-atopic asthma. The G allele rs1342326 also showed a statistically significant association with the development of asthma in patients with nasal polyps OR=3.048 (95% CI, 1.136-8.179, p-value=0.04574). **Conclusion:** SNP of rs3939286 and rs1342326 of the IL-33 gene have a prognostic role in the formation of certain phenotypes of CRSwNP.

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Association between smoking and chronic rhinosinusitis: a systematic review and meta-analysis

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CRS – pathophysiology 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Chronic rhinosinusitis (CRS) is a debilitating inflammatory disease of the paranasal sinuses. While cigarette smoking has known associations with lower respiratory tract diseases, the impact of smoking on CRS has not been clearly established. Objective: To clarify the association between first-hand cigarette smoking and the prevalence and prognosis of CRS, including quality of life (QOL), olfactory dysfunction, computed tomography (CT) and endoscopy scores, as well as outcomes following functional endoscopic sinus surgery (FESS). Data Sources: PubMed, Embase, SCOPUS, and Cochrane Library; from inception until 15 May 2022. Study Selection: Three blinded reviewers selected observational studies reporting the prevalence and prognosis of CRS in smokers, as compared to non-smokers. Data Extraction and Synthesis: Three reviewers extracted data, evaluated study bias using the Newcastle-Ottawa scale and Cochrane Risk of Bias tool, following PRISMA guidelines and a PROSPERO-registered protocol (CRD42022345585). We used random-effects meta-analyses to pool the prevalence of smoking in CRS and CRS in smoking, the association between active versus past smoking and CRS, and the association of smoking with QOL in CRS before and after FESS. We also performed descriptive analysis of olfactory function, CT scores and endoscopy scores in smokers versus non-smokers before and after FESS. Main Outcomes and Measures: Pooled prevalence, odds ratios (OR) and standardized mean differences. Results: Attachment



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FXa augments IL-8 and GM-CSF expression in nasal epithelial cells through PAR2

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CRS – pathophysiology 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Background: Fibrin deposition resulting from local activation and dysregulation of the coagulation cascade plays a vital role in the pathogenesis of chronic rhinosinusitis with nasal polyps (CRSwNP). The interaction between coagulation activation and local inflammation may promote each other, forming a vicious circle. **Objective:** To explore the effect of activated coagulation factor X (FXa) on nasal epithelial cells through protease activated receptor 2 (PAR2). **Methods:** FXa levels were determined by ELISA in nasal polyps (NP) and control tissue homogenates. The expression and localization of PAR2 in CRSwNP were evaluated through WB and immunohistochemistry. The effect of FXa on BEAS-2B and primary nasal epithelial cells from patients with CRSwNP was investigated. **Results:** The levels of FXa were significantly increased in NP from patients with CRSwNP compared with control tissue. The expression of PAR2 was significantly higher in NP vs. control tissue. Moreover, PAR2 was mainly localized in epithelial, glandular, and scattered tissue or inflammatory cells. FXa significantly increased the expression of IL-8, GM-CSF, and VEGFa in BEAS-2B cells, and IL-8, GM-CSF, but not VEGFa in primary nasal epithelial cells from patients with CRSwNP. PAR2 antagonist can inhibit the effect of FXa on BEAS-2B cells and primary nasal epithelial cells. **Conclusion:** FXa increases the expression of IL-8 and GM-CSF in nasal epithelial cells from patients with CRSwNP through PAR2. The coagulation activation and local inflammation promote each other in CRSwNP.

Smell and Taste 2

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Correlation of olfactory bulb volumes and COVID-19 associated olfactory dysfunction

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Smell and Taste 2 | Room 8 Hall 4 - Level 0 | Wednesday 21/06/2023

Introduction: One common symptom of COVID-19 infections is olfactory dysfunction. The presented study aimed at a verification of the hypothesis that COVID-19 associated olfactory dysfunction correlates to structural changes in the olfactory bulbs (OB). **Methods:** Data of 233 COVID-19 convalescents from the Hamburg City Health Study were analyzed. After recruitment, patients underwent MR imaging with an automated volumetry of the OB ("baseline" examination, 253.51 ± 84.46 days after COVID-19), as well as neuropsychological testing and an assessment of smell via Sniffin' Sticks (screening test) and standardized questionnaire in a "follow-up" examination (663.51 ± 109.74 days after COVID-19). OB volumes and clinical measures were statistically compared between participants with and without persistent smelling impairment. **Results:** COVID-19 convalescents with post-acute smelling impairment showed significantly lower OB volumes than those with perceived normal smelling (mean at baseline: 40.76 mm³ vs. 46.74 mm³, p=0.046; mean at follow-up: 40.45 mm³ vs. 46.55 mm³, p=0.036). OB volume successfully predicted olfactometric scores at follow-up (p=0.018). Performance in neuropsychological testing was not significantly associated with OB volumes. **Conclusion:** Our data shows a correlation between persistent olfactory dysfunction after COVID-19 and OB volumes. OB volumetry might be a surrogate marker for an objective evaluation of post-COVID olfactory function.

**1378****Does Uvulopalatopharyngoplasty****ALSHAIKH NADA¹, NADA ALSHAIKH¹**¹DEPARTMENT OF OTOLARYNGOLOGY HEAD & NECK SURGERY, MOUWASAT HOSPITAL, DAMMAM, SAUDI ARABIA

Smell and Taste 2 | Room 8 Hall 4 - Level 0 | Wednesday 21/06/2023

Background: UPPP is a surgical procedure that is aimed to reduce snoring and obstruction through elimination of redundant pharyngeal mucosal folds, obstructing tonsils, and excess soft palate. Alteration of taste has been documented as a potential complication since UPPP involves reduction of redundant palatal tissue which contains taste buds. However, potential effect of UPPP on olfaction has yet to be determined. The aim of this study is to investigate the effects of UPPP on olfaction and taste sensations. **Method:** A prospective clinical study was conducted in a tertiary Otolaryngology referral hospital in Singapore. Patients who underwent UPPP for OSA in the absence of any sinonasal diseases were invited to participate. Assessment of olfaction and taste was conducted pre-operatively and 1- and 12-weeks post-operatively using 10-point Visual Analogue Scale (VAS), Sniffin' Sticks extended test battery, and four basic tastes sprays. **Results:** 15 patients enrolled in the study (1 woman, 14 men; mean age 62 years). Nine patients (60%) had abnormally low smell scores pre-operatively while the rest have normal scores. Six patients (40%) showed improvement in olfaction at one- and 12-weeks after surgery, 4 (26.7%) had decreased smell score at both visits after surgery, and 5 (33.3%) defaulted from last follow up visit although 3 of them (60%) showed improved smell scores. **Conclusion:** This pilot study showed no significant effect of UPPP on olfaction. However, changes in smell scores have been detected in some patients. Further studies are recommended.



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Olfactory loss associated with SARS-CoV-2 and other respiratory viruses: A multicenter prospective cohort

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Background: Although the COVID-19 pandemic has increased the prevalence of cases with olfactory loss, other respiratory viruses can also cause this condition. We aimed to compare the prevalence of acute SARS-CoV-2 infection and other respiratory viruses in patients with sudden smell loss, and to assess the impact of SARS-CoV-2 viral load and co-infection on olfactory symptoms. **Methods:** Patients with sudden smell loss were recruited in a multicenter prospective cohort study in 15 hospitals in Brazil. Clinical questionnaire, Connecticut Chemosensory Clinical Research Center (CCCRC) olfactory test and nasopharyngeal swab to perform a PCR-based respiratory viral panel were collected at first visit (day 0) and after 30 and 60 days. **Results:** 188 of 213 patients presented positive test result for SARS-CoV-2, among which 65 were co-infected with other respiratory viruses (e.g. rhinovirus, enterovirus, and parainfluenza). Patients with SARS-CoV-2 and non-SARS-CoV-2 had a mean corresponding to anosmia (<2 points) at day 0 in the psychophysical olfactory test CCCRC, with no significant difference between them (-0.55; -1.18 to 0.07; p=0.08). Both groups had significant smell scores improvement after 30 and 60 days, with no difference between them. Co-infection with other respiratory viruses and SARS-CoV-2 viral load did not impact olfactory scores.

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Regrowth of olfactory sensory neurons in acquired anosmia (REGROLF)

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Anosmia is a frequent condition that can be caused by traumatic brain injury and subsequent shearing of olfactory axons traversing the skull base. There is currently no primary cure for this debilitating and often permanent condition. We intend to create a biodegradable scaffold to be implanted in the cribriform plate to promote olfactory axonal regrowth. The aim of this study, is to analyze the microenvironment (growth factors, extracellular matrices) that enhances axonal regrowth in mice. We harvested olfactory epithelium of C57BL/6 mice and cultured them during 15 days on coverslips coated with various proteins (Fibronectine, Collagen IV, Laminin, none) and different growth factors (FGF2, BDNF, GDNF, NGF, Retinoic Acid, TGF- β). We measured the attachment rate on the coverslips, presence of axonal outgrowth, and finally the total axonal length with a newly developed automated high-throughput quantification tool. Our results showed that this quantification tool took only 3 minutes to effectively quantify axonal length instead of 22 minutes in average, when a manual tracing using standard application (Neuron J) was used. Neuronal outgrowth and total axonal length was better enhanced with Fibronectin and Collagen IV ($p=0.001$) and growth factors with the following sequence: FGF2 from 0 to 7 days, and FGF2 with NGF from 8 to 15 days of culture ($p<0.0001$). In conclusion, this method allowed for a rapid screen of conditions that enhances regrowth of olfactory sensory neurons. These data will be used to further the development of a biodegradable olfactory implant.

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Does repeated surgery have an influence on intranasal trigeminal function ?

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Introduction Treatment-refractory, chronic nasal obstruction is frequent. It is characterized by failure of standard medical treatment. Endoscopic examination shows either a clear anatomic deformity which is mostly solved by surgery or is ambiguous with no major anatomic explanation for the complaint. The latter group of patients are a clinical challenge since surgery not necessarily leads to successful outcome. It has been hypothesized that such paradoxical nasal obstruction may be due to low intranasal trigeminal function and thus airflow perception. **Methods** We included 314 patients complaining of chronic nasal obstruction. The common feature they shared was that the endoscopic examination did not clearly showed an anatomical deformity that would explain the complaint. One hundred eleven patient did never had any nasal surgery whereas the remaining ones had one, two or more previous nasal surgeries. All patients underwent intranasal trigeminal function testing, rhinomanometry and PINF testing. **Results** Compared to normal values established for the trigeminal intranasal function according to the literature, all included patients showed lower mean intranasal trigeminal function. There was no difference in intranasal trigeminal function between patients without, after one, or after 2 and more intranasal surgical procedures. **Conclusion** The results suggest that the number of intranasal surgeries does not have a major effect on intranasal trigeminal function.

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Can MRI predict olfactory loss and improvement in post-traumatic olfactory dysfunction?

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Objective markers of smell function and prognostic factors are lacking for post-traumatic smell loss. The aims of our study were to carefully classify the extent of post-traumatic neurodegeneration, to determine its relationship with chemosensory dysfunction and to establish whether MRI evaluation can predict olfactory improvement. We conducted a retrospective study based on a consecutive series of 56 patients with post-traumatic olfactory dysfunction. All patients underwent tests of their smell, taste, and trigeminal functions, ENT evaluation, and MRI. A radiologist blinded to patient data evaluated 40 chemosensory-relevant brain regions according to a four-point scale (0=no lesion to 3=large lesion). Data on follow-up visits were available in 46 patients (mean follow-up = 47 months). The results showed four brain lesion clusters associated with the olfactory dysfunction categories: anosmia, hyposmia and normosmia ($\chi^2(6, n=56) = 15.5, p=0.015$). Two clusters with the largest lesions were highly specific for anosmia (100% specificity) and could accurately predict this condition (100% positive predictive value). Regarding improvement, 72.7% of patients in the cluster with mild lesions experienced subjective and measurable olfactory improvement. This was only the case in 21.7-37.5% of patients with larger lesion clusters. The odds of subjective smell improvement were 5.9 times higher in patients within the milder cluster compared to larger ones. In conclusion, clusters of brain lesion patterns predicts anosmia and measurable smell improvement.



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Follow up results of the Covid-19 anosmia clinic - our experiences with smell retraining

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The aims were to characterise demographics of patients presenting with persistent loss or alteration of smell and taste following Covid-19 infection. The primary aim was to assess change in formal smell test scores (UPSIT) and quality of life questionnaires following interventions such as smell training & advice given in a specialist Smell clinic. The smell clinic was set up based on ENT UK & BRS guidelines. Patients were asked to complete an 'UPSIT' test and eODQ questionnaire. Patients were then advised to undertake smell retraining for 4 to 6 months. We completed a retrospective analysis of patients who had attended for Smell clinic follow up. This allowed analysis of patients' presentations to identify patterns in patients who are more likely to suffer long term olfactory dysfunction following Covid-19 infection. Our primary aims were assessed via repeat UPSIT scores and eODQ scores to assess for any improvement. Initial data showed patient's presenting with anosmia in 35%, 40% with parosmia and 25% had taste disturbances. The UPSIT score ranged between 22-34 and the eODQ score ranged between 42-151. Post smell retraining results suggest an improvement in their UPSIT scores and eODQ scores. 83 % of patients followed up were female. 94% completed smell training for a minimum of 2 months. 55% of patients showed an improvement in their UPSIT scores on retesting of 1-3 points. All patients were keen to continue smell training. Our data analysis shows promising results from use of smell training for treatment of COVID-19 related smell disorders.

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SMELL-RS: a universal and digital olfactory test

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Available smell tests can be time consuming and require trained healthcare providers to administer them. Their scores are often affected by patient's cultural and genetic background. Because of these issues, many clinical settings (e.g. private practice) and many countries do not have access to a validated smell test. To overcome these issues, we developed a smell sensitivity (SMELL-S) and resolution test (SMELL-R) that are non-semantic and made of unfamiliar odor-mixtures. They overcome the cultural and genetic biases as previously shown. We recently adapted SMELL-RS into a practical, self-administered and digital format. The aim of this study was to analyze its reliability, accuracy and administration time. We recruited 100 subjects of various cultural background and smell disorders at a tertiary smell and taste clinic. The outcome measures was SMELL-RS test scores, Sniffin' Sticks battery test scores, administration time, smell loss etiologies, and demographics. They came for a test and retest visit scheduled one week apart. We found that SMELL-RS scores had high test-retest reliability, accurately discriminated patients with different degrees of olfactory function, and correlated with Sniffin' Sticks TDI test scores. The time needed to complete SMELL-RS was on average 16 minutes (16 SD) compared to the standard test, which took 30 minutes (10 SD) ($p < 0.001$). In conclusion, SMELL-RS is reliable, accurate, and was less time consuming compared to the Sniffin' Sticks. We hope to create a practical and accessible smell test that is applicable worldwide.



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Analysis of smell status after COVID-19 infection in patients classified according to World Health Organization guidelines.

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Introduction: Olfactory loss is a frequent symptom of COVID-19. Clinical evolution varies between patients, being classified by the World Health Organization (WHO). The relationship between loss and recovery of olfaction according to the severity of the case is not yet well established. Objective: to evaluate relationships between olfactory loss and severity of COVID-19. Methods: SARS-CoV-2 infected patients for more than 3 months were invited to participate. General data, questionnaires, olfactory assessment (Connecticut test) and taste test (solutions by Vaira et al) were collected. Data were analyzed by dividing patients according to the criteria recommended by WHO. Results: 187 patients were analyzed; mean age of 49.4 ± 11.8 years. 94 patients (50.3%) reported olfactory loss during the acute condition. 57 (60.6%) had a non-severe condition, 24 (25.5%) had a severe condition, and 13 (13.8%) had a critical condition (p

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Chronic Post-viral Olfactory Dysfunction Diagnosis and Management

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Background: Chronic post-viral olfactory dysfunction became viral during the Covid-19 pandemic. **Objective:** To objectively assess chronic post-viral olfactory dysfunction and the effectiveness of combined orthonasal olfactory training and nasal protocol treatment. **Method:** A quasi-experimental of 12 subjects with chronic post-viral olfactory dysfunction was included and assessed for olfactory function using the alcohol sniff test (AST), the intravenous olfactory test (IOT), and the Sniffin Stick Test (SST), and underwent a combined treatment of orthonasal olfactory training and a nasal therapy protocol for 6 weeks. **Results:** There were 8 subjects with hyposmia and 4 subjects with anosmia. In the hyposmic group, there were 2 phantosmia and 2 parosmia subjects, while 1 subject of phantosmia occurred in the anosmic group. The types of post-viral olfactory disorders in this study were 9 sensorineural subjects and 3 conductive subjects. At the initial measurement, the AST measurement value was 7.1 (1.5-19.5), with delayed onset of IOT 22 (14-55), and decreased duration of IOT 45 (11-150). The results of SST consist of a threshold was 6.4 (1.5-12.5), discrimination 7.5 (3-13), identification 9.5 (5-14), and TDI 23.8 (12.6-29.6). Statistical calculations of olfactory function after therapy were found to be significant based on AST, the onset of IOT, duration of IOT, discrimination, identification, and TDI ($p < 0.05$). **Conclusion:** The combination of orthonasal olfactory training and nasal therapy protocol for 6 weeks has been shown to be effective in improving olfactory function



Rhinoplasty 1

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VALIDATION OF THE EUROPEAN PORTUGUESE LANGUAGE VERSION OF THE STANDARDIZED COSMESIS AND HEALTH NASAL OUTCOMES SURVEY

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Introduction: The Standardized Cosmesis and Health Nasal Outcomes Survey (SCHNOS) questionnaire is a tool developed to evaluate functional and aesthetic components of rhinoplasty. It is a reliable patient-reported outcome measure, not available in the European Portuguese language. **Objective:** our goal was to translate and culturally adapt the SCHNOS questionnaire to the European Portuguese language. **Methods:** The questionnaire was forward and backward translated and culturally adapted to the European Portuguese language following international guidelines. The authors evaluated internal consistency, correlation, and reproducibility to determine the validity of the questionnaire. **Results:** The final European Portuguese version of the SCHNOS was administered to 58 native European Portuguese speakers. Both the SCHNOS-O (obstructive) and SCHNOS-C (cosmetic) showed high internal consistency with Cronbach's alpha of 0.93 and 0.95, respectively. Also, for the entire SCHNOS, Cronbach's alpha was 0.96. All the items demonstrated good item-test and item-rest correlations with the differences between pre-and post-estimates being non-significant. **Conclusions:** The translation, adaption, and validation of the SCHNOS into European Portuguese was successfully performed. This provides another tool to help evaluate the functional and aesthetic outcomes of rhinoplasty patients.



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Navigated osteotomies in rhinoplasty, a cadaver study

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Background: To perform osteotomies during rhinoplasties requires a lot of skills and long term experience. Chisels and osteotomes are often used in a semi-blind way due to the thick envelope of the nasal soft tissue and skin. In selected cases, i.e. in post-traumatic nasal deformities, concise refracturing of old fracture lines would be desirable. It was the aim of this study to investigate the accuracy of CT-navigation guided osteotomies.

Methods: Ten cadaveric heads were used to perform electromagnetic Cone-Beam-CT (CB-CT) navigated transnasal and transcutaneous osteotomies, where the naso-maxillary suture line was tried to be followed. Postinterventional CB-CTs were compared to preinterventional imaging and the distance between the true naso-maxillary suture and the osteotomies were measured. Heads were then dissected to expose the bony pyramid of the nose and to measure the mean distance between the two lines.

Results: The mean distance between the osteotomy and the suture line was 1.4mm on both sides, varying between 0.3mm and 3.7mm. There was a relevant intra- and interindividual variance.

Conclusion: CB-CT navigated transnasal and transcutaneous osteotomies achieved a fair accuracy in this cadaveric model. The suture lines could not be followed perfectly. Therefore, it is questionable if this technique could re-fracture old fracture-lines with adequate accuracy without additional landmarks. Real-life evaluation, however, is yet to be accomplished.

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The « scroll swing flap », a novel technique for mid-nose derangements.

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BACKGROUND Pinching of the caudal cartilaginous vault or regional depressions of the lateral alar/supra-alar wall are rather common deformities observed in patients seeking rhinoplasty. The aim of this study is to present the « scroll swing flap », i.e. a soft-tissues/cartilage composite flap sculpted via a transcartilaginous approach (via intracartilaginous incision), rotated cranially (medial pivot point) or supero-laterally (lateral pivot point) to correct, the caudal pinching of the midnose or regional depressions of the alar/supra-alar wall. **METHODS** During the past 3 years, the composite scroll swing flap was used in 27 patients undergoing rhinoplasty to correct monolateral (16 cases) or bilateral (5) caudal pinching of the midnose. In 6 patients the technique to correct monolateral (5 cases) or bilateral (1 case) regional depressions of the "empty triangle". Further cosmetic improvement was achieved by using small onlay cartilaginous graft in targeted areas around the flap. In revision cases, mature scar tissue was used as onlay graft when available. **RESULTS** Results were evaluated by pre- and post-op standard photos. In all the cases presenting with the classical "hour-glass" configuration, the deformity was improved and more aesthetically "brow-dome lines" resulted as a conjoined result of the concomitant reduction of the tip volume. In the long term controls, no evident resorption of the transferred tissues was observed. **CONCLUSIONS** The scroll wing flap technique can be considered a useful and reliable technique to correct midnose pinching and deformity of the empty triangle



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Nasal reconstruction using both cranial bone and ear cartilage

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Rhinoplasty 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

Since 1996, more than 100 patients have been operated on for dorsal nasal augmentation. In this study, an anatomic reconstruction is described using cranial bone graft for the bony part of the nose while reconstructing the cartilaginous part with ear cartilage. This modification provides protection of the nose from the traumatic forces creating a flexible nasal tip. A modification is described and compared with the nasal reconstruction by calvarial bone itself. The cranial bone and ear cartilage have been used for dorsal nasal augmentation on the nasal reconstruction cases with high rates of satisfaction. According to the 26 years follow-up, the technique is durable and useful for nasal augmentation. In this study, the technique and long term results will be presented.



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Changing Practices in Septorhinoplasty: the Irish Experience

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Rhinoplasty 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

BackgroundSeptorhinoplasty(SR) is one of the most complex surgical procedures of the head and neck. As an elective procedure aiming to enhance patient quality of life, it can be difficult to perform in single-payer healthcare systems due to capacity pressures from acute/oncological surgical demand. We aimed to review national trends in the practice of SR to inform future healthcare planning. **Methods**This was a cross-sectional, population-based, longitudinal study of SR cases in Ireland's single-payer(public) healthcare system from 2005-2021. Time-series analysis using a linear regression model was performed to analyse trends by operation type, revision rates and length of stay. The impact of the Covid-19 pandemic and national surgical guidelines were analysed and compared. **Results**1952 SR were performed. Annual mean cases declined in both real($R=0.76, p<0.01$) and relative($R=0.87, p<0.01$) terms by 31% and 43% respectively. Daycase rhinoplasty, while initially rarely performed, increased to account for 55% of cases performed. The mean hospital length of stay declined significantly($R=0.85, p<0.01$) by 44%. **Conclusions** SR increasingly struggles to find its' place in Ireland's public healthcare system. New changes in SR practices including the rapid growth of daycase surgery and shorter lengths of hospital stay are positive developments in response to increased healthcare system pressures.



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Revision rhinoplasty: do we get the right perspective?

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Introduction: Every patient undergoing rhinoplasty should be informed about possibility of need for revision. According to literature, revision rate varies between 5 and 15%. Planned two-stage rhinoplasties are rare, so secondary rhinoplasty usually indicates the failure of the primary one. **Patients and methods:** We analyzed the data of operated rhinoplasty patients in last 2 years, and the recent literature related to frequency and causes for revision rhinoplasty. **Results:** There is increasing number of revisions among total number of rhinoplasties. The reasons for revisions are functional and esthetic, which is according to the literature. **Conclusions:** Regardless of the causes for revision, the increasing rate of secondary rhinoplasty is a negative trend. We believe that there is a need for improvement in indicating surgery, as well as in informing the patients regarding their expectations, which could altogether decrease the need for revisions.



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The Importance of the Nasal Tip in Correction of the Deviated Nose

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Rhinoplasty 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

Background: Establishing stable and long-term results in the correction of the deviated nose has been a nightmare even for experienced surgeons. Most patients have problems both in form and function. Analyzing the underlying anatomy in each case is important to establish the plan of treatment that differs in every case. Methods: Six hundred seventy selected deviated nose patients underwent different surgical procedures for correction of the deviated nose. More than three fourth of patients had a combination of more than four procedures to correct various aspects of deviation from radix to the tip. All types of deviated noses were operated in one stage with the correction of the pyramid and septum. Proper cuts and resections of cartilage and insertion of resected materials as different types of grafts were the basis of most techniques for correction. Results: Correction of form and function included restoration of the straight dorsum, reducing asymmetries and providing a functionally patent nasal valve. There was an improvement in breathing and appearance of the nose with varying degrees in our cases. Improvement was more noticeable in patients with multiple procedures to correct the entire framework from the radix to the tip. Conclusions: The deviated nose is a complex deformity extending from the radix to the tip. Successful surgery is not possible without the correction of tip deformities and asymmetries as an important part of the procedure.



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The Autologous Nasal Fibro-fat in Rhinoplasty: A New Graft Option

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Rhinoplasty 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

Background: Various grafting materials have been described for augmentation in rhinoplasty. These materials have potential problems such as visibilities and irregularities, unwanted reactions and inflammations and considerable resorption. The increased operation time for harvesting and donor site morbidities were other reasons which persuaded us to use intrinsic nasal fat as a graft material for different steps of rhinoplasty. Methods: Forty nine patients underwent open and closed approaches for primary rhinoplasty. After elevating the skin flap in a supraperichondrial plane, the lower lateral cartilages and cartilaginous dorsum were exposed. The fibro-fatty tissue over the lateral crura and between the medial crura was harvested with sharp scissors. Spreading that fibrofat tissue and use it like a fascia camouflages dorsal irregularities. Fibro-fat grafts are fixed in the radix area with suture. The size is adjusted to compensate for slight absorption over time. In all techniques, the fibrofat tissue is inserted in direct contact with the overlying skin. Results: The patients were followed up to four years after surgery. No complications have been noted with this type of graft. Minor resorption was observed in two cases. Conclusions: The nasal fibro-fat graft is a suitable and easy harvested graft material with no morbidity for augmentation of the nasal profile. It could fit the place with no visibility problem. It camouflages the irregularities, contour deformities, or asymmetries of the nose as an alternative to more common grafting techniques.



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Functional and Aesthetic Correction of the Primary Alar Concavity

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Rhinoplasty 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

Introduction: Extreme concavities of the lower lateral crura can cause severe aesthetic and functional problems. Lateral crural reversing can contour the shape, reconstruct lateral crus completely and correct concavity and valve collapse by a simple technique. It could be done with or without reinforcing grafts. **Methods:** This retrospective study was directed on thirty-three primary rhinoplasty patients. After transcolumellar and marginal incisions, the skin flap was elevated in a suprapraperichondrial plane, exposing the lower lateral cartilages and cartilaginous dorsum. Then the mucosa was detached from the posterior surface of the lower lateral crura. The cartilages were released, excised, reversed and fixed in place. Different lateral crural grafts were used in some of the patients. **Results:** All patients were improved in form and function. There was no difference in the patient with the use of grafts or without them. Postoperative swelling was slightly longer in our patients. However, there were no complications and all patients were satisfied with the long-term aesthetic and functional results. **Conclusion:** With the lower lateral crural reverse plasty, severe concavities of the lower lateral crura can be corrected. This technique is a useful and reproducible procedure, performed without additional tissue to achieve functionally and aesthetically satisfying and enduring results.



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Postoperative malodorous smell in open septorhinoplasty: the effect of intradomal suturing with mucosal release

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Purpose: The aim of this study was to test a mucosal release method for decreasing the occurrence of malodourous smells after septorhinoplasty by preventing formation of debris pockets after surgery. **Methods:** This study included 50 adult patients from 18 to 45 years of age who underwent open septorhinoplasty from January to May 2019. Patients were divided into two groups. The first group had intradomal (transdomal) sutures without submucosal release, while the second group had mucosal release. All patients had scheduled post-op visits at 1, 2, 4, and 8 weeks and 6 months. **Results:** The overall postoperative rate of malodorous smell in both mucosal release and non-mucosal release patients at 2 weeks, 8 weeks and 6 months was 43.1%, 31.4% and 5.9%, respectively. Patients 36-45 years of age had a higher rate of postoperative malodorous smell with 55.6% at 2 weeks, decreasing to 33.3% at 8 weeks, and to less than 1% at 6 months. At 2 weeks after surgery, only 20% of the mucosal release group reported a malodorous smell compared to 65.4% in the non-mucosal release group. The rate was 8% at 8 weeks, and less than 1% at 6 months in the mucosal release group compared to 53.8% at 8 weeks and 11.5% at 6 months in the non-mucosal release group. **Conclusions:** Utilizing absorbable polydioxanone sutures and releasing the vestibular mucosa of the LLC significantly reduced the rate of postoperative malodorous smell for septorhinoplasty patients with intradomal (transdomal) single-dome suturing.

Orbital surgery/ Lacrimal Surgery

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Endoscopic Dacryocystorhinostomy without Mucosal flap preservation. A seven years retrospective results from Chania General Hospital, ENT Dept.

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Orbital surgery/ Lacrimal Surgery | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Objective: Assessment of seven years anatomical and functional outcomes of primary powered endoscopic dacryocystorhinostomy (DCR) without mucosal flap preservation. Remains the debate on whether to use or not mucosal flap, after endoscopic powered DCR. **Methods:** The purpose of the present study is a retrospective review of patients with epiphora secondary to acquired nasolacrimal duct obstruction who underwent primary powered endoscopic DCR performed over a 7-years period from 2010 to 2022 without mucosal flaps preservation. Assessment of the long-term anatomical and functional outcomes was performed. Main outcome measures were subjective improvement in epiphora and assessment of anatomic patency based on lacrimal irrigation and endoscopic evaluation. **Results:** Forty-two patients all primary cases totaling 49 procedures, 35 unilateral and seven bilateral underwent analysis. All patients presented with epiphora. The mean follow up was 12.8 months (range: 6–36 months). The mean age at surgery was 67.8 years (range 54–81 years). Intraoperative complications were not recorded. At the final follow up 43 of 49, 87.8% had absolute resolution of epiphora and 4, 7.1% had partial resolution with mild epiphora? Anatomic success was achieved in (47 of 49) 95.9%. **Conclusion:** Powered Endoscopic DCR ensures excellent results comparable to those in recent literature. According to our study mucosal flap preservation does not present as a necessary condition for achieving and maintaining this result.

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Endoscopic and external dacryocystorhinostomy: long term results from a tertiary center in Portugal

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Orbital surgery/ Lacrimal Surgery | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Introduction: Dacryocystorhinostomy is the gold-standard for distal lacrimal obstructions. This study aims to report the demography, clinical presentation, influence of agger nasi opening, uncinectomy and septoplasty, complications and success of endoscopic and external dacryocystorhinostomy over a period of 11 years. **Methods:** Retrospective review of clinical records, from January 2012 to December 2022, at a tertiary center in Portugal. **Results:** A total of 249 procedures, 6 external and 243 endoscopic, were performed, including 39 revision cases. There was a female predominance (79.9%) with a mean age at diagnosis of 66.4 years. Recurrent acute dacryocystitis, reported by 33.3%, was associated with higher success ($p=0.053$). Agger nasi opening, uncinectomy and septoplasty were performed in 17.7, 6.0 and 15.3%, respectively, but although associated with higher success rates, no statistically significant result was found. Minor complication rate for both external and endoscopic approach was 33.3% and 32.1% respectively. Functional and anatomical success was 100% and 83.3%, respectively, for external dacryocystorhinostomy, and 91.4% and 85.1%, respectively, for endoscopic dacryocystorhinostomy. Revision surgery was associated with a worse anatomical success ($p=0.05$). **Conclusions:** Endoscopic dacryocystorhinostomy is an effective and safe alternative to external approach. Minor procedures can increase the success rate, but multicentre studies need to be performed for a statistically significant result.

1454

Current developments in the diagnostic and therapeutic process of tear duct obstruction with a view to the future

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Background: Dacryostenosis is the most common pathology of the tear ducts and typically manifests with epiphora. To date, dacryocystorhinostomy (DCR) is the most widely used method for the treatment of nasolacrimal duct obstruction (NLDO), with a success rate of about 90%. If the narrowing depends on an obstruction at the level of the Hasner valve, an alternative surgical strategy is endoscopic Hasner valvulotomy. **Methods:** Monocentric retrospective study on 281 cases of DCR (2004-2022) and 10 cases on endoscopic valvulotomy (2018-2022). A statistical analysis was carried out to identify any factors that could influence the short and long-term outcome of treatment. **Results:** After a median follow-up of 21 months following DCR, the anatomical result was achieved in 87.2% of cases and the functional result in 82.7%. Surgical failure requiring revision surgery was observed in 12.8% of cases. The only factors statistically linked to a reduction in failure rates were the use of peristomal mucosal flaps and the use of lacrimal stents. After a median follow-up of 12 months following valvulotomy, anatomical success was 75% and functional success was 67%. In 25% of cases, surgical failure required DCR. **Conclusions:** The validity of the treatment of distal dacryostenosis by endonasal endoscopic surgical approach has been confirmed. The application of an appropriate diagnostic-therapeutic approach and regular follow-up is essential to reduce the failure rate. In the case of very distal NLDO, endoscopic valvulotomy is showing promising results for the future.

1709

Lacrimal System Complex Congenital Anomaly: Conjunctivodacryorhinostomy with Stoploss Lester Jones Tube

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Orbital surgery/ Lacrimal Surgery | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

IntroductionOne of the main indications for performing a conjunctivodacryocystorhinostomy (CDCR) is chronic epiphora caused by an obstruction of the upper lacrimal tract due to specific anatomical anomalies that contraindicate a conventional dacryocystorhinostomy (DCR). Creating a new pathway between the conjunctiva and the nasal cavity and placing a permanent tube is highly effective allows the epiphora to resolve. **Objective**To describe a rare case of a complex congenital anomaly and its treatment with a CDCR. **Case Report**A 26-year-old male presented to an ENT clinic with right congenital epiphora. There were neither other ophthalmological symptoms neither history of acute dacryocistitis or ocular diseases. The complete ophthalmologic evaluation was unremarkable, besides absence of superior lacrimal puncto. Dacryoscystography showed a complete obstruction of the inferior lacrimal canaliculus. On CT scan, lacrimal fossa and nasolacrimal canal were empty. The patient was submitted to a CDCR with the insertion of a stoploss Lester Jones tube. Intraoperatively, the absence of lacrimal sac was confirmed. Six months after surgery, the tube was completely obstructed by conjunctival proliferation. The patient went under a CDCR revision, where the conjunctiva was resected, mitomycin C was applied and a longer tube was placed. **Conclusion**Multiple congenital anomalies of lacrimal apparatus can coexist to cause epiphora by multilevel congenital anomalies. The first-line treatment should consist in a CDCR with insertion of a Lester Jones tube that is a simple and effective procedure.



1759

OUTCOMES OF ENDONASAL DACRYOCYSTORHINOSTOMY: RETROSPECTIVE ANALYSIS

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Aims: Endonasal dacryocystorhinostomy (EN-DCR) has been widely used to treat nasolacrimal duct obstruction in patients with epiphora. The purpose of this study is to evaluate long term outcomes of the EN-DCR (primary and revision). **Methods:** Retrospective review of the clinical records of patients who underwent EN-DCR at our center, performed by a single surgical team (one Otolaryngologist and one Oculoplastic Surgeon), between May 2020 and May 2022. Only patients with minimum follow-up of 6 months were included. Nasal endoscopic evaluation was performed during follow-up and anatomical and functional success evaluated. **Results:** A total of 92 patients (124 EN-DCR) was included: 102 primary and 22 revision EN-DCR were performed. An overall success rate of 91.1% was obtained. In the primary group success rate was 94,1% % compared to 77,3% in the revision group (p-value = 0,011). Septoplasty was performed in 91,9% of cases and Mitomycin C was applied in 38,7% (revision surgery or purulent discharge), both with no statistical significance in the success rate. The rate of unexpected admissions to the emergency room in the first 30 days was 9,7%. **Conclusions:** Our data suggests that EN-DCR and concomitant septoplasty is a safe and effective procedure. Septoplasty and intraoperative mitomycin C did not improve patient outcome and revision EN-DCR was associated with a worse outcome in our study.



1222

Management of the orbit during endoscopic sinonasal tumor surgery – an update with survival data for a consecutive series of 32 patients

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Background: The aim of our study is to report intraoperative management of the orbit during endoscopic resection of benign and malignant sinonasal pathologies and subsequent postoperative results. **Methodology:** A total of thirty-two patients met the main inclusion criteria –endoscopic resection should incorporate at least one subsite of the orbital interface. All patients underwent surgery at University Hospital "Queen Jovanna-ISUL", Medical University - Sofia, Bulgaria during the period 2018-2022 - single surgeon consecutive series. **Results:** Malignancies (43.75%) and inverted papilloma (40.63%) comprise the majority of the cases. Most commonly surgical resection included lamina papyracea (90.6%), the inferomedial orbital strut (46.8%) and floor of the orbit (21.8%). Diplopia (37.5%) and exophthalmos (40.6%) were the most common preoperative ophthalmologic symptoms, which significantly improved after the surgical resection ($\chi^2(1) = 0.846, p=0.000$). 59.3% of the patients underwent larger resections of the orbital bony interface (two or more anatomical subsites). We report a recurrence free survival rate of 72.7% for the malignancy cases in the group with an average follow-up period of 23 months. **Conclusions:** Overall our data suggests that even larger resections of the orbital bony framework could be managed by a purely endoscopic approach with low complication and recurrence rates.

**1266****Endoscopic Optic Nerve Decompression****Hussam ElBosraty¹**

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Orbital surgery/ Lacrimal Surgery | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Endoscopic optic nerve decompression (EOND) is currently the treatment of choice for traumatic optic neuropathy (TON). Familiarity with anatomical landmarks and optic nerve decompression are important determinants of safe and effective surgeries. Having a firm understanding of the anatomical structures of the optic nerve region and obtaining an anatomical image of the patient prior to the surgery could critically facilitate optic nerve decompression and reduce surgical risk. Other indications include skull base tumors e.g., meningiomas growing into the optic canal. or fibro-osseous lesions of the skull base. Endoscopic optic nerve decompression is most suited to pathology located medial to the optic nerve. In this study we demonstrate our experience about Endoscopic optic nerve decompression in 7 cases with variable etiologies and showing the value of the powered instrumentation to achieve the best outcome.

1599

Quality of life assessment after endoscopic orbital decompression for Graves orbitopathy

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INTRODUCTION: Graves orbitopathy (GO) is a sight- threatening autoimmune process. In severe cases, an orbital decompression may be indicated. Our aims were: (1) to determine if purely endoscopic orbital decompression (EOD) improves health- related quality of life (QoL), (2) to determine the proptosis reduction (PR) after EOD and (3) to determine if QoL improvement is related with PR. **MATERIAL & METHODS:** A 3- year prospective study was conducted. Patients with severe GO and indication for EOD were included. We evaluated QoL (GO-QoL questionnaire) and proptosis (Hertel exophthalmometer) preoperatively and 12 months after surgery. **RESULTS:** Twenty patients were included. 12 months after surgery the GO-QoL showed a mean improvement of visual performance (2.87 points, 11.2%) and physical appearance (5.75 points, 22.57%). The exophthalmometer showed an average 3.7-millimetre PR. In cases with >-millimetre PR, there was a correlation with QoL improvement (physical appearance parameters). **DISCUSSION AND CONCLUSIONS:** To measure EOD outcomes, objective clinical parameters are assessed. Nonetheless, to improve QoL is the primary aim. Then, the subjective perception of health- related QoL is key to understand surgical outcomes. We observed an overall improvement of objective and subjective parameters. Additionally, both seem correlated when PR exceeds 5 millimetres.

1612

Endoscopic Endonasal Intraorbital Surgery: 360°anatomy and illustrative cases

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Objectives To identify the anatomic landmarks of endoscopic endonasal intraorbital approach, and to present six illustrative cases. **Methods** In anatomy research section, four silicon-injected adult cadaveric heads (8 sides) were dissected, using the endoscopic surgical instruments to perform the endoscopic endonasal intraorbital approach and the Karl Storz Image 1S system to record the entire process. In clinical application section, we report five cases with intraorbital diseases underwent an endoscopic endonasal intraorbital approach. **Results** With the optic nerve as the center, establishing the horizontal and vertical coordinate axes, the intraorbital anatomy was divided into four quadrants, namely, superior medial, inferior medial, superior lateral and inferior lateral quadrants. In the sagittal plane, dissection was performed from the orbital apex, orbital nerve, to the globe; in the coronal plane, dissection was performed from the medial wall to the central optic nerve, superior, lateral and inferior walls of the orbit. Taking the optic nerve as the center and dissection was performed layer by layer, including adipose tissue, vascular nerves and muscles. Surgical dissection was able to access not only the medial superior and medial inferior quadrants, but also the lateral superior and lateral inferior quadrants. Important landmarks, such as the medial orbital wall, part of the inferior orbital floor, periorbital in the deep layer, and intraorbital fat in the superficial layer could be identified using this approach. Furthermore, medial rectus muscle, superior oblique muscle and inferior rectus muscle could also be recognized. Following dissecting the space between the medial rectus muscle and the inferior rectus muscle, the intraconal space could be accessed. After removing the intraconal fat, important vessels and nerves were identified, including the ophthalmic artery and its inferior medial muscular trunk, the optic nerve, and the branches of oculomotor nerve. Five cases were presented including 2 cavernous hemangioma, 1 metallic intraorbital intraconal foreign body, 1 invasive mucormycosis, 1 lymphoma. Endoscopic endonasal transorbital approaches were successfully performed, and the aims of the operation were all achieved. Patients recovered well, and no major postoperative complications occurred. **Conclusions** An understanding of the landmarks of the intraorbital structures is paramount for surgically dealing with diseases located within or adjacent to this region. The endoscopic endonasal intraorbital approach is safe, effective and minimally invasive for appropriately selected cases.



1617

Surgery of sight-threatening Graves' orbitopathy

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Orbital surgery/ Lacrimal Surgery | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Background: The orbit is a multidisciplinary surgical field. Due to this fact, we have an orbital-team in our university since 2018. Methodology/Principal: We would like to present our surgical cases, operated with sight-threatening Graves' orbitopathy (GO) between 2018-2023. The two main indications for surgery were dysthyroid optic neuropathy (DON) and corneal breakdown. All DON patients received high-dose methylprednisolon therapy first, in our center according to the European Group on Graves' orbitopathy (EUGOGO) clinical practice guidelines. Patients with corneal breakdown underwent urgent surgery. Results: We have operated 30 balanced orbital decompressions in 19 patients. The postoperative improvement in visual acuity was significant compared to the preoperative one and stayed stable in most patient. The medial orbital decompressions were done by the transnasal endoscopic way, the lateral wall decompressions via lateral orbitotomy. Conclusions: However the orbit is a relatively small anatomical space, we think, multidisciplinary is the only way to treat it's pathologies.

1649

Orbital implantation surgery for correction of delayed enophthalmos

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Purpose: Enophthalmos is posterior displacement of the globe within the orbit caused by several etiologies. The correction of enophthalmos involves not only reducing the bony orbital expansion, but also increasing the orbital tissue volume. For delayed correction of enophthalmos, orbital volume measurement and the visual axis should be considered a major part of enophthalmos treatment. Various surgical options and implant materials for orbital volume augmentation have been reported, but no consensus has yet been reached regarding appropriate surgical treatment. In this article, we introduce orbital implantation surgery using cartilage and bone chips for the correction of delayed enophthalmos. **Methods:** Fifteen patients who had undergone orbital implantation surgery for correction of sustained enophthalmos were enrolled. Medical records were reviewed for past history, and preoperative and postoperative facial photographs and CT scans were taken to evaluate the improvement in enophthalmos. **Results:** The causes of enophthalmos were inappropriate surgical correction of orbital wall fracture (n=9), ignored blowout fracture (n=5), and fibrodysplasia (n=1). Preoperative eye ball protrusion difference of both orbit was 1.42 mm (SD=0.98), and it was reduced to 0.94 mm (SD=0.77) postoperatively. Three patients presented with diplopia preoperatively, and two of them showed improvement after surgery. Eight patients underwent reduction of old fractured orbital wall via endonasal and balloon support, six patients underwent open reduction surgery, and one patient underwent both procedure.



Pituitary Surgery 1

1141

Endoscopic Approaches for Resection of Pituitary Macroadenomas with different Suprasellar Extensions

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Pituitary Surgery 1 | Room 11 Hall 3.3 - Level 7 | Wednesday 21/06/2023

In pituitary macroadenomas with suprasellar extension (SSE), the possibilities for extra-capsular tumor resection through transsphenoidal approach provide a feasible alternative to craniotomy. Suprasellar region can be approached by extending exposure either anteriorly by endoscopic transtuberculum transplanum approach (ETTA) or posteriorly from inside sellar cavity by endoscopic transsellar transdiaphragmatic approach (ETSDA). We report the surgical outcome of all endoscopic approaches used for surgical resection of pituitary macroadenomas with SSE.

1156

Long Term Quality of Life among Patients Undergoing Endoscopic Pituitary Gland Resection with and without Middle Turbinectomy

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Introduction: Pituitary adenoma resection is associated with significant morbidity and can potentially damage patients' quality of life. The endoscopic approach to skull base lesions is considered less aggressive, and associated to improved tumor related and nasal related quality of life. However, there is an ongoing literature debate regarding the necessity to preserve the middle turbine during the procedure. **Objective:** The aim of the study was to compare tumor and nasal related quality of life in patients undergoing endoscopic endonasal resection of pituitary tumors with or without middle turbine preservation. **Materials and Methods:** Prospective cohort study of all patients with pituitary adenomas who underwent transphenoidal surgery at Tel Aviv Sourasky Medical Center between 2014 and 2021. Recruited patients completed the Anterior Skull Base Disease-Specific QOL (ASBS-Q) questionnaire and the Sinonasal Outcome Test 22 (SNOT-22) questionnaire prior to surgery and 3-6 months post-operatively. Demographic and clinical data were collected. **Results:** Our study included 56 patients, 46 patients underwent middle turbinectomy and 10 did not. The overall score difference of pre and post ASBS-Q score did not alter significantly between both groups (0.15 ± 0.64 among those who underwent middle turbinectomy vs 0.19 ± 0.74 among those who did not; $p=0.87$). SNOT-22 score difference also did not alter significantly (1.54 ± 15.29 vs 3.92 ± 16.84 , $p=0.32$) post operatively. **Conclusion:** We found that middle turbinectomy did not cause significant deterioration in nasal and tumor related QOL in the post-operative cohort.

1157

Long Term Quality of Life among Patients Undergoing Endoscopic Pituitary Gland Surgery

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Introduction: The endoscopic approach to skull base lesions is considered less aggressive than the microscopic and open approaches. Yet to date it was not evaluated for long term nasal and tumor related quality of life. **Objective:** To evaluate long-term quality of life in patients after endoscopic endonasal resection of pituitary tumors and detect predictors for poor quality of life. **Materials & Methods:** Prospective cohort study of patients with pituitary adenomas who underwent trans-nasal surgery at TSMC between 2014 - 2021. Recruited patients completed the Anterior Skull Base Disease-Specific QOL (ASBS-Q) questionnaire and the Sinonasal Outcome Test 22 (SNOT-22) questionnaire prior to surgery, and 1, 2 & 3 to 5 years after surgery. Demographic and clinical data was collected. **Results:** Our study included 43 patients. Overall ASBS-Q and SNOT-22 scores did not decrease throughout the duration of the study. SNOT-22 Score difference between baseline and the year 1, 3, 5 did not alter significantly. ASBS-Q score difference also did not alter significantly as well. Factors such as secreting and non-secreting tumors, tumor size, intraoperative cerebrospinal fluid leak, gross tumor resection, endocrine remission, and the use of nasoseptal flap reconstruction did not have a significant effect on QOL. **Conclusion:** Patients undergoing extended endoscopic approach for pituitary lesions maintained high nasal and tumor related QOL in the 5 post-operative years. This suggests that the endoscopic approach to skull base is as safe as effective approach and should be considered treatment of choice when



1211

Is endoscopic diving technique effective in the surgical treatment of functioning pituitary adenomas? A prospective randomized study

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Objective/hypothesis: Endoscopic diving technique (EDT) is an effective, cheap, and easy to perform surgical tool to ameliorate remission rates in functional pituitary adenomas (PA) after the endoscopic endonasal transsphenoidal surgery. **Methods:** This prospective randomized study was performed in Vilnius University hospital Santaros clinics in 2021-2023. This study enrolled 68 patients (19 – 77 years) with functioning pituitary adenomas. Patients were randomly attributed to either EDT (patients who underwent EDT at the end of the endoscopic endonasal transsphenoidal tumor removal) or non-EDT (EDT was not performed) groups. Patients were followed up to 2 years after the surgery and the endocrine and radiologic remission was evaluated 3 and 6 months postsurgery and 1-2 years later. **Results:** 68 patients with functioning PA were enrolled in this prospective study: 41 of them were attributed to the EDT group and remaining 27 – to the non-EDT group. Data analysis demonstrated that the endocrine remission was more frequent in the EDT group; however, the difference was not significant. On the other hand, 3, 6 months and 1-2 years after the surgery significantly less radiologic relapses were observed in the EDT group. Complication rates were statistically similar between the study groups and EDT did not carry any additional complication risk to patients. **Conclusions:** The use of the endoscopic diving technique after the endoscopic transsphenoidal surgery was associated with better endocrine and radiologic remission rates in functional PA patients.



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Mononostril, transnasal, paraseptal approach for pituitary adenomas

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Transnasal endoscopic pituitary surgery has more than hundred-year history. In the beginning wide approaches were used to achieve optimal exposure with the resection of nasal turbinates and septum. Nowadays we are increasingly trying to preserve the anatomical structures, thereby reducing approach-related morbidities. Our team uses mononostril paraseptal approach without ethmoidectomy to achieve the sellar region, which ensures a less traumatic procedure. One hundred and forty-five patients with pituitary gland pathologies underwent primary surgery (reoperations excluded). The most common pathology was pituitary macroadenoma (n=130, 90%), which showed suprasellar expansion in 94 (65%) cases and parasellar expansion in 50 (34%) cases. The most frequently observed complication was intraoperative liquorrhea, which was noticed in 14 (10%) patients, in 13 (9%) cases it was resolved during the same surgery. Late-onset liquorrhea was found in 2 (1,4%) patients. Transient diabetes insipidus occurred in 22 (15%) patients, while in one (0,7%) case diabetes insipidus was irreversible. The 3-month postoperative MRI scans showed residual tumors in 29 (20%) patients, further intervention (reoperation or radiotherapy) was required in 15 (10%) cases. Mononostril, transnasal, paraseptal approach without ethmoidectomy provides maximal exposure for the skull base despite its unilateral design while preserves the sinonasal mucosa the most and minimizes approach-related nasal morbidity.



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Impact of transsphenoidal pituitary surgery on orthonasal and retronasal olfactory function

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Introduction Various studies have investigated the impact of transsphenoidal pituitary surgery (TPS) on olfactory function and have found contradicting results. These studies rarely comprised more than 50 patients and none investigated retronasal olfactory function. Our study aims to assess orthonasal and retronasal olfactory function following TPS in a larger cohort. **Material and methods** Two hundred patients were enrolled in this monocentric retrospective study and were submitted to orthonasal and retronasal psychophysical olfactory tests before and 3 months after TPS. **Results** Following TPS, no patient reported total loss of smell and 8% reported partial loss of smell. At 3 months post-surgery, no significant difference in olfactory function was observed compared to pre-operative function, whether orthonasally or retronasally. **Conclusion** The impact of TPS on olfactory function remains controversial in the literature and none investigated retronasal olfactory function. This present study on 200 patients suggests that TPS is at minimal risk of injuring orthonasal and retronasal olfactory function.



1506

Transsphenoidal nasal endoscopic approach to pituitary adenomas: early reports of a single center

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Pituitary Surgery 1 | Room 11 Hall 3.3 - Level 7 | Wednesday 21/06/2023

Introduction The most prevalent lesion in the pituitary region are benign tumors called pituitary adenomas. The direct and minimally invasive transsphenoidal nasal endoscopic approach is the most popular method for accessing the sellar area. We aim to present our data and technical details of the surgery with videos. **Material and Methods** At the CUF Descobertas hospital in Lisbon, Portugal, a retrospective analysis of the cases operated in the previous six years was completed. We frequently close the sellar area with a multilayer closure made of bone, Duragen[®] and nasoseptal flap. **Results** A total of 32 patients were included in this study. Male to female ratio was 50%. 56, 25% presented with macroadenoma and 43,75% were non-function pituitary adenomas. Most patients presented with symptoms from mass effect, either visual impairment and/or hypopituitarism. The main surgery complications were nasal synechias (28,1%), CSF leak (6,25%) and epistaxis (3,1%). Due to a few aneurisms present inside the tumor, we experienced one incidence of internal carotid artery damage. It was resolved with embolization. The risk of complications was not associated with tumour size ($p>0,05$). Visual function improved in 87,5% and recovery of pituitary function in 62,5%. Maximum tumour diameter was associated with unfavorable surgical outcome. **Conclusion** This approach for pituitary adenomas seems to be safe and leading to satisfactory results. Our results are comparable to other studies.

1532

Correlation between nasal obstruction and quality of life in endoscopic vs. microscopic transsphenoidal pituitary surgery: a study in a low/middle-income country

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Few studies compare the post-operative nasal symptoms and quality of life in the microscopic vs. endoscopic transsphenoidal approaches for pituitary adenomas, particularly in low/middle-income Latin American populations. This ambispective study assessed the correlation between the perception of nasal obstruction and quality of life of endoscopic vs. microscopic transsphenoidal pituitary surgery at the Fundación Santa Fe de Bogotá, Colombia (January 2018- December 2019). A total of 46 patients (mean age: 50.57 years) who underwent pituitary resection for adenomas either by microscopic or endoscopic approach were included. Postoperative perception of nasal obstruction was assessed through the Nasal Obstruction Symptom Evaluation (NOSE) and a visual analog scale (VAS). Quality of life was assessed with the Glasgow Benefit Inventory (GBI). A median difference of 45 points favoring the microscopic approach was found in the global scores of the NOSE scale. A median difference of 4 points was found in the VAS score ($p < 0.001$ in both interventions). The GBI median scores were 27.78 points (IQR: 55.56), and 25.00 (IQR: 25) for the microscopic and endoscopic approaches, respectively. A negative correlation between the GBI and NOSE was found ($\rho = -0.44$; 95% CI: -0.684 to -0.095), implying that the less postoperative nasal obstruction, the better quality of life. Nasal obstruction and quality of life were correlated, highlighting the impact of sinonasal outcomes in patients' quality of life.



1641

Endoscopic Endonasal Transsphenoidal Surgery for pituitary adenomas: A 7-year experience from a tertiary centre

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Background: Pituitary adenomas account for the third most common intracranial neoplasm. Endoscopic endonasal transsphenoidal surgery (EETS) has gained increasing acceptance for the treatment of pituitary adenomas. **Methods:** Retrospective study of patients who underwent EETS for pituitary adenomas between September 2017 and January 2023. **Results:** There were 49 (62.8%) non-functioning adenomas and 29 (37.2%) hormone-secreting adenomas. Gross-total resection of the pituitary adenoma was achieved in 47 patients (60.3%). Preoperative cavernous sinus invasion was associated with lower resection rates (gross-total resection rate 44.0% vs. 71.7%, $p < 0.05$). Of the 45 patients who experienced preoperative vision deterioration, 41 (91.1%) achieved visual remission. Chemical remission in functional adenomas was achieved in 75.9%. The most common complications were new pituitary deficit (26.9%), diabetes insipidus (7.7%; permanently in one [1.3%]) and cerebrospinal fluid (CSF) leak (6.4%). There was no significant difference in postoperative CSF leak rate between patients undergoing free mucosal graft (7.7%) and nasoseptal flap (6%) sellar reconstruction. Surgery-related mortality was 0%. **Conclusion:** EETS represents a safe and effective treatment for pituitary adenomas. Cavernous sinus involvement is associated with lower rates of complete surgical removal. Although nasoseptal pedicled flap constitutes the primary option for sellar reconstruction, free mucosal graft showed similar CSF leak rates.

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Prediction of sphenoid sinus septation using MRI compared to CT in transsphenoidal pituitary surgery

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Pituitary Surgery 1 | Room 11 Hall 3.3 - Level 7 | Wednesday 21/06/2023

Objectives: MRI and computed tomography CT are the most common imaging modalities used for presurgical assessment prior transsphenoidal pituitary surgery (TSS). It remains unclear whether both modalities are necessary as a standard approach. The study aims to evaluate whether MRI alone is sufficient to identify relevant intra-sphenoidal anatomical variations when compared to CT. **Methods:** Retrospective cohort study of 109 patients that underwent TSS at the University Hospital Basel between 2009-2016. Preoperative MRI (T1 and T2) were compared to CT. A "correctly" identified posterior termination at the skull base was defined as: true presence or absence of a bony septum contact to the 1. sella; 2. internal carotid artery; 3. evident asymmetry. Sensitivity and specificity analysis and intrareader variability testing using Cohens Kappa coefficient were performed. **Results:** 71/109 patients were eligible for analysis. MRI (T1/T2) was able to identify the correct number of intra-sphenoidal septa in 65 (92%) patients. Hence, MRI was able to reliably identify the existence of an intra-sphenoidal septum with a sensitivity of 99%. A correct posterior termination at the sella turcica was identified in 66 (97%), a posterior termination along the carotid artery in 63 (93%), and an evident asymmetry in 63 (93%) of cases. Hence, MRI had a sensitivity of 94%, 97% and 92%, respectively. **Conclusions:** MRI alone is feasible to reliably detect the posterior termination of a single intra-sphenoidal septum in cases without tumor infiltration of the posterior sphenoidal sinus wall.



CRS – outcome assessment 2

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Cohort description from the CHronic RHINOSinusitis Outcome Registry (CHRINOSOR) – A Real-World data study

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CRS – outcome assessment 2 | Room 12 Hall 40 - Level 6 | Wednesday 21/06/2023

Background: CHRINOSOR is a collaborative effort of 17 University ear-nose-throat (ENT) Departments in Europe that aims at improving our understanding of chronic rhinosinusitis (CRS), its comorbidities, and the effectiveness of its treatments in the Real-World setting¹. Methodology: Real-world data from adult patients (n=142) with a diagnosis of CRS by the ENT surgeon have been collected prospectively through the Galenus Health app. Data from 7 EU clinics on patient's profile, disease history, patient outcomes and relevant clinical outcomes were analysed. Also, CRS patients treated with biologic therapy (n=535) were included for retrospective analysis. Results: 75.4% of patients reported a previously diagnosed CRS with nasal polyps (CRSwNP) in the prospective cohort whereas all patients had CRSwNP in the biologic-treated cohort. Both self-reported allergy (58.5% and 58.8%) as well as asthma (64.4 and 63.3%) diagnosis were equally high in both cohorts, respectively. N-ERD was higher in the biologic-treated cohort (30.4%) compared to the prospective cohort (19.7%). Differences were observed in history of sinus surgery (range: 62.3-96.8%) and use of systemic corticosteroids (range: 63.5-100%) across countries in the biologic-treated cohort possibly impacted by varying eligibility criteria. Conclusions: Valuable scientific insights have been generated by the standardised collection of real-world data from different EU countries.



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Chronic Rhinosinusitis and quality of life.

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CRS – outcome assessment 2 | Room 12 Hall 40 - Level 6 | Wednesday 21/06/2023

Background: Chronic Rhinosinusitis (CRS) has a great impact on patients' quality of life. The aim of our work is to describe the characteristics of patients with CRS in our series. In addition, we aim to study the impact of the disease on the patients' quality of life and relate it to the endoscopic and radiological evaluation. Methods: The study included 75 patients with CRS from the Department of Rhinology who completed the SNOT-22 quality of life questionnaire over a 19-month period. Results: 91% of patients had CRSwNP. According to SNOT-22, 96% of patients have relevant changes in quality of life, 44% have moderate involvement, 36% have severe involvement, and 20% have mild involvement. The nasal area is most commonly affected (57%). On endoscopic examination, 81.5% of patients have bilateral polyp involvement. The Lund-Mackay Score is realized in 52% of patients. The most frequent results are Grade 2 (51.3%). 56% of patients receive intranasal corticosteroid treatment only. Surgical treatment is indicated in 16% of patients and biologic treatment in 14.7%. Conclusion: Currently, the impact on quality of life of CRS is considered the main criterion for evaluating disease severity and response to treatment.



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Comparative real-world outcomes of endoscopic sinus surgery versus Dupilumab for treatment of chronic rhinosinusitis with nasal polyps.

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CRS – outcome assessment 2 | Room 12 Hall 40 - Level 6 | Wednesday 21/06/2023

Background: Biologic therapy and surgery are the main options of treatment for severe chronic rhinosinusitis with nasal polyps. The objective was to compare outcomes over 1 year of follow up in two groups of patients treated with Dupilumab or endoscopic sinus surgery (ESS). Methods: We enrolled 44 patients treated with ESS and 49 treated with Dupilumab. In each follow-up visit we measured: nasal polyp score (NPS); SNOT-22 score; VAS for specific nasal symptoms and olfaction assessed by Sniffin Sticks identification test. Finally, we evaluated the need for oral corticosteroid and presence of local inflammation by nasal cytology. Results: Patients undergoing surgery had a faster improvement in NPS at 6 months ($p<0.05$) but needed more brief cycles of systemic corticosteroids. Patients treated with Dupilumab had a greater improvement in SNOT-22 and olfaction at 12 months ($p<0.05$). After 1 year of treatment with dupilumab only 6.1% of patients had local eosinophilia at nasal cytology while it occurred in 57% of patients treated by surgery. Conclusion: both treatments are effective at reducing symptoms of patients with CRSwNP. Patients undergoing surgery have less control of local inflammation. Patients treated with dupilumab reported greater improvement in nasal symptoms, especially in sense of smell.



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The postoperative quality of life in endoscopic frontal sinus surgery: a retrospective study

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CRS – outcome assessment 2 | Room 12 Hall 40 - Level 6 | Wednesday 21/06/2023

During the last decades significant experience has been gained in functional endoscopic sinus surgery procedures. However, the patient-reported outcomes of frontal endoscopic sinus surgery procedures are still poorly understood. In this study we try to assess the preoperative and postoperative quality of life in patients undergoing extended endoscopic frontal sinus surgery (Draf type 2 and Draf type 3 procedures) using the 22-item sino-nasal outcome test (SNOT-22). Out of 670 patients undergoing endoscopic sinus surgery and a total of 186 patients having undergone endoscopic frontal sinus surgery (Draf 2 or Draf 3), for a variety of diagnoses from 2015 to 2020, we selected 99 patients with chronic rhinosinusitis, who underwent frontal sinus surgery in isolation. The mean preoperative SNOT-22 was 45.6 points for patients undergoing Draf 2 and 59 for patients undergoing Draf 3. Mean SNOT 22 improvement was 22.9 points for Draf 2 and 37 points for Draf 3 respectively and remained significant in all time intervals. All symptoms improved by a far bigger extent in Draf 3 group, despite the considerably worse starting point, with only exception of loss of smell/taste. Effect size of Draf 3 was greatest in symptoms of being frustrated/restless/irritable, nasal blockage, reduced concentration, fatigue, runny nose and need to blow nose. Both groups achieve similar postoperative quality of life, despite the different starting points. Further investigation with SNOT-22 is essential for a more definite answer to "who" and "when" a patient benefits from endoscopic frontal sinus surgery.



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Measuring Nasal Patency and the Sense of Smell in CRSwNP Patients Treated with Dupilumab

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CRS – outcome assessment 2 | Room 12 Hall 40 - Level 6 | Wednesday 21/06/2023

Chronic rhinosinusitis with nasal polyps (CRSwNP) in the most severe forms is associated with a poor quality of life. Dupilumab has been suggested as an add-on treatment option for severe CRSwNP. Severe CRSwNP patients treated with Dupilumab in different rhinological units were followed up at 1, 3, 6 and 12 months from the first administration and were considered for this study. At baseline (T0) and at each follow-up, patients underwent nasal endoscopy and completed the sinonasal outcome test (SNOT)-22, a visual analogue scale (VAS) for smell/nasal obstruction, peak nasal inspiratory flow (PNIF) and the Sniffin' Sticks identification test (SSIT). The aim of the present study was to evaluate the effects of Dupilumab on recovering nasal obstruction and smell impairment. Moreover we assessed which method between PNIF and SSIT had the highest correlation with patients' response. 147 patients were included. All parameters improved during treatment ($p < 0.001$). At T0, no correlations were found between PNIF and nasal symptoms. Nevertheless, during the following evaluations significant correlations between PNIF changes and both nasal symptoms and NPS were observed ($p < 0.05$). At T0, SSIT did not correlate with SNOT-22. Similarly to PNIF, during the follow-up SSIT changes significantly correlated with nasal symptom and NPS ($p < 0.05$). Comparing PNIF and SSIT correlations with SNOT-22 and NPS, PNIF showed a higher correlation with both. Dupilumab improves nasal obstruction and the sense of smell. PNIF and SSIT are effective tools in monitoring patients' response to Dupilumab.

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Follow-up adherence and medication adherence after endoscopic sinus surgery effectively control the recurrence of chronic rhinosinusitis

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CRS – outcome assessment 2 | Room 12 Hall 40 - Level 6 | Wednesday 21/06/2023

Background : To explore the effect of follow-up or medication adherence after endoscopic sinus surgery (ESS) on the control status of chronic rhinosinusitis (CRS). **Methods :** A retrospective review of 226 patients with chronic rhinosinusitis under ESS in two clinical centers during 2018 to 2021 was conducted. Clinical characteristics including smoking, asthma, allergic rhinitis, sinus surgery history, endoscopic and CT scores, blood eosinophils number and percentage and serum total IgE were collected. Follow-up of symptoms which contained visual analogue scales, total nasal symptom score (TNSS), and sinonasal-outcome test 22 (SNOT-22) score, and assessment of endoscopic score and control status of CRS at the first and the twelfth month after ESS were conducted. **Results :** Patients with both follow-up adherence and medication adherence had the highest control rate (71.2%), the second higher rate was in patients with follow-up adherence but medication non-adherence (42.1%) more than patients with medication adherence but follow-up non-adherence (22.7%) and patients with follow-up non-adherence and medication non-adherence (5.1%). ($P < 0.0001$) All VAS, TNSS, SNOT-22, E-score% were different especially in the twelfth month after ESS (all $P < 0.0001$) in the trend in the accord with the controlled rate above. Baseline characteristics did not influence the control status. **Conclusions:** Follow-up adherence and medication adherence after ESS effectively control the recurrence of chronic rhinosinusitis especially in a long term.



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Development of a standardized assessment of patient reported outcome measures following endoscopic sinus surgery for chronic rhinosinusitis: A qualitative study.

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CRS – outcome assessment 2 | Room 12 Hall 40 - Level 6 | Wednesday 21/06/2023

Background: Quality of life (QOL) outcomes following endoscopic sinus surgery (ESS) have been reported, yet few outcome measures have been developed through direct patient participation. Harmonizing patient reported outcome measures (PROM), observer based, and other evaluation techniques is paramount to enable the Otolaryngologist to produce clinically meaningful assessments. This study aimed to create a clinical instrument from PROMs to assess patients after treatment of chronic rhinosinusitis (CRS) with ESS. Methods: This four-phase qualitative study employed grounded theory methodology and a modified Delphi technique. In Phase I, 15 patients were interviewed using open-ended questioning for identification of QOL domains impacted by CRS. Domains were presented in phase II to a focus group of new CRS patients who ranked each by order of importance. A conceptual framework of QOL domains impacted by CRS was created based on patient consensus and a focus group of Otolaryngologists itemized the PROM questionnaire in phase III. The questionnaire was completed by cognitive interviewing of new CRS patients in Phase IV. Results: Patients identified 15 domains of QOL occupying three sub-scales: physical symptoms, psychosocial symptoms, and activity restriction. These domains provided the basis for the creation of a 19-item PROM questionnaire. Conclusions: Clinical application of the novel questionnaire produced by this study yields objective assessment of patient reported effectiveness of ESS for management of CRS. Further study will aim to validate this newly developed technique.

**1692****The Role of Blood and Tissue Eosinophilia on Prognosis of Chronic Rhinosinusitis with Nasal polyposis****Mohammed Alwashahi¹**¹*Department of Otorhinolaryngology, University Hospital Regensburg, Franz-Josef-Strauss-Allee 11, D-93053 Regensburg, Germany*

CRS – outcome assessment 2 | Room 12 Hall 40 - Level 6 | Wednesday 21/06/2023

Abstract: Objectives :This study aimed to investigate the role of the blood eosinophil count (BEC) in categorizing Chronic Rhinosinusitis with Nasal polyposis (CRSwNP) and its role in predicting the need for revision functional endoscopic sinus surgery (FESS). Patients and methods:This study included 121 CRSwNP patients who underwent endoscopic sinus surgery. The preoperative BEC, Lund-Mackay scores and the endoscopic scores of the patients were collected from the medical record. Using haematoxylin and eosin staining (H&E) the cut-off value of tissue eosinophil count (15/HPF) was used to divide the patients into groups of eosinophilic and non-eosinophilic CRSwNP. Results:We recruited 40 patients in the eosinophilic CRSwNP group and 81 patients in the non-eosinophilic CRSwNP group. The level of BEC in the eosinophilic CRSwNP group was significantly higher than that of non-eosinophilic CRSwNP group ($0.79 \pm 0.27 \times 10^9/L$ vs $0.30 \pm 0.22 \times 10^9/L$; $p < 0.001$). We observed a statistical significance in CRSwNP phenotypes (eosinophilic/non-eosinophilic, 28/3 vs 2/32; $p < 0.001$) when the cut-off value of BEC was set at $0.4 \times 10^9/L$. Preoperative BEC and Lund-Mackay score were associated significantly with the need for FESS ($p < 0.032$ and $P = 0.01$ respectively), whereas endoscopic NP score and SNOTT22 score were not ($p > 0.05$). With the cut-off values of ($BEC \geq 0.7 \times 10^9/L$) and the cut-off value of (LM score ≥ 17), the sensitivity and specificity were optimal for predicting the group needing revision FESS ($p = 0.006$ and $p = 0.041$, respectively). conclusion :The results suggest that BEC m..

Benign nasal tumours 2

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CAN WE PREDICT WHO WILL BENEFIT FROM NASAL STEROID TREATMENT IN PATIENTS WITH NASAL POLYP DIAGNOSIS BY CLINICAL AND PATHOLOGY?

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Benign nasal tumours 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

OBJECTIVE In patients with a diagnosis of nasal polyps, the predictability of treatment success is investigated by clinical and pathologic evidences. **MATERIAL AND METHODS** Pretreatment and posttreatment (3 months of 100 µg/day nasal steroid), Meltzer scores, SNOT-22 questionnaire scores and Butanol Threshold Test results of 54 patients were recorded and compared. Meltzer 1-2 classified as mild, 3-4 severe. Eosinophil and mast cell counted in pathology preparations taken before treatment. Correlation analysis were made with Snot-22 score difference. **RESULTS** In mild nasal polyps, the difference between BTT scores before (mean: 4.11) and after (mean: 5.52) and Snot-22 scores before (mean: 29.58) and after treatment (23.64) was significant ($p < 0.05$). The difference between BTT before (mean: 2.35) and after (3.59) was significant in severe nasal polyps. ($p < 0.05$) There was no significant difference between Snot-22 scores before (mean: 38.1) and after (mean: 37.97) treatment in patients with severe nasal polyps. ($p > 0.05$). Moderately significant correlation was found between the number of mast cells and the change in SNOT-22 scores. (CC: 0.47) **CONCLUSION** It was observed mast cell count can be used in terms of treatment benefit and nasal steroid treatment was beneficial in patients with Meltzer grade 1-2 but there was no improvement in the patients' Snot-22 scores when 3-4 polyps were detected. Consequently, early surgery may be recommended for patients with grade 3-4 nasal polyps.

1603

Clinical analysis of sinonasal hemangiopericytoma

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Benign nasal tumours 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Objective: To investigate the clinical features, therapeutic methods and therapeutic effects of sinonasal hemangiopericytoma. **Methods:** Clinical data of 6 patients with sinonasal hemangiopericytoma, diagnosed by pathology and immunohistochemistry between January 1990 and December 2012 were analyzed retrospectively. There were 4 males and 2 females, with a median age of 58 years. Clinical manifestation included epistaxis and nasal obstruction. These patients were operated on by nasal endoscopic surgery or endoscope-assisted surgery, of which 2 cases of tumor located in the nasal cavity underwent nasal endoscopic surgery and 4 cases of tumor located in the nasal cavity and sinuses underwent endoscope-assisted surgery. **Results:** All the patients were followed up for a period of 6 months to 7 years after operation. Two cases recurred and 4 cases didn't recur. One case recurred 6 months after operation and underwent second operation, with no recurrence by further one year follow-up. Another case recurred 17 months after operation and underwent second operation, with recurrence by further 9 months follow-up. This patient lived with tumor over two years. **Conclusions:** Hemangiopericytomas are rarely found in the sinonasal cavity. Nasal endoscopic or endoscope-assisted surgery provides satisfactory effect.



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Successful Management of a Rare and Aggressive Extranasopharyngeal Angiofibroma Arising from the Nasal Septum in a 59-Year-Old Female

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Benign nasal tumours 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Background Extranasopharyngeal angiofibromas are rare benign tumours which can present with significant epistaxis, and usually arise from the posterolateral wall of the nasal cavity. They can, therefore, present a diagnostic and management challenge when they occur, and do so in unusual locations. We describe a rare case of an angiofibroma originating from the anterior nasal septum and its successful management. **Case:** A 59-year-old female presented with left-sided epistaxis and nasal obstruction. Examination revealed a small, pedunculated, vascular lesion on the anterior nasal septum which grew rapidly over a period of weeks to deform the nares and extrude externally. The patient underwent semi-elective excision biopsy with a left supra-perichondral flap raised via a Killian's incision to remove the tumor, with the aid of coblation for debulking. Histological examination confirmed that it was an angiofibroma, and no residual or recurrent disease was observed during follow-up. **Conclusions:** This case underscores the need for clinicians to consider the possibility of extranasopharyngeal angiofibroma in the differential diagnosis of head and neck tumors, particularly in cases of significant epistaxis. Clinicians should be aware that angiofibromas can occur in unusual locations and that prompt and accurate diagnosis is critical for optimal patient management. This report also highlights the successful use of a left supra-perichondral flap and coblation in the surgical management of this rare and aggressive presentation.

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A CLINICAL STUDY OF 5 CASES WITH BLOOD BOILS OF THE MAXILLARY SINUS

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Benign nasal tumours 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Introduction: Blood boils is a benign and non-neoplastic lesion that may cause bleeding or bone destruction. **Material and methods:** We retrospectively analyzed 5 patients with blood boils of the maxillary sinus treated from June 2015 to December 2017. Subjects were 3 men and 2 women, aged 14 to 90 years (mean: 51 years). In all, we conducted endoscopic sinus surgery (ESS) under general anesthesia without prior arterial embolism. 70-degree endoscope, microdebrider and curved blade were used for resection blood boils of the maxillary sinus. **Results:** The diameters of blood boils were 30-55 mm (mean: 41 mm). The operation times for ESS in ethmoid and maxillary sinuses were 45-108 minutes (mean: 79 minutes). Amounts of bleeding were from small amount to 225ml. Though the amounts of bleeding significant correlated between operating times (coefficient-of-determination $R^2=0.83$), those did not correlate between the diameter. **Discussion:** The correlation amounts of bleeding between operating times was due to persistence bleeding by more veinous than arterial. It is important to shorten operating times for minimum blood loss. The appearance of microdebrider and curved blade made possible to resect the maxillary sinus blood boils by ESS without prior arterial embolism.

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ENDOSCOPIC RESECTION OF JEUVENILE NASOPHARYNGEAL ANGIOFIBROMA

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Abstract: Juvenile nasopharyngeal angiofibroma (JNA) is a rare tumor in young males, with a non-negligible potential for recurrence. Preoperative embolization is a safe procedure that diminishes the preoperative blood loss and the need for blood transfusion. **Objectives:** To evaluate the endoscopic technique in management of JNA. The four hands technique and the endoscopic assisted techniques are also described. **Patients and methods:** We report a series of 10 consecutive cases operated by exclusive endoscopic approach from January 2012 to November 2015. All were male. The mean age was 14.5 years old. The endoscopic approach was used with good results in JNA stages Radkowski I to IIIa. **Results and conclusion:** All patients underwent surgery, and the endoscopic approach was used in all cases. The embolization procedure proved to be safe and decreased the intraoperative blood loss. In conclusion, endoscopic resection of JNA is a difficult but effective operation in experienced hands. Based upon the recent international literature, endonasal surgery combined with a preoperative embolization of the arterial supply is indicated for small and middle size JNAs but also for large tumors extended to the pterygopalatine fossa and medial aspect of the infratemporal fossa.



1705

Burkitt's lymphoma in the pterygopalatine fossa

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Introduction: Burkitt's lymphoma is a high-grade B lymphoma. It can present in an endemic, typical in children between 5 and 7 years of age and with greater involvement of the facial bones; or sporadic form, more frequent in 12-year-old children and as an abdominal mass. It's presentation in nasal sinus and in adults is rare. **Materials and methods:** A 79-year-old patient with no history of interest, starts with a trigeminal neuralgia resistant to medical treatment. In the MRI a 6x4cm tumor was identified in the left chewing space with aggressive behavior. It extends to the nasopharynx, pterygoid musculature, infiltrates the lower and middle turbinates, reaches the left buccal and parapharyngeal spaces, and infiltrates the hard palate, floor of the left maxillary sinus and left infraorbital fissure. Cranially it extends to the temporal lobe, cavernous sinus, sella turcica, sphenoid sinus, sphenoid wing, clivus, and the pontine cistern. An intraoperative biopsy was taken by endonasal endoscopic surgery (Denker edoscopic) after embolization of the internal maxillary artery. **Result:** The result of the biopsy was high-grade B lymphoma compatible with Burkitt's lymphoma with a high proliferative index (80%). Treatment with curative chemotherapy was started, but the patient passed out 3 weeks after diagnosis. **Discussion:** Burkitt's lymphoma is rapidly progressive and can be highly invasive with minimal symptoms. The worst prognostic factors are adult onset, central nervous system involvement at diagnosis, and bone marrow infiltration. In our case, the patient had these three factors.



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Conservative Surgical Management of a Maxillary Odontogenic Myxoma: a Case Report

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Introduction Odontogenic myxomas are rare slowly growing but locally aggressive benign tumors. They have an ectomesenchymal origin and histologically they present stellate or spindle-shaped cells within a myxomatous tissue stroma. The most common location is the mandible, followed by the maxilla. Surgery remains the gold-standard treatment, but a complete resection with negative margins implies an excessively aggressive surgery for an otherwise benign tumor. **Objective** To describe a rare case of a maxillary odontogenic myxoma with emphasis on the conservative surgical procedure. **Case Report** A 26-year-old female presented to an ENT clinic with a left midfacial swelling. CT scan showed a destructive lesion of left maxilla with partial erosion of the anterior and the medial walls of maxillary sinus, hard palate and left superior alveolar ridge. Endoscopic nasal biopsy revealed an odontogenic myxoma. Surgical alternatives were discussed with the patient. A total tumor removal was performed by a combined approach: endoscopic medial maxillectomy (to remove nasal fossa, maxillary and pterygopalatine fossa components) and sublabial Roughe Denker approach (to remove anterolateral and alveolar roots components). No complications were recorded. Patient is rigorously controlled with regular nasal endoscopy and MRI. **Conclusion** Whenever possible, conservative approach should remain the first-line treatment of an odontogenic myxoma particularly in young patients. They should be advised of surgical alternatives and their recurrence rates.



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Identification and 3D reconstruction of sinonasal inverted papilloma pedicle

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Our study aimed at finding an instrumental method of evaluation of volume and surface of IP, analyzing CT imaging using 3D reconstruction. The clinical documentation of patients treated between 2002 and 2021 at Policlinico San Matteo IRCCS for IP with endoscopic surgery were reviewed. CT imaging were analyzed for morphological information and 3D reconstruction. The parameters evaluated were Volume, Surface and Base Area of the IP. Furtherly analyzing CTs, three grades of distinction of the pedicle, its shape and site of origin were defined. CT-acquired information was compared with the intraoperative findings. The study confirmed the crucial role of CT imaging in the localization, morphological evaluation and, through the 3D resolution, reconstruction of the pedicle. This study represents an important starting point in the improvement of the 3D reconstruction of sinonasal district, especially focusing on the pedicle of the IP, resulting in a more personalized of the surgical planning.

CRS – medical management 4

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Dupilumab improved objective and patient-reported outcomes in patients with chronic rhinosinusitis with nasal polyps (CRSwNP) and complete bilateral nasal obstruction in the SINUS-24 and SINUS-52 trials

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Background: In CRSwNP, nasal polyp score (NPS) of 8/8 signifies complete nasal obstruction. Dupilumab is efficacious in severe CRSwNP; here we report outcomes in patients with NPS=8. **Methodology:** Post-hoc analysis of patients with NPS=8 at randomization in SINUS-24/SINUS-52 (NCT02912468/NCT02898454), receiving dupilumab 300 mg/placebo q2w. **Assessments:** NPS (0–8), peak nasal inspiratory flow (PNIF), Lund–Mackay computed tomography (LMK-CT; 0–24), nasal congestion, loss of smell (NC, LoS; 0–3), 22-item Sino-Nasal Outcome Test (SNOT-22; 0–110). **Results:** 98/724 (13.5%) patients had baseline NPS=8 (placebo/dupilumab, 30/68). Mean (SD) baseline PNIF (L/min), LMK-CT, NC, LoS, SNOT-22 were 33.8 (45.1), 18.9 (3.9), 2.7 (0.4), 2.9 (0.3), 56.9 (21.6), respectively. All assessments improved with dupilumab versus placebo at Week (W)24 (least squares mean difference [95% CI]): NPS –2.04 [–2.67, –1.40], PNIF 65.9 [39.4, 92.4], LMK-CT –4.97 [–6.50, –3.44], NC –1.30 [–1.72, –0.89], LoS –0.96 [–1.39, –0.54], SNOT-22 –25.3 [–34.1, –16.4], with similar results at W52. At W24, 69.1%/10.0% patients (dupilumab/placebo) achieved NPS improvement ≥ 1 ; 51.5%/0% LMK improvement ≥ 5 ; 73.5%/16.7% NC improvement ≥ 1 ; 60.3%/20.0% LoS improvement ≥ 1 ; all $p < 0.0001$; 73.5%/40.0% SNOT-22 improvement ≥ 8.9 ($p=0.0010$). **Conclusions:** In CRSwNP patients with complete bilateral nasal obstruction, dupilumab treatment demonstrated significant, clinically relevant reduction in NPS, and improved nasal inspiratory flow, symptoms, and health-related quality of life.

1531

Oral Corticosteroid (OCS) Burden and Healthcare Resource Utilization (HCRU) in Patients with Chronic Rhinosinusitis with Nasal Polyps (CRSwNP) Undergoing Functional Endoscopic Sinonasal Surgery (FESS) in US Real-World Practice

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Rationale: The impact of FESS on OCS burden and HCRU in CRSwNP is unclear. **Methods:** Claims-based study (Optum; 2011–2021). CRSwNP patients undergoing FESS were propensity-score matched with patients not undergoing FESS. Intervention/follow-up periods were Day 0–44/45–365. OCS burden (cumulative dose in mg prednisone equivalents)/HCRU/costs were compared among FESS vs non-FESS patients in the 1-year post-surgery period and change in OCS dosing from the 1-year baseline period to follow-up (pre/post-index). **Results:** Each group included 8,909 patients. During follow-up, OCS use was lower among FESS vs non-FESS patients (mean difference in cumulative dose: –40 mg [95% CI –64, –16] per patient); in patients who filled an OCS prescription (34.6% vs 36.0%), OCS burden remained high (mean [SD] cumulative dose 521 [786] mg vs 612 [906] mg). Proportion of baseline OCS users (FESS n=5,636; non-FESS n=5,728) with decrease/increase/no change in dosing was similar in both groups (80.5%/19.3%/0.2% vs 77.3%/22.5%/0.2%). Mean total healthcare costs during intervention period were \$28,832/\$2,537 (FESS/non-FESS), but similar during follow-up (\$15,659 and \$15,926, respectively). HCRU was similar during follow-up, except more FESS patients visited an otolaryngologist (57.5% vs 32.0%, p<0.01). **Conclusions:** CRSwNP patients undergoing FESS have similar OCS burden compared to those not undergoing FESS, with similar costs during follow-up.



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Characteristics of Patients with Chronic Rhinosinusitis with Nasal Polyps (CRSwNP) Who Did or Did Not Undergo Functional Endoscopic Sinus Surgery (FESS) in US Real-World Practice

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Rationale: Data regarding the characteristics of patients with CRSwNP who undergo FESS vs those who do not are limited. **Methods:** Retrospective cohort study of patients with CRSwNP with/without FESS in US real-world practice (Optum claims data 2011–2021). Demographics were assessed on the index date, and comorbidities/OCS use over the 12 months pre-index. **Results:** This analysis included 9,305 FESS and 34,446 risk-set matched non-FESS patients. FESS patients were younger vs non-FESS (mean 52 vs 57 years, $p < 0.01$) and more likely commercially insured (69% vs 59%, $p < 0.01$). High proportions of patients in both groups had a diagnosis of acute sinusitis (47.2% [FESS] vs 33.5% [non-FESS], $p < 0.01$), allergic rhinitis (51.9% vs 53.1%, $p = 0.05$), asthma (25.7% vs 29.8%, $p < 0.01$), sleep disorders (21.1% vs 20.0%, $p = 0.02$), depression (12.9% vs 12.1%, $p = 0.03$), and anxiety (13.9% vs 13.8%, $p = 0.86$). Use of oral corticosteroids (OCS) was high in both groups (64.6% vs 52.2%, $p < 0.01$) and higher in FESS vs non-FESS patients 30 days (28.5% vs 10.3%, $p < 0.01$) and 60 days (40.7% vs 18.2%, $p < 0.01$) pre-index. **Conclusion:** In US clinical practice, although patients with CRSwNP undergoing FESS appear to have more acute sinusitis and greater OCS use, both FESS and non-FESS patients share significant comorbidity and systemic treatment burden.

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The impact of mepolizumab therapy on sleep in patients with chronic rhinosinusitis with nasal polyps: data from the SYNAPSE study

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Background: Sleep disturbance is one of the most bothersome patient-reported symptoms of chronic rhinosinusitis with nasal polyps (CRSwNP). In the Phase III SYNAPSE study, 4-weekly mepolizumab 100 mg treatment for 52 weeks reduced NP size and symptoms versus placebo in patients with severe CRSwNP; here, we compare impact on sleep-related outcomes. **Method:** Change from baseline in sleep-related sinonasal outcome test (SNOT-22) item scores from the Sleep Domain and Fatigue Domain at Week 52 were assessed post hoc. Patients rated severity and frequency of each item from 0 (no problem) to 5 (as bad as can be). **Results:** Of 407 patients enrolled in SYNAPSE, 403 (mepolizumab=205, placebo=198) had baseline SNOT-22 data available. At Week 52, mean improvements from baseline in all 4 sleep-related SNOT-22 item scores were significantly larger in mepolizumab- versus placebo-treated patients (treatment difference (95% confidence interval): difficulty falling asleep -0.9 [-1.2,-0.5]; wake up at night -1.0 [-1.3,-0.6]; lack of good night's sleep -0.8 [-1.2,-0.5]; wake up tired -0.9 [-1.2,-0.5]; all p<0.001). **Conclusions:** Sleep improvements were observed in patients with CRSwNP following treatment with mepolizumab, suggesting that mepolizumab can improve sleep disturbances in this population. **Funding:** GSK [GSK ID:205687/NCT03085797] Abstract previously presented at the EAACI 2022 Congress.

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Assessment of patient eligibility for biologic therapy: Real-World data from the CHronic RhINOSinusitis Outcome Registry (CHRINOSOR)

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Background: Biologics are a therapeutic option for uncontrolled, severe chronic rhinosinusitis with nasal polyp (CRSwNP) patients. Applying a mobile application, we investigated eligibility criteria for biologics, published earlier by Bachert et al¹, in a Real-World setting. Methodology: Adult patients (n=142) from 7 EU university clinics, diagnosed with CRS by the ENT surgeon and using the Galenus Health mobile application have been included. Complete data on required outcome parameters of 100 patients were available for this interim analysis. Results: 75.4% of analysed patients reported a previously diagnosed CRSwNP. 81.6% of CRSwNP patients reported either a history of endoscopic sinus surgery (ESS) (only ESS: 71.6%) or ≥ 1 systemic corticosteroid (OCS or injected) course in the past year (only steroids: 55.6%). Within these patients, a NPS 4 or 5 was observed in respectively 49.0% and 31.3% of patients. Of patients with NPS 4, 64% showed a SNOT-22 score 35 points or a VAS total sinus symptoms 5 pointing towards severe symptoms. Taken together, we identified 23.9% of CRSwNP patients meeting definitions of uncontrolled, severe CRSwNP. Conclusions: This first Real-World analysis from patients recruited at academic hospitals showed that almost a quarter of CRSwNP patients could meet the EUFOREA eligibility criteria for biologic therapy.

1547**The Effectiveness of Budesonide Nebulizer After Endoscopic Sinus Surgery in Chronic Rhinosinusitis in Non-Asthmatic Patients**Khalid Hakami¹

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CRS – medical management 4 | Room 8 Hall 4 - Level 0 | Wednesday 21/06/2023

Context: nasal irrigation had a better effect than normal saline nasal irrigation. Nebulized budesonide is an effective and safe treatment for patients with allergic fungal rhinosinusitis (AFRS) or chronic rhinosinusitis with nasal polyps (CRSwNP), following endoscopic sinus surgery. Aims: to evaluate the efficacy of postoperative use of nebulized budesonide in patients with chronic rhinosinusitis. Subjects and Methods: A retrospective examination of the patients who underwent endoscopic sinus surgery to measure the effectiveness of budesonide nebulizer on post-operative and recurrence symptoms was conducted using the questionnaires between 2016 and 2020 at Al-Hada Armed Forces Hospital in the Western region of Saudi Arabia. Statistical analysis: descriptive statistics included mean, standard deviation, frequencies, and percentages, and inferential statistics such as independent t-tests and Chi-square were carried out using the Statistical Package for the Social Sciences software (Version 26.0 IBM SPSS Corp., Armonk, NY, USA). Results: The study included 111 patients who underwent endoscopic sinus surgery; 27.9% had a history of bronchial asthma. Budesonide nebulizer usage was reported to be 55.9%. At 2nd, 3rd, and 8th weeks postoperatively, patients who were not utilizing a Budesonide nebulizer had significantly greater signs of crustation, nasal blockage, headache, malodor, anosmia, and secretions than those who were. Conclusions: Although further research is needed, utilizing a nebulizer to deliver budesonide to the sinonasal mucosa is more effective and affordable than employing nasal irrigation.

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Assessment of the Prevalence of Use of Nasal Decongestants Among General Population in Saudi Arabia

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BackgroundA topical nasal decongestant (NDC) is widely prescribed in ENT practice and used as self-medication because it is available over the counter, which makes it an easily accessible medication. Due to its common and long-term use, it is associated with serious nasal complications. It is commonly self-administrated in many otolaryngology diseases like the common cold, sinusitis, and acute or chronic rhinitis. The long-term usage of nasal decongestants is associated with significantly increased side effects.**Aim**To assess the prevalence of the usage of nasal decongestants among the general population in Saudi Arabia ad the pattern of its use.**Methodology**A questionnaire-based, cross-sectional survey was applied to level all available populations in Saudi Arabia. Participants with ages aged 10 to 60 years old in Saudi Arabia were invited to participate in the survey. Data were collected from participants using a predesigned online questionnaire. The questionnaire included the participant's demographic data, NDC use, and pattern of use. The questionnaire was uploaded online by researchers and their friends using social media platforms.**Results**A total of 1456 participants completed the study questionnaire. Participants ages ranged from 10 to 60 years with a mean age of 26.9 ± 12.4 years old. Exact 585 (40.2%) participants were males and 1270 (87.2%) were from urban regions. A total of 657 (45.1%) respondents reported using nasal decongestants while 799 (54.9%) did not use NDC. As for the duration of use, 70.8% used NDC for less than five days and 13.5% used it for 5-15 days. Th

1636

Exploration and safety evaluation of hormone nebulized administration in promoting recovery after endoscopic sinus surgery

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Objective: To investigate the efficacy and safety of using nasal pulse nebulized budesonide in patients after functional nasal endoscopy (FESS). **Methods:** A total of 40 patients with chronic sinusitis who underwent functional nasal endoscopic surgery (FESS) in our hospital were randomly divided into nebulized inhalation group (n=20) and oral hormone group (n=20) using a random number, all patients received the same postoperative routine treatment, both groups of patients were followed up in our hospital outpatient clinic after 2 weeks, after cleaning up the nasal tamponade material on the 14th postoperative day, the nebulization group began to nebulize inhalation budesonide suspension, and the other group took methylprednisolone tablets orally, both for 2 weeks. Visual analogue scores (VAS) and Lund-Kennedy endoscopic scores for nasal symptoms (nasal congestion, runny nose, smell, headache) were performed before and after treatment to assess safety by adverse events and morning serum glucocorticoid levels. **Results:** After 12 weeks of follow-up treatment, 2 cases were dropped in the oral hormone group, and the VAS visual analogue score of the 2 groups was significantly reduced, and the Lund-Kennedy endoscopic score of the nebulized group and the oral group was also significantly reduced, the morning serum glucocorticoid concentration in the nebulized group decreased after treatment, but there was no significant statistical difference, while the morning serum glucocorticoid concentration in the oral group was significantly reduced after treatment, and obvious periadrenal corticosteroid suppression was visible. **Conclusion:** The application of glucocorticoid pulse atomization after FESS can fully diffuse the drug to the sinus oronasal tract complex, and its area of action is more extensive, which can significantly reduce the edema reaction of the mucosa in the operative cavity and promote the benign outcome of the mucosa. It has no significant inhibitory effect on the hypothalamic-pituitary-adrenal axis, which is safer than traditional oral hormone therapy. May be used as a postoperative treatment option for chronic sinusitis.



Epistaxis and HHT 2

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"TIMolol nasal spray as a treatment for epistaxis in Hereditary Hemorrhagic Telangiectasia (TIM-HHT) – A prospective, randomized, double-blind, controlled cross-over trial"

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Epistaxis and HHT 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

Question Can the effectiveness of the standard treatment for epistaxis in hereditary hemorrhagic telangiectasia (HHT) patients with a pulsed diode laser be increased by additionally use of timolol nasal spray? **Findings** This randomized, placebo-controlled, cross-over trial included 18 HHT patients and showed a reduction of the severity of epistaxis and an improvement of subjective satisfaction in the timolol group compared to the placebo group. These effects were statistically reliable at the 1-month assessment point, but just fell short of the conventional significance level after three months. **Meaning** Timolol nasal spray has a measurable positive effect on epistaxis and satisfaction in HHT patients when used additively to standard laser therapy.

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Refractory epistaxis with hereditary hemorrhagic telangiectasia

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Epistaxis and HHT 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

Hereditary hemorrhagic telangiectasia (HHT) is a rare autosomal dominant disease characterized by systemic telangiectases and larger vascular malformations. Herein, we report a case of a 64-year-old woman who complained right refractory epistaxis for 16 years. Physical examination showed a paving stone-like characteristic in mucocutaneous junction on right nasal septum, telangiectasia on left nasal septum mucosa, oral labial mucosa, tongue and fingers. Radiography and angiography confirmed pulmonary arteriovenous malformation in the bilateral hemithorax and occluded middle cerebral artery with increased small blood vessels in left brain. Lab examination showed serious anemia by low hemoglobin of 59 g/L. Nasal packing, blood transfusion and long-term oral ferrous lactate supplement were the main treatment methods before. In addition, recurrent mild epistaxis happened in her son and granddaughter. Collectively, she was diagnosed as hereditary hemorrhagic telangiectasia according to the Curaçao Criteria for the first time. The patient was urgently given electrocoagulation and then nasal packing with NasoPore to stop bleeding, as well as blood transfusion. Then a continued treatment of thalidomide for 3 months was prescribed, with symptom of epistaxis significantly alleviated after 3-month follow-up. The results of genetic testing were positive for endoglin with heterozygous frameshift mutation in NM_001114753.2: c.210_214dupCAAGG in the patient, her son and her granddaughter.

1245

Treatments of Epistaxis in Hereditary Hemorrhagic Telangiectasia: Systematic Review and Network Meta-Analysis

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Epistaxis and HHT 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

BackgroundEpistaxis is the most common presenting symptom of Hereditary Hemorrhagic Telangiectasia (HHT). This study aimed to analyze the effects of various kinds of epistaxis treatment for HHT patients.**Methods**PubMed and EMBASE were searched until October 30th, 2022. Randomized controlled trials (RCTs) studying the effects of any treatments in adults with HHT were included. Network meta-analysis was conducted assessing epistaxis severity score (ESS), frequency and duration of epistaxis, quality of life, visual analog scale (VAS), hemoglobin level, and adverse event. **Results**Of total of 18 RCTs, the data from 14 RCTs (634 patients, 7 treatments: timolol, bevacizumab, doxycycline, tacrolimus, propranolol, estriol, and tranexamine) could be pooled in the meta-analyses while the others (4 treatments: electrosurgical coagulation, LASER, tamoxifen, and estradiol) were reviewed qualitatively. When compared to placebo, propranolol offered the most improved ESS -1.68 [95% confidence interval, CI, -2.80, -0.56] followed by timolol -0.40 [95%CI -0.79, -0.02]. Moreover, tranexamine significantly reduced the epistaxis frequency -1.93 [95%CI -3.58, -0.28]. The other treatments had indifferent effects to placebo. The adverse events from tranexamine, tacrolimus, propranolol, and estriol were significantly reported. **Conclusions**Propranolol, timolol, and tranexamine were the only treatments which offered benefits to HHT patients in epistaxis management with some concerns of adverse events in propranolol, tranexamine, tacrolimus, and estriol.



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Long-term control of Epistaxis in in Hereditary Hemorrhagic Telangiectasia with Blue Light Laser Treatment

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Epistaxis and HHT 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

Hereditary hemorrhagic telangiectasia (HHT) is a hereditary condition that is associated with arteriovenous malformations. Core symptom of the disease is epistaxis. According to the latest guidelines ablative therapies, including laser treatment with ND: YAG laser or KTP laser are an established therapy for endonasal manifestations. Since recently, the blue light laser has expanded the spectrum of laser treatment of nasal Osler's disease. To date, the effectiveness of this laser has hardly been investigated. In the retrospective study presented here, we present the long-term effect of this therapy in a collective of over 100 patients over a duration of up to 4 years. Treatment efficacy is assessed using the established ESS questionnaire.



1340

Management of severe spontaneous epistaxis in a tertiary ENT center: our experience over the last decade

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Epistaxis and HHT 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

Purpose. To describe and compare the different treatments used to control severe spontaneous epistaxis in patients requiring hospitalization. **Methods.** A retrospective descriptive study of a case series of patients hospitalized for spontaneous epistaxis in La Paz University Hospital in Madrid between 2012 and 2022. **Results.** 191 patients were included, with a total of 207 episodes. 65% were male. The mean age was 67 years. The mean length of hospitalization was 5 days similar in patients managed conservatively and surgically. Initially, conservative management was performed in all cases with anterior nasal packing. 60% of cases required surgery to control the epistaxis. The most performed surgery was endoscopic sphenopalatine artery ligation, in 55% of cases. Ligation of the internal maxillary artery or ethmoidal artery was not required in any case. Arterial embolization was performed in only one case. The mean length of hospitalization prior to surgery was less than two days. No post-surgical complications were observed. **Conclusions.** Endoscopic nasal surgery is a safe and effective alternative for the control of severe epistaxis. There is a tendency in our center to perform early surgery on patients with epistaxis refractory to nasal packing. Arterial embolization can be avoided with adequate nasal endoscopic surgery.



1428

Management of epistaxis in hereditary haemorrhagic telangiectasia (HHT) patients using pulsed dye laser and the effect of withholding treatment during the COVID pandemic

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Epistaxis and HHT 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

Using a patient survey, pulsed dye laser (PDL) treatment of epistaxis for hereditary haemorrhagic telangiectasia (HHT) patients was evaluated. Due to the COVID pandemic, a natural experimental set-up allowed assessment of an enforced withdrawal of treatment. Thirty-four subjects identified as undergoing PDL for HHT-related epistaxis were surveyed to look at the effectiveness of PDL after initial referral and the effect of delay to treatment during COVID on epistaxis and the associated quality of life (QoL). The survey also examined the comparison to other available treatments. Retrospective pre-COVID Epistaxis Severity Scores (ESS) were compared to post-COVID data to assess the effect of treatment withdrawal. The patients were then followed up after resumption of their treatment to assess the ensuing change in ESS. After initial referral, frequency and severity of epistaxis decreased. Fifty-six percent of patients experienced several bleeds per day before treatment, compared to 12% after. 88% of patients had episodes of epistaxis longer than 5 min, which halved to 44% after treatment. Average ESS pre-COVID was 4.42 compared to 5.43 post-COVID ($p = 0.02$). On resumption of treatment, average ESS reduced to below pre-COVID levels at 4.39 after only 2 sessions. Seventy-six percent of patients found that withdrawal of PDL during COVID diminished their quality of life. PDL treatment of nasal mucosal telangiectasia reduces the frequency and duration of epistaxis. The ESS is reduced following treatment and QoL subjectively improved.

1477

Young's procedure for severe epistaxis in hereditary haemorrhagic telangiectasia

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Epistaxis and HHT 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

Introduction Hereditary haemorrhagic telangiectasia (HHT) is a rare genetic disorder characterised by the formation of widespread arterio-venous malformations. Involvement of the nasal mucosa results in recurrent severe epistaxis, significantly impacting on quality of life. Nasal closure is occasionally used to treat severe refractory epistaxis in HHT, but there is limited research on its outcomes. We aim to evaluate the efficacy and patient satisfaction of nasal closure in this context. **Methods** A case series of 5 patients with HHT and severe transfusion dependent epistaxis refractory to conventional management were treated with nasal closure between 2020 and 2022. Post-operative outcomes were measured using the Glasgow Benefit Inventory (GBI), epistaxis severity scale (ESS), haemoglobin concentrations and transfusion frequency. **Results** All patients had an improvement in ESS. Haemoglobin concentrations increased in all patients, with none requiring transfusion for epistaxis after the procedure. Four patients experienced a complete cessation in epistaxis. Four patients had significantly positive GBI scores following nasal closure. The one patient with limited improvement had the closure to prevent worsening of severe pulmonary hypertension by anaemia. **Conclusions** Nasal closure appears to be a safe and effective option for the management of epistaxis in patients with HHT. Treatment improved quality of life, reduced severity of epistaxis and increased haemoglobin concentrations. Larger controlled studies are required to confirm these findings and evaluate long-term outcomes.



1586

Epistaxis and Pregnancy in Women with HHT – A Retrospective Survey and Recommendations for Management from an Otorhinolaryngology Perspective

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Epistaxis and HHT 1 | Room 9 Olympic Hall - Level 0 | Wednesday 21/06/2023

Background: Heredity hemorrhagic telangiectasia (HHT) is a rare inherited condition leading to telangiectasia of the mucosa and skin as well as visceral arteriovenous malformations (AVMs). Via hormonal changes, modifications of the vascular bed and circulation promote complications during pregnancy and delivery. The aim of this study was to assess patients' awareness about the disease and its complications during pregnancy in order to develop management recommendations from an ENT point of view. **Methods:** Included in our survey were 46 female HHT patients. A 17- item questionnaire was used to analyze their knowledge of the disease and its pregnancy associated complications, the severity of epistaxis during their pregnancy and delivery and the need for better education. **Results:** 85% of the participating women didn't know about their disease during first pregnancy and none was aware about potential adverse events. 28 of the 46 respondents suffered from epistaxis during pregnancy. One-third of patients even reported increased nosebleeds during pregnancy. One-third (33%) of women with HHT would have found counseling helpful. **Conclusion:** Our study showed that the awareness on the disease and its adverse events before and during pregnancy during the last decades has been poor. Epistaxis during pregnancy is an issue for women with HHT that needs to be addressed. In the light of these facts, improving HHT diagnosis and information by treating physicians is an objective and women with HHT should be counseled professionally prior onset of pregnancy.



Miscellaneous 2

1158

Nasal Valve dysfunction : Classification and management

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Miscellaneous 2 | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Objectives: A key aspect of rhinoplasty is integrity of nasal valves area because of its fundamental role in patent nasal airway. furthermore, nasal obstruction is a dominant feature in patient with nasal valves dysfunction (NVD) which can be devastating outcome after rhinoplasty. **Methods:** Nonetheless, NVD has been widely investigated regarding their etiologies and management. However, it has been assumed that the anatomical complexity and interplay between its structures causing a confusion for a beginner surgeon to diagnose and treat NVD. This study was approved by the institutional review board of Chosun University Hospital, Gwangju, Korea (2022-11-005). **Results:** To date, the lack of consensus on nasal valve pathologies and corrective procedures has led to its underestimations during analysis and management. As result, we proposed a classification system based on its affected anatomical part, location, and their management. Thus, implementing a classification system for NVD will help guide the practice of rhinoplasty and introduce a more structured approach. **Conclusion:** This approach will prove useful in expanding our understanding of how important to locate the pathology of NVD and apply the most relevant management options, particularly for a beginner surgeons



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Usefulness of structural rhinoplasty using 3D Printed Polycaprolactone Plate in Asian

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Miscellaneous 2 | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Background: Tip plasty using a septal extension graft (SEG) is useful in the Asian population. However, complications such as decreased tip projection, infection, or deviation are noted post-surgery, and additional support using an SEG is often necessary. We aimed to transplant an additional 3D printed polycaprolactone (PCL) graft to the tip plasty using the SEG to reinforce the SEG. Methods: The study included 43 patients (20 males and 23 females; mean age, 28.7 years; range, 17–58 years) who received rhinoplasties using the SEG method combined with a 3D printed PCL graft from November 2016 to August 2017. The mean observation period was 14.8 months (range, 12–20 months). Results: Twenty-six patients rated their satisfaction level as excellent, 13 rated good, 3 rated fair, and 1 rated poor. In total, 28 patients did not exhibit tip drooping at the 1-year follow-up; 13 patients demonstrated mild to moderate tip drooping, and 2 patients demonstrated severe tip drooping. Thirty-one patients demonstrated “stiffness” of the nasal tip, of which 11 patients reported discomfort, and 20 patients reported none; two patients demonstrated deviation of the tip. Conclusion: Although the 3D-printed PCL graft provided support, biocompatibility, and manipulability, care is required to prevent complications.

**1213****Splitting advancement genioplasty, a long term follow-up and outcome****Muzaffer Çelik¹**¹*Cranioplast Clinic*

Miscellaneous 2 | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

A new genioplasty technique has been described and performed on more than 200 patients since 1996. The technique has been developed to avoid some undesired results of the current osseous genioplasty techniques and to achieve a more natural appearance in advancement genioplasty. According to the authors' technique, a rectangular part of the outer table of the mentum is split away from the mandible, and is advanced and fixated to the mandible. This technique can be used for advancement cases but not for reduction genioplasty. This technique was performed on more than 200 patients with only minor complications, including one case of wound dehiscence, one hematoma, and one case of osteomyelitis, which was managed with systemic antibiotic therapy. Aesthetic results were found to be satisfactory according to an evaluation by the authors. When the results were evaluated using pre- and postoperative photos, lip position and projection of the mentum were found to be natural in shape appearance. During the late postoperative period, the new bone formation between the advanced segment and the mandible was demonstrated radiographically. The new bone formation is also stable according to long term follow-up. Advantages of the technique include having more contact surfaces for bony healing, a natural position of the lower lip, more natural projection of the mentum, tridimensional movement of the mentum, and improvement in the soft tissue of the neck. The disadvantages of the technique are, manipulation problems during surgery, and possible mental nerve injury. Splitting advancement geniop



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Personalized Digital Technologies for Improved Late Zygomatic-Orbital-Skull-Base Reconstruction

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Miscellaneous 2 | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Introduction: We present a case with zygomatic-orbital-skull-base reconstruction using virtual planning (multi-spiral computed tomography and 3D modeling), computer-aided surgical simulation, and a patient-specific implant. It is the first complex case in the literature to get improved using various customized digital technologies. **Methods:** A 37-year-old man with a complex late zygomatic-orbital-maxillary deformity on the left side and cerebrospinal fluid rhinorrhea (CSF) was referred to our department and treated in two stages after examination and discussion. We performed CSF rhinorrhea repair and zygomatic-orbital-maxillary reconstruction with preoperative virtual surgical planning and patient-specific implant designing. Two months after the primary stage, we replaced the patient-specific implant with a customized, three-dimensional, and preformed titanium mesh during the second orbital-skull-base reconstruction and simultaneous right-sided facial nerve decompression. **Results:** The postoperative outcome was satisfactory, permitting functional and esthetic rehabilitation of the patient. Facial symmetry in patients was observed and improved after the final reconstruction. The patient could finely tune his fixational eye movements and retain normal visual acuity. No particular complications occurred. **Conclusion:** Personalized digital technologies to treat late zygomatic-orbital-skull-base deformities benefit avoiding the problematic issues of implant positioning and the development of complications during total orbital reconstruction, ensuring a markedly satisfactory outcome.



1460

Look Who's Back: Re-emergence of cocaine associated vasculitis in an Irish population

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Miscellaneous 2 | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Introduction: Ireland has seen a significant increase in cocaine use and its nasal complications in recent years, with cocaine prevalence increasing from 8.6% in 2008 to 30.2% in 2021. There has been a re-emergence of cocaine induced vasculitis, not seen clinically since the early 2000's when the addition of levasimole was recognised as a contributory factor. We wish to highlight this recent increase in cocaine induced vasculitis. Methods & Results: Four cases were evaluated where patients presented to our outpatient service complaining of sinusitis and rhinitis symptoms, however examination showed evidence of significant destruction and necrosis of internal nasal architecture. All patients had positive ANCA and anti-PT3 antibodies. Biopsies excluded a malignant process. One patient had an associated skin rash, night sweats and lymphadenopathy, and subsequently underwent a lymph node biopsy to exclude lymphoma. Conclusion: Increasing societal cocaine use has been reflected in our outpatient units, with associated vasculitis increasing. This patient cohort are often not forthcoming regarding recreational drug use, which proves challenging. Induced vasculitis is not exclusive to cocaine usage and includes a number of differentials including lymphoma; therefore, tissue diagnosis and rheumatology consultation are essential in the work up. 200 words (excluding titles)

1155

Adaptation and validation of the Hebrew version of the nasal obstruction symptom evaluation (NOSE) scale

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Miscellaneous 2 | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Purpose To adapt the Nasal Obstruction Scale Evaluation (NOSE) questionnaire to the Hebrew language (H-NOSE), and to assess its sensitivity and specificity. **Methods:** Prospective instrument validation study. The English NOSE questionnaire was translated into Hebrew and re-translated for translation validity. Surgical candidates completed the H-NOSE questionnaire before and after surgery for nasal obstruction. The same questionnaire was completed by healthy controls. Test-retest reliability was performed within a two-week interval. Psychometric properties (reliability, reproducibility, validity and responsiveness) were assessed by a test-retest procedure, internal consistency and correlation to the Hebrew Sino-Nasal Outcome Tool 22 (He-SNOT-22) and response sensitivity. **Results** 179 patients with nasal obstruction and 74 controls completed the questionnaire. The Alpha Cronbach score was 0.93 for internal consistency. The ROC-curve demonstrated high sensitivity and specificity (>0%) and AUV=0.97. There was no significant difference was found in test re-test reliability. The difference between the pre- and postoperative questionnaire scores was highly significant (13.9 ± 4.0 vs 3.2 ± 4.1 , respectively, $p < 0.001$), demonstrating the anticipated postoperative improvement in nasal obstruction symptoms. **Conclusion** The H-NOSE questionnaire demonstrated reliable internal consistency, sensitivity, specificity



1754

Psammomatoid Juvenile Ossifying Fibroma: An Endoscopic Endonasal, Transorbital and Transcaranucular Approach

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Miscellaneous 2 | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Background Psammomatoid juvenile ossifying fibroma (PJOF) is a benign pathology which has aggressive local growth leading to invasion of surrounding tissue and recurrence after surgical excision. It has also unique features in terms of age of onset, location and presentation. **Method** 14 year old girl presented with left sided facial pain and proptosis for a few days. A CT scan showed a large nasal mass and an MRI scan revealed an enhancing solid mass occupying the left nasal cavity and involvement of cribriform plate with dural enhancement. The mass extended to medial margin of left optic foramen as well as her frontal, maxillary and sphenoid sinus. She had biopsies and histology suggested PJOF. Therefore, the ENT, Neurosurgery and Ophthalmology team undertook a joint endonasal craniofacial resection with additional transorbital and transcaranucular approaches. Repair was with a Facia Lata overlay graft. Post-operatively, her vision function was intact and only had a little residual telecanthus and she is currently under surveillance. **Conclusion** The risk of recurrence and aggressive nature of these benign lesions require early detection and complete resection. We present this case to emphasise the importance of a multidisciplinary approach in-order to achieve good resection with excellent functional and cosmetic outcomes.



CRS – diagnosis and investigations 3

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The Microbiological Profile of Allergic Fungal Rhinosinusitis

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CRS – diagnosis and investigations 3 | Room 11 Hall 3.3 - Level 7 | Wednesday 21/06/2023

Background: Allergic Fungal Rhinosinusitis (AFS) is a severe phenotype of chronic rhinosinusitis (CRS). While fungal allergy and type 2 inflammation are considered central mechanisms, the direct and synergistic role of bacteria and fungus remains a key theory. Defining the AFS micro-environment can improve our understanding of this debilitating pathology. **Methods:** We undertook a cross-sectional study analysing the microbiome profile of 61 patients. Swabs were obtained from the middle meatus at the time of surgery. Fungal and bacterial DNA were extracted and underwent fungal ITS, 16S short read (V3-V4) and 16S long read sequencing. Utilising a QIIME2 bioinformatics pipeline, abundance and diversity metrics were established. **Results:** 61 participants represented the clinical subgroups: AFS(12); Fungal CRS(19); allergic mucin CRS(18); and CRS(12). Staphylococcus was the most abundant genus(40.78%) across the cohort and was highest in the fungal CRS group(53.1%). Streptococcus was significantly more abundant in AFS(35.5%) and Fungal CRS(25.8%) compared to the non-fungal groups (16.9% allergic mucin CRS; 4.17% CRS). There was a trend towards lower phylogenetic diversity in the fungal groups. Aspergillus was the dominant fungal genus on culture and ITS. **Conclusion:** A low diversity environment dominated by staphylococcus and streptococcus suggests a central role for these genera in AFS and fungal CRS. While the former is established in bacterial-fungal cross-kingdom super antigen theorem, the latter is a novel finding in this context and one that warrants further investigation.

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Does The Endotype Influence the Quality of Life in Chronic Rhinosinusitis Patients? Prospective Study

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CRS – diagnosis and investigations 3 | Room 11 Hall 3.3 - Level 7 | Wednesday 21/06/2023

Background: Based on the inflammation type, Chronic Rhinosinusitis (CRS) can be classified in type 2 and non-type 2 inflammation. Although type 2 inflammation is associated with a higher recurrence rate, it remains unclear the relationship between the endotype and quality of life in CRS patients. The Sino-Nasal Outcome Test-22 (SNOT-22) questionnaire is used to assess quality of life (QOL) in CRS patients. **Objective:** Evaluate if the inflammation type influences the QOL in CRS patients. **Materials and Methods:** A prospective study was conducted between January 2021 to December 2022. The included patients didn't receive any medical therapy (antibiotics, corticosteroids) two months prior to the medical appointment. The SNOT-22 questionnaire, IgE and blood eosinophils count was collected before medical therapy. Type 2 inflammation was defined by blood eosinophils count $\geq 250/\mu\text{L}$ and/or IgE level $\geq 100/\mu\text{L}$. **Results:** 141 CRS patients were included. Type 2 inflammation was presented in 64.5% of the sample. We found a positive correlation between SNOT-22 score and IgE level ($r=0.023$, $p=0.783$) and negative correlation between SNOT-22 score and blood eosinophils count ($r=-0.023$, $p=0.789$) none of them statistically significant. No association was found between the type of inflammation and the SNOT-22 score ($p=0.788$). **Conclusion:** Recent literature suggests that type 2 inflammation may induce a higher rate of recurrence when compared to non-type 2 inflammation. However, our results demonstrated that the inflammation type does not significantly influence the QOL in CRS patients.



1564

Aspirin provocation and desensitization in Samter's triad: a 25-patient series

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CRS – diagnosis and investigations 3 | Room 11 Hall 3.3 - Level 7 | Wednesday 21/06/2023

Introduction The trinity of recurring nasal polyps, bronchial asthma and aspirin intolerance characterize the Samter's triad (ST). ST is an underdiagnosed non-allergic hypersensitivity reaction associated with abnormal metabolism of arachidonic acid, which decreases prostaglandins and increases leukotriene synthesis. Patients present with symptoms of sinusitis and are frequently recipients of ESS. **Aim** We aim to trial aspirin desensitization therapy group of 25 patients. ST diagnosis was confirmed by positive aspirin provocation. **Materials and methods** 25 patients with suspected ST underwent immunophenotyping and diagnostic provocative aspirin challenge. All patients were administered a placebo and increasing doses of Aspirin from 30 to 600mg. Patient condition and resultant symptoms were monitored. Patients exhibiting severe hypersensitivity symptoms were assigned desensitization therapy with Aspirin 600mg daily. **Results** 25 patients were diagnosed with ST. 5 of these 25 patients exhibited severe symptoms. 16 patients were assigned desensitization therapy. After 12 months all patients reported better quality of life. Endoscopic examination confirmed no recurrence of nasal polyps. **Conclusion** Aspirin desensitization therapy improves quality of life but remains uncommon. Desensitization is a ready alternative to biological treatment. Desensitization doses are controversial and maintenance doses are also not standardized. A larger ST cohort should be studied to determine the effectiveness of threshold desensitization doses.

1672

Potential anti-inflammatory role of miR-143-3p in upper airway inflammation

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CRS – diagnosis and investigations 3 | Room 11 Hall 3.3 - Level 7 | Wednesday 21/06/2023

BACKGROUND: microRNAs (miRNAs) are described to be involved in the inflammatory response. However, their direct role in Chronic Rhinosinusitis with Nasal Polyps (CRSwNP) is still under investigation. This study aimed to study the expression and role of miR-143-3p in upper airway samples from CRSwNP patients and controls in regulating inflammation. **METHODS:** The localization of miR-143-3p in NP and NM samples was analyzed by miRNA scope. miR-143-3p expression was detected in nasal polyps (NP, n=49) and control nasal mucosa (NM, n=25) by using RT-qPCR and a ROC curve was calculated. Cytokines protein expression in tissue lysate from NP and NM was analyzed by ELISA assays. **RESULTS:** miR-143-3p expression was localized in the sub-epithelial area in both NM and NP tissues. In NP compared with NM, a significant downregulation ($p < 0.0001$) of miR-143-3p was observed. The ROC curve confirmed a high accuracy in discriminating NP from NM tissues (AUC: 0.94; 95% confidence interval 0.89 to 0.99). In NP compared with NM, IL-8 and Eotaxin were upregulated ($p < 0.001$ and $p < 0.0001$ respectively) while RANTES and GM-CSF were downregulated ($p < 0.001$ and $p < 0.0001$, respectively). **CONCLUSIONS:** miR-143-3p may play an anti-inflammatory effect in the regulation of upper airway inflammation.

1673

Expression of PAF receptors and Lyso-PAF isoforms in healthy and inflamed upper airway mucosa

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CRS – diagnosis and investigations 3 | Room 11 Hall 3.3 - Level 7 | Wednesday 21/06/2023

Background. The Platelet-Activating-Factor (PAF) and its receptor (PAF-r) are involved in anaphylaxis, asthma, and allergic rhinitis. However, no studies have investigated the expression of PAF-r and the Lyso-PAF isoforms in sinonasal tissue from chronic rhinosinusitis with nasal polyp (CRSwNP) patients. **Methods.** Tissues were obtained from controls (nasal mucosa, NM, n=6) and CRSwNP (NP, n=6), with asthma (NP-ATA, n=6) or with NSAID-exacerbated respiratory disease (NP-N-ERD, n=6). mRNA was analysed by RT-PCR, PAF-r proteins by western blot and immunofluorescence, and Lyso-PAF isoform concentration by mass-spectrometry. **Results.** 1) The PAF-r mRNA was up-regulated in NP (P<0.05), ATA-NP (P<0.05), and N-ERD-NP (P<0.05) vs NM while PAF-r proteins were detected in both NM and NP. 2) Lyso-PAF C16 was higher in NP (P<0.05), ATA-NP (P<0.05), and N-ERD-NP (P<0.05) vs NM. Lyso-PAF C16 was higher in asthmatic (both ATA and N-ERD) than in non-asthmatic NP (P<0.05). 3) Lyso-PAF C18:1 and C18 were higher in N-ERD-NP (P<0.05) and ATA-NP (P<0.05) vs NM. Lyso-PAF C18 was higher in ATA-NP and N-ERD-NP than in NP (P<0.05). **Conclusions.** PAF-r mRNA and protein expression was found in both NM and NP tissues. NP showed an over-expression of PAF-r mRNA and Lyso-PAF isoforms, suggesting that PAF/PAF-r system could play a pathophysiological role in CRSwNP.

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Anatomical variations of the internal carotid artery involved in endoscopic sinus surgery

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CRS – diagnosis and investigations 3 | Room 11 Hall 3.3 - Level 7 | Wednesday 21/06/2023

FESS has become a well-established standard treatment for recurrent chronic sinusitis. In the assessment of lesions, modern imaging techniques, such as CT scan play a vital role in facilitating an adequate therapeutic plan. Moreover, these techniques offer guidance for endoscopic interventions in risky regions, thereby decreasing surgical risks and enhancing the efficacy of the intervention. **Material and Method.** The present study describes a retrospective analysis of 50 cases that were surgically treated at the ENT department of "Sf. Spiridon" Clinical Emergency Hospital Iasi, between 2020 and 2022. The paraclinical investigation involved acquiring measurements and interpreting a range of CT images regarding the anatomical variations of the internal carotid artery and its relationships with other structures, which serve as landmarks in FESS. **Results and Discussions.** The study placed particular emphasis on the pneumatization types of the sphenoid sinus, with special attention paid to hyperpneumatization, since these variations can alter the conventional relations among the diverse anatomical structures, including the anatomical variations of the optic nerve and internal carotid artery. The imaging study revealed various topographic aspects, which were extensively presented. **Conclusions.** This study examines the anatomical variations of the sphenoid sinus with a focus on the key anatomical landmarks, namely the internal carotid artery and optic canal. This preoperative plan helps in reducing complications and allows a safe and effective surgical intervention.

1712**Contemporary review of the Bent and Kuhn Criteria****James Connell¹**¹*Department of Otorhinolaryngology, Queen Elizabeth Hospital, South Australia*

CRS – diagnosis and investigations 3 | Room 11 Hall 3.3 - Level 7 | Wednesday 21/06/2023

Background: Allergic Fungal Sinus Rhinosinusitis (AFS) is a distinct clinical entity with severe clinical manifestations. The Bent and Kuhn Criteria for AFS have served as a diagnostic mainstay since their first description. As we enter an era of defined CRS phenotypes, we review the ongoing applicability of the major and minor criteria. Methods: We performed a cross sectional series of 149 patients suspected to have AFS based on the presence of eosinophilic mucin, nasal polyposis and characteristic CT findings. We collated extensive patient data including demographics, clinical, microbiological and tissue analysis. Results: Out of 149 patients, only 19 (12.8%) met all criteria required for AFS. 62 patients better fit the distinct clinical entity, eosinophilic mucin CRS. The remaining 68 patients had highly comparable disease severity, minor criteria, radiological changes and microbiological results to the AFS but failed to meet all five diagnostic criteria. Negative fungal stains (despite positive fungal cultures) and incomplete or negative fungal allergy testing (despite positive fungal stains) were the primary reasons for incomplete diagnosis. Conclusion: A number of patients that clinically and microbiologically behave similarly to AFS fail to meet all diagnostic criteria, which may represent a distinct pathological group or limitations of the criteria. As we progress into an era where diagnosis may dictate treatment, further insights to optimise diagnostics become critical. In depth bio-informatics may enhance our understanding of the AFS disease phenotype.



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Infectious and rheumatic diseases manifesting as orbital sinusitis complications – case reports.

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CRS – diagnosis and investigations 3 | Room 11 Hall 3.3 - Level 7 | Wednesday 21/06/2023

Introduction Sjögren's syndrome (SS) is a chronic autoimmune disease of unknown etiology. It predominantly affects middle-aged females and manifests itself mainly as keratoconjunctivitis sicca, and xerostomia. On the other hand erysipelas is a skin disease caused by bacterial infection, usually by Streptococcae. Both of these conditions can lead to swelling, tissue redness and pain. The presence of these symptoms in specific locations can mislead a clinician and suggest incorrect diagnosis. We present 2 cases of patients admitted with symptoms suggestive of orbital sinusitis complications that turned out to be manifestations of SS and erysipelas. Material and methods We present 2 cases of patients both primarily treated as complicated chronic rhinosinusitis (CRS). During the diagnostics it came out that in the first case we were dealing with SS and in the second case with the bacterial infection - erysipelas. Symptoms of orbital complications were masking infectious and autoimmune disorders. Conclusion Autoimmune and infectious disorders can present themselves in a form suggesting various diseases. A clinician should always implement differential diagnosis in questionable situations, especially after unsuccessful surgical intervention it preformed to rule out any underlying reasons of persistent CRS symptoms.

Sinonasal malignancy 2

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Pterygopalatine Fossa And Orbital Apex May Be Predictors Of Distant Metastatic Disease: A Retrospective Cohort Study of Sinonasal Intestinal-type Adenocarcinoma

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Sinonasal malignancy 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Introduction Intestinal-type adenocarcinoma (ITAC) is an aggressive subtype of sinonasal neoplasms. The objective is to characterize the population of patients with ITAC and identify relevant structures regarding distant metastasis. **Methods** A retrospective cohort of patients diagnosed with ITAC from January 2010 to December 2022 was performed in a tertiary center. **Results** Twenty-five patients, all male, and the average duration of follow-up was 37.6 (\pm 27.4) months. Twenty (80%) patients were exposed to wood dust. T3/T4 cancer accounts for 20 (80%) of cases. Endoscopic sinus surgery was performed in 13 (56.5%) cases and 10 (43.5%) patients underwent a combined approach of endoscopic and craniofacial resection. Negative margins were achieved in 14 (60.9%) cases. During the postoperative follow-up, 10 recurrences (43.5%) were detected after a mean interval of 24.5 months. All 4 patients with distant metastatic disease had involvement of the orbital apex and pterygopalatine fossa. None of the patients recurred with nodal metastasis. The median overall survival was 78 months, and the 5-year survival rate was 51.4%. **Conclusion** Occupational exposure to wood dust may act as a important risk factor, commonly seen in the northern region of Portugal. Without nodal involvement, M+ disease implies non-lymphoid route spread, maybe via the orbital apex and pterygopalatine fossa.

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Poorly-differentiated sinonasal carcinomas: study of the genetic and epigenetic fingerprints.

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Introduction. Poorly differentiated sinonasal cancers (PDSNCs) are high grade aggressive neoplasms; they include: poorly differentiated SCC, sinonasal undifferentiated and neuroendocrine carcinoma. PDSNCs have undergone a significant refinement of their subtyping from a genetic point of view, with the identification of new novel molecular subgroups: NUT carcinoma, IDH2-mutated carcinoma, and SWI/SNF complex deficient malignancies. PDSNCs are treated with a multimodal treatment protocol. **Materials and methods.** A retrospective review of patients affected by PDSNCs treated in a single Italian tertiary care referral centre (2008-2018) was performed. Patients were investigated from a histological, genetic/epigenetic and survival point of view. **Results.** 53 patients were enrolled (33 SCC G3, 6 SNUCS and 14 SNEC). 9 cases showed loss of INI1 expression (7 cases homozygous deletion); 5 cases showed IDH2 hotspot mutation in codon p.Arg172 (mutually exclusive with INI1 deficiency); 13 cases had hypermethylated LINE-1 sequences. 5-years DSS was 55.9%. Histotype, INI1-loss, IDH2 mutation, LINE-1 hypermethylation, and occupational exposure were significant prognostic factors. **Conclusions.** INI1-deficient and IDH2-mutated tumors are aggressive diseases. IDH2 mutation and INI1 loss were associated with hypermethylated LINE-1. The combined analysis of LINE-1, INI-1 and IDH2 alterations define a distinct molecular subset of PDSNCs characterized by an aggressive biologic behavior and potentially targets for innovative biological therapies.



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Acinic cell carcinoma of the Nasal Cavity: A systematic review of the literature

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Sinonasal malignancy 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Introduction: Acinic cell carcinoma (ACC) is a rare malignant tumour, constituting 1% of salivary gland neoplasms. It appears predominately in the parotid gland, whereas its occurrence in different locations is unusual. The aim of this study is to review the available evidence regarding the prevalence, diagnosis and management of ACC of the nasal cavity. **Methods and Material:** This was a systematic review of the current literature concerning ACC of the nasal cavity, which was conducted according to the PRISMA Protocol. An electronic search of the English-language literature was performed through Pubmed/Medline, Scopus and Embase databases. Case reports, case series and cohort studies were considered eligible. **Results:** Eighteen studies, with 39 patients (mean age:32.0 years) were included in the review. No predominance between sexes was observed. ACC mainly arose at the lateral and inferior wall of the nasal cavity (29.7%), the ethmoid sinuses (21.6%) and the maxillary sinus (21.6%). Surgical treatment was chosen for all the patients, followed by radiotherapy in 60% of them. A recurrence was noticed in 3 cases and the overall survival approached 96.2%. **Conclusion:** Sinonasal acinic cell carcinoma is a rare entity that otolaryngologists should be aware of, in order for the adequate management to be accomplished.



1700

The role of inverted papilloma as a prognostic factor in sinonasal squamous cell carcinoma

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Introduction: Inverted papilloma (IP) is a benign tumor that has high recurrence rates and the potential for malignant transformation into squamous cell carcinomas (SCC). IP has been described in as a prognostic factor for sinonasal squamous cell carcinoma (SCC), and some authors report that its presence is associated with better prognosis. The aim of this study is to compare the response to therapy, recurrence, and survival rates between patients with sinonasal SCC with history of IP with those without IP. **Methods:** Retrospective study with review of records of patients with a diagnosis of sinonasal SCC between 2007 to 2019 in a reference oncology center. **Results:** A total of 78 patients were selected for the study. IP was present in 11 patients (14,1%), either at the time of SCC diagnosis or prior to this. Most patients were in stage III or higher. Age, recurrence or persistent disease after initial treatment were not statistically different between IP and non-IP groups. Overall survival was statistically higher in the IP group. **Discussion/conclusion:** Sinonasal SCC often present in an advanced stage and this is one of the factors for poor prognosis. Our findings support IP as another potential marker for prognosis in sinonasal SCC.

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Metastatic tumours to the Nasal Cavities, Paranasal Sinuses, and Orbit: a single-institution 20-year experience

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Rationale: Extra nasal cancers that metastasize to the paranasal sinuses are utmost rare. Due to their uncommon occurrence, literature is scant regarding their prognosis and management. The purpose of this study is to analyze clinical, therapeutical and survival data of such rare pathology. **Material and Methods:** A retrospective review of all the patients affected by metastatic cancers to the sinonasal and orbital region from 2000 to 2020 in a tertiary-care referral University Hospital was performed. Demographic information, clinical presentation, treatment modalities and survival outcomes were investigated and collected for each patient. **Results:** A total of 20 patients (14 males, 6 females), aged between 32 and 79 years, were included. The most common primary tumor site spreading to sinonasal and orbital region was renal cell carcinoma (6 cases) followed by lung cancer (3 cases), breast and colon carcinoma (2 cases), and hepatocarcinoma, thyroid carcinoma, oropharyngeal carcinoma, skin melanoma, prostate cancer, parotid adenoid cystic carcinoma, bone sarcoma (one case, each). Four patients underwent biopsy for histological diagnosis, while in 16/20 cases surgical resection was performed. The 2-year survival rate was 63±2%. **Conclusions:** Even if rare events, paranasal sinus and orbital localization of distant cancers might occur, and it should be suspected in patients with previous history of malignancy. Although the overall survival remains poor in the setting of a metastatic disease, early diagnosis and prompt treatment can improve patients' quality of life and, occasionally



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ADULT SINONASAL ALVEOLAR RHABDOMYOSARCOMA: CASE REPORT AND LITERATURE REVIEW

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Sinonasal malignancy 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Introduction: Alveolar rhabdomyosarcoma (ARMS) is a rare soft-tissue malignancy that mainly affects children and adolescents, frequently misdiagnosed in the head and neck region. **Objectives:** To report a case and to review the literature on sinonasal ARMS. **Case Report:** A 34-year-old female presented with two seizures and bilateral proptosis. Imaging studies reported a mass in the right nasal cavity extended to the left nasal cavity, paranasal sinuses, orbits and anterior skull base. The patient underwent combined nasal endoscopic and subfrontal craniotomy for lesion resection. The immunohistochemical diagnosis of alveolar rhabdomyosarcoma was made. Molecular analysis was positive for PAX/FOXO1 fusion gene. Three weeks after surgery, the patient presented with left arm paresthesia and dorsal backpain. Imaging studies revealed tumor recurrence with spinal metastases. Palliative radiotherapy for spinal cord compression was started, followed by ongoing chemotherapy. **Discussion:** Sinonasal ARMS has a wide spectrum of presentation, from localized nasal to ophtalmic and neurologic symptoms. The diagnosis is based on histopathology and molecular analysis. Poor prognosis factors include age, intracranial extension, alveolar subtype and metastasis. ARMS warrants a multidisciplinary treatment approach with chemotherapy, radiation and surgery if permitted by anatomical site. **Conclusion:** Early diagnosis and prompt treatment for sinonasal ARMS are crucial for outcome.

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Pediatric Sino-orbital Rhabdomyosarcoma: A Case Report and Literature Review

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Sinonasal malignancy 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Rhabdomyosarcomas are aggressive and rare soft tissue malignancies, that frequently affect the nose, paranasal sinuses and nasopharynx. Notwithstanding their rarity, rhabdomyosarcomas are the most common pediatric soft tissue malignancies of the head and neck. We describe a 15-year-old girl who presented with sudden right-sided gaze diplopia, right-sided exoftalmia, right-sided nasal obstruction and right-sided temporoparietal headache, from 9 days before presentation. Magnetic resonance imaging described a large right sinonasal mass, with right intraorbital extension. Histopathologic examination revealed a diagnosis of embryonal-type rhabdomyosarcoma. The sinonasal and orbital mass was resected through an endoscopic endonasal approach, with the restoration of visual function. The patient received adjuvant chemotherapy and radiotherapy after surgery. Endoscopic examination and magnetic resonance imaging showed complete regression of the tumor 1 year after her first hospital presentation. We provide a literature review of pediatric sinonasal rhabdomyosarcomas with multiple manifestations. Despite the poor prognosis of large parameningeal rhabdomyosarcomas in children, patients with embryonal histology have a more favorable prognosis than those with alveolar histology. Aggressive and early treatment, including surgery, radiotherapy and chemotherapy, may increase local remission rates and lead to a better prognosis.



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Biphenotypic Sinonasal Sarcoma – A Case Report

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Sinonasal malignancy 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Background: Biphenotypic sinonasal sarcoma (BSNS) is a rare, low-grade malignant, soft-tissue sarcoma of the sinonasal cavity. It has only been recognised in the WHO of head and neck tumours in 2012. BSNS display both myogenic and neural differentiation making them unique to other mesenchymal lesions and only 4 case series have been reported in the literature. **Clinical Case:** A 35 years old male was referred urgently to the ENT clinic with a 6 month history of left-sided nasal blockage despite oral or topical steroids treatment. There was no other concerning symptoms. Examination revealed a pedunculated mass filling most of the left nasal cavity. MRI scan showed a 45mm left sided nasal cavity mass abutting the left cribriform plate. Endoscopic biopsy confirmed the diagnosis of BSNS. Immunohistochemistry was positive for SMA, Bcl2 and vimentin. PAX3-MAML3 fusion was detected. The patient underwent a unilateral endonasal craniofacial resection. The 3-month post-operative MRI scan showed no residual disease or recurrence. **Conclusions:** The paucity of cases in the literature highlights the rarity of this new entity and therefore we publish this case to consider BSNS as an important differential in sinonasal tumours and highlight the importance of immunohistochemistry markers for its diagnosis.

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Neck node metastasis in sinonasal malignant tumor

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Sinonasal malignancy 2 | Room 7 Hall 10 - Level 8 | Wednesday 21/06/2023

Sinonasal tumors are rare and heterogeneous diseases with a low incidence of neck node metastasis. This study aims to analyze the risk of neck nodes recurrences, the corresponding clinical results and to study any biological markers that could predict the regional spread of sinonasal malignant tumor. A total of 718 patients affected by a sinonasal malignant tumor were included. Twenty-one patients presented regional disease at presentation (3%); 35 patients experienced lymph node relapse during follow-up (4.6%). Histotypes involved were squamous cell carcinoma (14/137, 10.2%), mucosal melanoma (7/58, 12%), intestinal type adenocarcinoma (6/207, 2.9%), adenoid cystic carcinoma (6/53, 11.3%), olfactory neuroblastoma (5/74, 6.75%), neuroendocrine carcinoma (5/23, 21.7%), sinonasal undifferentiated carcinoma (3/13, 23%), mucoepidermoid carcinoma (1/3, 33.3%), salivary duct carcinoma (3/12, 25%), high grade adenocarcinoma (1/17, 5.9%), INI1-deficient sinonasal carcinoma (1/2, 50%), HPV-related multiphenotypic sinonasal carcinoma (1/4, 25%). Neck nodes metastases are rare but possible, so it is important to identify them during follow-up. Poorly differentiated epithelial tumors have an early and high risk of neck node recurrence; olfactory neuroblastoma, otherwise, has a low risk of recurrence but regional spread can occur even after several years and therefore an adequate and long follow-up is essential.

CRS – medical management 5

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Predictors of outcome in type 2 CRS patients treated with dupilumab

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CRS – medical management 5 | Room 8 Hall 4 - Level 0 | Wednesday 21/06/2023

Background: Type 2 chronic rhinosinusitis (T2CRS) may present with and without nasal polyps. Some cases might be difficult to treat despite receiving multiple operations and topical as well as systemic steroids. In these patients biological treatment is a promising option. However, so far there are no predictive markers to identify responders before such an expensive treatment. **Methods:** T2CRS patients starting dupilumab treatment were enrolled in a retrospective study. The aim was to assess ultra short term and short term follow-up using clinical scores and markers. Blood samples were drawn at given intervals and proteomic analysis was performed using Olink®. The aim of the study was to identify clinical and serologic predictive markers of dupilumab response. **Results:** We included 30 patients with 80% being treatment responders. Ultra rapid response was observed already on day 7 after treatment initiation. For those showing rapid improvement of symptoms (SNOT-20 score) and polyp scores a sustainable improvement was demonstrated. This factor was highly predictive with a sensitivity of 86%. Proteomic analysis identified two dysregulated proteins before treatment, that could predict positive outcome. To confirm this finding a new prospective cohort was formed and the test reperfomed. Osteoprotegrin (OPG) was confirmed as a serologic predictor of positive outcome. **Conclusion:** One week of treatment is sufficient to predict outcome of dupilumab treated T2CRS patients. Olink proteomics identified OPG as a predictive serologic marker in dupilumab treatment.

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Dupilumab increases aspirin tolerance in NSAID-exacerbated respiratory disease (N-ERD)

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Non-steroidal anti-inflammatory drug (NSAID)-exacerbated respiratory disease (N-ERD) comprises the triad of chronic rhinosinusitis with nasal polyps, asthma, and intolerance to NSAIDs. Dupilumab treatment significantly reduces polyp burden and asthma symptoms. Here we aimed to investigate the effect of dupilumab on aspirin intolerance, burden of disease, as well as on nasal cytokine profiles in patients suffering from N-ERD. Patients with confirmed N-ERD were treated with dupilumab for six months. Clinical parameters, oral aspirin provocation testing, blood, nasal and urine sampling were monitored up to six months after starting dupilumab therapy at regular intervals. After six months of treatment, 23.3% (n=7/30) of patients developed complete aspirin tolerance and an additional 33.3% of patients (n=10/30) tolerated higher doses. Polyp burden was significantly reduced (total polyp score: -2.68 ± 1.84 , $p < 0.001$) and pulmonary symptoms (asthma control test: $+2.34 \pm 3.67$, $p < 0.001$), as well as olfactory performance improved (UPSIT: $+11.16 \pm 9.54$, $p < 0.001$) in all patients after therapy. Patients with increased aspirin tolerance showed a significant decrease in urine leukotriene E4 levels and their improvement in clinical parameters was associated with the reduction of eotaxin-1, CCL17, IL-5, IL-17A and IL-6. 57% of N-ERD patients tolerated higher doses of aspirin under dupilumab therapy.



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Evaluation of the efficacy and safety of nasal pulse nebulization of hormones in promoting mucosal recovery after nasal endoscopic sinus surgery

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To investigate the efficacy and safety of using nasal pulse nebulized budesonide in patients after functional nasal endoscopy (FESS). A total of 40 patients with chronic sinusitis who underwent FESS in our hospital were randomly divided into nebulized inhalation group (n=20) and oral hormone group (n=20) using a random number, all patients received the same postoperative routine treatment, both groups of patients were followed up in our hospital outpatient clinic after 2 weeks, after cleaning up the nasal tamponade material on the 14th postoperative day, the nebulization group began to nebulize inhalation budesonide suspension, and the other group took methylprednisolone tablets orally, both for 2 weeks. Visual analogue scores (VAS) and Lund-Kennedy endoscopic scores for nasal symptoms (nasal congestion, runny nose, smell, headache) were performed before and after treatment to assess safety by adverse events and morning serum glucocorticoid levels. Results: After 12 weeks of follow-up treatment, 2 cases were dropped in the oral hormone group, and the VAS visual analogue score of the 2 groups was significantly reduced, and the Lund-Kennedy endoscopic score of the nebulized group and the oral group was also significantly reduced, the morning serum glucocorticoid concentration in the nebulized group decreased after treatment, but there was no significant statistical difference, while the morning serum glucocorticoid concentration in the oral group was significantly reduced after treatment, and obvious corticosteroid suppression was visible.

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The Role Of Vitamin D3 Supplementation In The Treatment Of Chronic Rhinosinusitis With Nasal Polyposis

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Background: Recent evidence suggested the anti-inflammatory and immune modulator effect of Vitamin D3 (VD3) and the relation between vitamin D deficiency and chronic rhinosinusitis with nasal polyposis. **Aim:** Our study aims to determine the anti-inflammatory effect of VD3 supplementation clinically and histologically. Furthermore, investigate its relation to immunohistochemical tissue expression of basic Fibroblast Growth Factor (bFGF). **Methodology:** A prospective study based on seventy patients divided into two groups: Group I (50 patients with CRSwNP) and group II (20 control). Group I was subdivided into (Ia), which received vitamin D (VD) 50000 IU/Week and group (Ib), which received local and oral steroids. Before and after treatment, Group Ia & Ib were assessed clinically using SNOT-22 and Lund & Kennedy's scores. Also, Nasal biopsies were taken for histological examination and immunohistochemical detection of bFGF (basic fibroblast Growth Factor) expression. **Results:** There was mild clinical improvement with VD supplementation. However, After VD supplementation the changes in bFGF expression in stromal cells were statistical insignificant. **Conclusion:** Clinical improvement was noted by history and examination after VD supplementation; however, group Ib (steroids supplemented) demonstrated a better response. Histopathological results revealed improvement in the total inflammation score, while immunohistochemical expression of basic fibroblast growth factor decreased more in response to VD3 than to steroids. More research is required to prove the therapeutic rule of VD.

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Sustained co-release of ciprofloxacin and dexamethasone in rabbit maxillary sinus using polyvinyl alcohol-based hydrogel microparticle

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Background: Topical drug delivery to paranasal sinuses through sustained release stents is a new horizon in the treatment of chronic rhinosinusitis (CRS). This animal study aims to introduce a new sustained release hydrogel and evaluate its efficacy and safety. **Material and Method:** Both DEX and CIP were encapsulated in tyramine-substituted polyvinyl alcohol (PVATyr) microparticles. The controlled release of DEX/CIP from microparticles was evaluated in the maxillary sinus mucosa and the blood samples of 12 rabbits. Nasal endoscopy, imaging, and respiratory and olfactory epithelium histological exams were conducted to track the changes. **Results:** A sustained release of DEX/CIP up to 28 days was observed in vivo. The DEX and CIP tissue concentrations remained within the therapeutic window on days 7, 14, and 28. At 28 days, tissue and blood concentrations were $>4\mu\text{g/kg}$ and $0.22\mu\text{g/L}$ for DEX, and $>\mu\text{g/kg}$ and $2.3\mu\text{g/L}$ for CIP, respectively. No prominent pathologic mucosal changes were detected in endoscopy, imaging, or histological examinations. **Conclusion:** The DEX/CIP loaded PVATyr MPs provided effective, safe, and controlled sustained release drug delivery in the in vivo analyses, at quite suitable concentrations compared to the systemic route, introducing a unique therapeutic strategy for CRS.



1668

USE OF NEW BIOLOGICAL THERAPIES IN PATIENTS WITH UNCONTROLLED CHRONIC RHINOSINUSITIS

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López González Nuria, Maza Solano Juan Manuel, Vizcarra Melgar Julissa Aida, Martín Jiménez Daniel Iván, Moreno Luna Ramón, González García Jaime, Sánchez Gómez Serafín. Background: Therapeutic protocols and multidisciplinary teams for Chronic Rhinosinusitis (CRS) and comorbid asthma have been enriched by the appearance of new monoclonal antibodies (mAbs) used in non-responding patients to conventional treatment. Our study aimed to analyze the results of implementing mAbs in patients with CRS with Nasal Polyps (CRSwNP) in our institution. Methods: An observational retrospective study of patients with CRSwNP and asthma treated with mAbs (Omalizumab, Mepolizumab, Benralizumab, and Dupilumab) was carried out in the Rhinology Unit of a tertiary referral hospital. Demographic, laboratory, clinical, and quality of life variables were analyzed. Results: Eighty patients treated with mAbs were included, with a mean age of 57,2. Sixty-three were treated with anti-IL5, eleven with anti-IgE, and six with anti-IL4/IL13. Statistically significant improvements in quality of life evaluated by SNOT-22 questionnaire ($p < 0.001$), in VAS score and in asthma control (Asthma Control Test) were found after the use of mAbs. The majority (69%) of patients obtained an improvement of the minimum clinically significant difference (MCID) in the SNOT-22 after one year of treatment. Conclusions: The use of mAbs has allowed patients with poorly controlled CRS and comorbid moderate-severe asthma to obtain a significant improvement in their nasal symptoms and quality of life.

1682

Management of patients with chronic rhinosinusitis and nasal polyps a 10 years retrospective study in ENT clinic of Timisoara

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Introduction:Chronic rhinosinusitis is prevalent in general population and lowers quality of life and increases the use of medical services. Chronic rhinosinusitis may be accompanied by an infection or blockage of the sinus outflow. Nasal polyps are frequently present along with chronic rhinosinusitis, which has a complicated etiology.**Materials and Methods:**We analyzed the patient files of 1172 patients admitted to the ENT Clinic with chronic rhinosinusitis and nasal polyps over a 10-year period.The following parameters were evaluated: age, gender, provenience, associated comorbidities and particularly, the treatment method and outcome.**Results:**Of the total patients evaluated, 60% cases were men and 40% women, The main Treatment methods include endoscopic polypectomy and sinus antrostomy.The outcome was and is debatable because is a chronic pathology and many of them came back for another intervention.One of most frequent pathology associated was bronsic asthma**Conclusions:**In addition to the increased prevalence of this pathology, managing patients with chronic rhinosinusitis and nasal polyps continues to be a top concern for ENT doctors due to their complexity and, in particular, their associated comorbidities.



1696

The role of sustained blood eosinophil count elevations in patients treated with dupilumab for CRSwNP

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BACKGROUND: Dupilumab, an IL4-/IL-13-inhibitor, leads to mostly transient blood eosinophil count (BEC) elevations. **OBJECTIVE:** To assess the impact of sustained BEC elevations after 12 months of dupilumab treatment for CRSwNP. **METHODS:** We retrospectively studied 41 subjects treated with dupilumab for CRSwNP. For our statistical analysis, we used ANOVA-type tests, Wilcoxon test and penalized logistic regression analysis. **RESULTS:** Median BECs increased from 0.44 (IQR 0.30) giga/L at baseline to 0.73 (IQR 0.91; $p=0.004$) at month 3 and were 0.50 (IQR 0.68; $p=0.56$) at month 12. The proportion of patients with elevated BECs ≥ 0.6 giga/L at month 12 was higher than at baseline (42.1 vs. 19.5%; $p<0.05$). Comparing effectiveness and safety in patients with BECs <0.6 and ≥ 0.6 giga/L at month 12, we found that patients with BECs ≥ 0.6 had higher NPS ($p<0.05$) and lower SSIT-12 scores ($p<0.05$), while SNOT-22 total scores and treatment-emergent events were not significantly different. Penalized logistic regression analysis showed that BECs at baseline (OR= 89.89) and the presence of NERD (OR=7.01) predict 12-month BECs ≥ 0.6 giga/L. **CONCLUSIONS:** Sustained BECs elevations may negatively affect NPS and SSIT-12 outcomes in patients receiving dupilumab for CRSwNP. Baseline BECs and presence of NERD could predict sustained BEC elevations.



1714

Exploration of the Efficacy and Safety of Intranasal Pulse Steroid Inhalation After Nasal Endoscopic Surgery

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Objective: To evaluate the safety and efficacy of intranasal pulse steroid inhalation in patients undergoing functional endoscopic sinus surgery (FESS). **Methods:** 40 patients with chronic sinusitis undergoing FESS at our center were randomly divided into an intranasal budesonide inhalation group (n=20) and an oral steroid group (n=20) using a random number generator. All patients received the same postoperative routine treatment and were followed up in the outpatient clinic 2 weeks after surgery. After removing nasal packing materials on postoperative day 14, the intranasal group began inhaling budesonide suspension through a nebulizer, while the other group took oral prednisone tablets for 2 weeks. The visual analog scale (VAS) was used to evaluate nasal symptoms (nasal obstruction, rhinorrhea, anosmia, and headache), and the Lund-Kennedy endoscopic score was used to evaluate efficacy. Adverse events and morning serum cortisol levels were used to assess safety. **Results:** Both groups showed significant improvements in VAS scores and Lund-Kennedy endoscopic scores compared to baseline. After treatment, the intranasal group had a decrease in morning serum cortisol concentration, but there was no statistically significant difference. However, the oral steroid group had a significant decrease in morning serum cortisol concentration, indicating a significant inhibitory effect on the hypothalamic-pituitary-adrenal axis. **Conclusion:** Compared to traditional oral steroid therapy, intranasal pulse steroid inhalation can better promote benign mucosal transformation and is safer.



1746

Comparison of intranasal medication delivery devices before and after functional endoscopic sinus surgery (FESS) using Phacon© sinus surgery models

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Introduction: Functional endoscopic sinus surgery (FESS) in the context of chronic rhinosinusitis (CRS) aims to improve both sinus drainage and medication delivery in the nasal cavity. Our study, aims to compare medication distribution between different delivery methods used in clinical practice in normal and altered anatomy (post-FESS) using sinus surgery models (PHACONÓ). **Methods:** To simulate medication, dye was delivered using nasal drops nasal spray and an irrigation device (NeilmedÓ Sinus rinseÓ). The dye was initially delivered in a normal (non-operated) model and subsequently in an operated (post-FESS) model that has undergone slightly different operations on either side. Endoscopic pictures were taken at various sites and the percentage of the total area covered in dye was calculated using computer software. **Results and Discussion:** NeilmedÓ Sinus rinseÓ generally provided the best distribution for most sites in both the normal and operated models, followed by nasal spray. Also, altering head position (lying down) improved delivery of the drops in the sphenoid sinus ($p=0.33$). The nasal spray did not appear to reach the sphenoid cavity if sphenoidotomy is performed without connecting to the posterior ethmoid cells. Finally, following DRAF 3 surgery, all 3 methods appear to deliver dye in the frontal sinus.



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The importance of preoperativ CT in endoscopic sinus surgery - key points for young surgeons

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INTRODUCTION The preoperative high-resolution sinus computed tomography (CT) scan is considered the roadmap of the surgeon, as it not only serves as a diagnostic imaging technique but also provides valuable information about the origin, nature, and extent of the pathology and its relationship to surrounding structures. It plays a crucial role in endoscopic sinus surgery as it provides important information such as the type that can help guide the surgical plan and improve surgical outcomes. **OBJECTIVE** Analyzing and identifying different structures on the sinus CT scan, such as sinus anatomy, abnormalities, relationships to surrounding structures, anatomic variations, blood supply in the sinus area, and density of the sinus tissue. In addition to knowledge and experience, the identification of potentially dangerous anatomical features, such as the depth of the frontal skull base or the course and bony coverage of the optic nerve and internal carotid artery, is crucial and mandatory in order to minimize the risks associated with the surgery. **CONCLUSION** Young surgeons must be familiar with this tool and not rely only on the interpretation given by the radiologist in order to avoid intraoperative complications and achieve successful surgical outcomes.

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OBJECTIVE DIAGNOSIS OF INTERNAL NASAL VALVE COLLAPSE BY 4-PHASE RHINOMANOMETRY

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Internal valve collapse (IVC) is a frequent cause of nasal obstruction but remains poorly understood and is sometimes treated inappropriately. The reference diagnostic technique is physical examination. The objective of this study was to evaluate the potential of 4-phase rhinomanometry (4P-RNM) as a diagnostic test for IVC. In a case-control diagnostic accuracy study, the nostrils of adult patients consulting for chronic nasal obstruction were classified as "collapsed" or "non-collapsed" based on clinical findings. 4P-RNM was performed in all patients. The area defined by the path of the flow/pressure curve in the two phases of inspiration (the "inspiratory loop area" or "hysteresis loop area") was calculated for both nasal cavities and the threshold value with the highest Youden index was identified. 66 patients (132 nostrils) were included with 72 nostrils classified as collapsed and 60 as non-collapsed. Before nasal decongestion, the inspiratory loop area with the highest Youden index was 17.3 Pa·L·s⁻¹ and the corresponding sensitivity and specificity were 88.3% [95% confidence interval, 80.0–95.0%] and 89.9% [82.6–95.7%] respectively. In these patients, a cutoff inspiratory loop area in 4-phase rhinomanometry data reproduced clinical diagnoses of internal valve collapse with high sensitivity and specificity.



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Preoperative Computed-Tomography for Endoscopic Sinus Surgery: A Simplified Checklist

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Introduction: Endoscopic sinus surgery gained growing popularity with indications expanding beyond rhinosinusitis. Preoperative high-resolution computed tomography scan is essential in providing surgical map for surgeons. In addition, it gives valuable information about origin, nature and extension of the pathology to adjacent structures. Therefore, CT scan is crucial in order to perform successful and complete surgery with avoidance of complications. The main objective of this research is to propose a new comprehensive, simplified, practical, and applicable pre-endoscopic sinus surgery CT scan checklist. Methods & Results: Extensive literature review in database engines was conducted. 4 Published checklists were identified and reviewed carefully. The strength as well as the deficiencies in the previous lists were identified. Accordingly, a new checklist was constructed. It incorporates significant pathological data in addition to the previously included items. It also considered surgeon's most common pattern in looking and analyzing the CT scans. The new checklist was validated. Conclusion: Preoperative CT checklist for endoscopic sinus surgery improves surgeon understanding of the anatomy, nature of the disease and helps planning the surgery. Utilizing the checklist aid to organize the process of interpretation the CT scans and avoids missing significant findings. Careful reviewing of preoperative images with radiologist can help to address critical anatomical areas and to avoid complications.



1422

Ultra-low-dose CBCT: new cornerstone of paranasal sinus imaging

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We present two studies of clinical image quality (IQ) and usability of a sinonasal ultra-low-dose (ULD) cone-beam computed tomography (CBCT) scan. The results are compared to those of a high resolution (HR) CBCT scan to identify strengths and weaknesses of a ULD CBCT protocol. Sixty-six anatomical sites in 33 subjects were imaged twice using two imaging modalities: HR CBCT (Scanora 3Dx scanner; Soredex, Tuusula, Finland) and ULD CBCT (Promax 3D Mid scanner; Plandent, Helsinki, Finland). The IQ of paranasal sinuses (in-focus) and ear (off-focus) were evaluated. IQ of paranasal ULD CBCT is sufficient for clinical diagnostics, and may be considered for surgical planning. We recommend it as the primary imaging protocol for all patients meeting imaging criteria due to recurrent or chronic nasal symptoms. Additional or conventional imaging might be needed for patients with extensive chronic rhinosinusitis and/or indications of frontal sinus involvement. Information at image margins are underutilized. HR CBCT can produce excellent structural resolution with conventional imaging parameters, even with off-focus images, while ULD CBCT provides good comprehension of significant structures regarding ear surgery. It is mandatory to develop imaging protocols towards lesser radiation exposure as well as to prove that new methods are clinically valid and applicable.

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Analysing the feasibility of an automated AI-based classifier for detecting paranasal anomalies in the maxillary sinus

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Introduction: Large scale population studies have been performed to analyse the rate of finding sinus opacities in cranial MRIs. It is of interest whether there are findings requiring clarification. Using AI-based methods can automate the detection of the sinus opacities and reduce the workload of clinicians. In this work, a method for AI-based classification was developed in order to automatically recognise paranasal sinus opacities. **Methods:** As part of the Hamburg City Health Study (HCHS), cMRIs of participants (45-74 years) were recorded for neuroradiological assessment. The following questions were addressed: 1. Is there an opacity of the maxillary sinus: yes/no? 2. Differentiation of opacity: mucosal thickening, polyp(s) or cyst(s). All MRIs (199) were annotated by specialists and the results of the AI were compared with this as a "gold standard". 106 participants showed inconspicuous and 93 participants maxillary sinuses with opacities. The AI-based classification system was carried out by a neural network (3D ResNet18), the data analysis was performed using a 5-fold cross-validation. **Results:** Considering "opacity" as the positive class, our AI classification system showed high classification accuracy (F1 score of 0.70 ± 0.06 and an Area under Receiver Operating Characteristic (AuROC) of 0.85 ± 0.03). In the further classification of opacities, our AI-based method achieved an accuracy of 100% for polyps, 60% for cysts and 45% for mucosal thickening. **Conclusions:** Our feasibility analysis shows a useful application for AI-based classification of the maxillary sinuses



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High resolution ultrasonography in nasal trauma at the emergency settings, is it the new gold standard?

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Background: Although nasal bone fractures are the most frequent in maxillofacial trauma, clinical diagnosis is still the common practice. Objective: The Aim of this study is to compare the common practice in nasal trauma evaluation by clinical examination alone to HRUS. Patients and methods: A retrospective study included all patients older than 4 years who were examined in our ENT emergency room in 2019 for recent nasal trauma. Each patient was diagnosed for nasal fracture based on clinical examination. Within 7-10 days, all the patients underwent a further high-resolution ultrasonography of the nasal bone by an experienced radiologist, who was blinded to the clinical diagnosis, for establishing a sonographic diagnosis. The sensitivity, specificity, positive predictive value, and negative predictive value of the clinical diagnosis were calculated. Results: 104 patients finished the clinical and sonographic evaluation. The sensitivity, specificity, positive predictive value, and negative predictive value of the clinical diagnosis were: 74.4%, 86.6%, 92.7% and 37.1% respectively. Conclusions: The low sensitivity and negative predictive value indicate that nasal bone trauma investigation in the emergency setting should not rely only on clinical examination. High resolution ultrasonography should be considered as a routine tool in these cases.



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Radio-anatomic evaluation of the sphenoid sinus variations in a Colombian population

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Background: The surgical approach to the sphenoid sinus is a complex procedure due to its location and proximity to important neurovascular structures. Comprehensive knowledge of the radiological anatomy of this region is crucial to select the best surgical approach and avoid complications. Few studies assess the anatomic variations of these structures in ethnic and Latin American populations. This study aimed to assess the frequency of the anatomical variants of the sphenoid sinus in a Colombian population. **Methods:** Observational, descriptive, cross-sectional study. A randomized sample of 406 axial computed tomography (CT) of the paranasal sinuses that included 812 sphenoid sinuses were collected during 2019 at the Fundación Santa Fe de Bogotá, Colombia. **Results:** The most frequent pneumatization was sellar pneumatization with a frequency of 89.9%. The lateral pneumatization of the sphenoid was found in 346 (42,6%) of the 812 paranasal sinuses; 33% contained Onodi cells, and 40.81% contained a protruding vidian nerve into the sinus. Dehiscence of the optic nerve and the internal carotid artery was found in less than 10% of the total CTs. Sphenoid sinus hyperostosis was found in less than 3% of the cases. **Conclusions:** To carry out an adequate approach to the sphenoid sinus, the surgeon should know the individual's anatomical configuration of the sinus and the variability that could lead to potential complications. This study provides a better anatomic understanding in Colombian populations. However, further studies in ethnic populations are needed.



1711

Frontal Recess Anatomy in a Southern European Country Population: a Radiological Study

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Introduction Frontal recess anatomy is highly variable. International Frontal Sinus Anatomy Classification (IFAC) published in 2016 tried to establish a comprehensive and universal assessment of facial recess cells. **Objective** To characterize the anatomy of the frontal recess in the Portuguese population. **Methods** Evaluation of frontal recess cells and frontal recess measures of a sample of patients that attended our outpatient ENT clinic in the last 5 years and underwent a CT scan. **Results** 71 patients were included, which corresponded to 142 nasal cavities: 60 without frontal disease and 82 with chronic rhinosinusitis with different grades of frontal sinus opacification. 50.7% were female. Mean age was 48.7 years old (18-89). The most frequent cell was agger nasi cell (97.2%) and the least frequent was supraorbital ethmoidal cell (4.9%). There was no statistical difference between genders for the incidence of the different cells. Anteroposterior frontal recess width was 9.97 ± 2.29 mm for female and 10.55 ± 2.87 mm for male ($p > 0.05$). Nasofrontal beak thickness was also higher in male population (7.80 ± 1.93 mm) than in female (7.25 ± 2.0 mm) ($p > 0.05$). **Conclusions** Prevalence of frontal recess cells in our population was similar to other studies with Caucasian and Asian population. The thickness of the nasofrontal beak and anteroposterior width of frontal recess seem to be higher in male population, which can affect our approach to the frontal sinus. ENT surgeons should have a high level of knowledge of frontal recess anatomy to perform safe and effective frontal sinus surgeries.



Late breaking Abstracts 2

1791

RE-DESIGNING THE SALINE RINSE SQUEEZE BOTTLE AND TECHNIQUE TO OPTIMISE SINUS LAVAGE AND TOPICAL MEDICATION DISTRIBUTION

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Late breaking Abstracts 2 | Room 10 Peroto - Level 0 | Wednesday 21/06/2023/

Aim: Saline squeeze bottles use 200-240mL, with a 5mm nozzle, aimed vertically with a 45 degree head angle. Evidence for these variables remains limited due to inadequate experimental models (cadaveric, 3D printed, imaging of labelled dyes). We aimed to optimise the design of squeeze bottles, in terms of volume, squeeze force and head angle, using computational fluid dynamics (CFD). **Methods:** A sinonasal cavity computational model was reconstructed from CT scans of a healthy 25-yo female. In a series of experiments: 1) A novel CFD technique using the Eulerian Volume of Fluid method was developed. 2) Typical squeeze forces and volumes were determined from electromechanical experiments. 3) Parametric CFD experiments using a variety of a) irrigation volumes (70, 150, 200, and 400 mL) b) squeeze forces (ramp time 0.1, 0.5, and 1.0 s) and c) head tilt angles (0° Straight, 45° Forward, 45° Left, 45° Right and 45° Backward) were performed. Velocity, pressure, and wall shear stress, together with mapping of surface coverage and residual volumes were determined. **Results:** Compared with standard squeeze bottles, higher volume irrigation (400 mL) and greater squeeze force (ramp time 0.1 s), along with backward head tilt optimised irrigation coverage and shear force on sinonasal mucosal surfaces. 400mL prototype squeeze bottles were designed, prototyped and manufactured and are currently undergoing clinical testing. **Conclusion:** Using multiple parametric CFD experiments our saline rinse squeeze bottle design and technique improved sinonasal mucosal coverage (> 3X) and shear force.



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AN ARTIFICIAL INTELLIGENCE ALGORITHM TO AUTOMATE PRE-OP SAFETY CHECKLIST REPORTS ON SINUS CT SCANS

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Late breaking Abstracts 2 | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Introduction: Pre-operative checklist assessment of paranasal sinus CT scans is critical for safe sinonasal surgery. Radiologist reporting of sinus CT scans often does not meet the requirements of rhinologists. We aimed to create a comprehensive package of Convolutional neural network (CNN)-based Artificial intelligence (AI) algorithms that are able to automatically produce consistent, detailed, pre-operative checklist reports from sinus CT scans. **Method:** Consecutive sinus CT scans were retrospectively collected between January 2016 and December 2018 at a tertiary hospital. Key features (anterior ethmoid artery (AEA), Keros classification, concha bullosa, sphenoid pneumatization) were identified by two blinded otolaryngology trainees and used as ground truth data. The classification layer of the Google Inception-V3 CNN was retrained in Python using a transfer learning method. Segmentation analysis was also performed to increase diagnostic accuracy. **Discussion:** 675 training images and 197 test images were used. The algorithm was able to distinguish between an AEA in a mesentery vs within the skull base with an accuracy of 82.7% (95 % CI: 77.7–87.8), kappa statistic of 0.62 and AUC of 0.86. Concha bullosa was identified with an accuracy of 81% (95% CI: 73.0–89.0), AUC 0.93. Keros classification achieved an accuracy of 73.6%, AUC 0.79. Sphenoid classification achieved an accuracy of 85.9%, AUC 0.86. **Conclusion:** Our CNN based algorithms demonstrate significant promise in identifying clinically important radiological features on pre-operative sinus CT scans.



1793

A NOVEL SPRAY NOZZLE TO PRECISELY DELIVER TOPICAL MEDICATION TO THE POST-FESS MAXILLARY SINUS

Narinder Singh

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Late breaking Abstracts 2 | Room 10 Peroto - Level 0 | Wednesday 21/06/2023

Aim: Standard spray nozzles typically only achieve around 3% deposition in the post-FESS sinuses for particles in the 4-20 μm range, with most particles deposited anteriorly within the nasal cavity or passing through to the nasopharynx. Traditional methods of determining deposition using cadaver or 3D printed models are inaccurate. We aimed to design a novel spray nozzle to optimize topical medication distribution within the post-FESS maxillary sinus using computational fluid dynamics (CFD). **Methodology:** A CT of a CRS patient was used to create a virtual post-operative computer model. Particles of diameter 2 to 30 μm were tracked through the sinonasal cavity at 5, 10 and 15 L /min flow rates using CFD. Reverse particle simulations were performed and the optimal injection point identified. An optimised nozzle position and shape was placed virtually and multiple parametric CFD experiments performed to identify the ideal combination of particle size, injection velocity and inhalation velocity. **Results:** CFD simulations demonstrated that the optimised combination of parameters were 20 μm particles, delivered at 5 m/s (or 14 μm , delivered at 15 m/s) at an inhalation rate of 5 L/min, released from a nozzle in an elliptical oblique-superior direction into the superior half of the nasal valve. This significantly improved the maximum deposition efficiency (from 3% up to 55%) in the post-operative maxillary sinus. **Conclusion:** Our novel spray nozzle design improved topical medication distribution 18-fold.



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Modelling the effects of post-FESS middle turbinate synechiae on sinonasal physiology: A computational fluid dynamics study

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Introduction: Middle turbinate (MT) lateralisation and synechiae formation is a common cause of failed FESS. We aimed to use computational fluid dynamics (CFD) to analyse the physiological effects of post-FESS MT synechiae. **Methods:** A 3D computational model was created from CT-sinus DICOM data of a healthy 25-yo female. Virtual full-house FESS was performed. Multiple synechiae models were virtually created in locations reflecting those commonly seen in clinical practice. CFD analysis was performed and compared with a control without synechiae. Mass-weighted averages for airflow velocity, humidity and mucosal/ air temperature were calculated to assess changes in the presence of synechiae. **Results:** All synechiae models demonstrated aberrant downstream sinonasal airflow. There was reduced airflow and increased air temperature and humidity in the ipsilateral frontal, ethmoid and sphenoid sinuses with increased airflow velocity and reduced air and mucosal surface temperature in a concentrated central "jet" in the middle meatal region. The effects were more significant with larger synechia. Despite the magnitude of these local effects, the effect on bulk inspired airflow at the nasopharynx was almost negligible. **Conclusion:** Post-FESS synechiae between the MT and lateral nasal wall significantly disrupt local downstream sinus ventilation and nasal airflow. These findings may explain the significant persistent symptoms seen in post-FESS patients with MT synechiae and reinforce the importance of prevention and adhesiolysis.



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Correlation of Nasal Mucosal Temperature and Nasal Patency—A Computational Fluid Dynamics Study

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Aims: Recent evidence suggests that detection of nasal mucosal temperature (NMT), rather than direct airflow detection, is the primary determinant of subjective nasal patency. We examine the role of NMT in the perception of nasal patency using in vivo and computational fluid dynamics (CFD) measurements. **Methods:** Healthy adult participants completed Nasal Obstruction Symptom Evaluation (NOSE) and Visual Analogue Scale (VAS) questionnaires. A probe measured NMT at the vestibule, inferior turbinate, middle turbinate, and nasopharynx bilaterally. A CT scan was used to create a 3D nasal anatomy model to perform CFD analysis of nasal mucosal and inspired air temperature and heat flux along with mucosal surface area where heat flux > W/m² (SAHF50). **Results:** Eleven participants with a median age of 27 (IQR 24; 48) were recruited. Probe-measured temperature values correlated strongly with CFD-derived values ($r = 0.87$, $p < 0.05$). Correlations were seen anteriorly in the vestibule and inferior turbinate regions between NMT and unilateral VAS ($r = 0.42$ to 0.46 ; $p < 0.05$), between SAHF50 and unilateral VAS ($r = -0.31$ to -0.36 ; $p < 0.05$) and between NMT and SAHF50 ($r = -0.37$ to -0.41 ; $p < 0.05$). Subjects with high patency (VAS

1798

Endotyping rhinosinusitis via nasal secretions: a pilot study

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Introduction. The finding of eosinophil aggregates on histopathology indicates a T2 endotype.. The use of nasal secretions might be an underestimated and yet valid instrument to characterise rhinosinusitis. patients at consultation. **Methods.** Twenty two patients with acute rhinitis , 10 allrgic patienets and 9 difficult to treat allergic patients under desensibilisation therapy at least for 1 year were sampled for analysis of cellulkar content.compared to 10 controls.**Results.** In the rhinitis group 2 patients showed eosinophilic aggregates, Two had poor cellular content and 16 showed a dominant neutrophil content. The allergic group showed 2 neutral findings with epithelial shedding,, 4 had a main neutrophil content and 3 patients showed eosinophilic aggregates. In the immunisation group 6 out of 9 patients showed eosinophilic aggregates.**Discussion**The early detection of eosinophilic aggregates in the immusnisation group may confront us with a parallel a more agresive inflammation patterns . The finding in allergy and rhinitis patients suggests this entity might be more frequently present in a younger population. **Conclusion.** The finding of eosinophil aggregates suggests a T2 inflammation pattern. Hence the finding opens new questions on adequate treatment modalities if current treatment fails to control the inflammatory burden. In the era of the epithelial barrier hypothesis growing concern needs close observation criteria.



1802

Management of Anterior Skull Base Cerebrospinal Fluid Leak: A Ten-Year Tertiary Referral Center Analysis

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Objectives: Anterior cerebrospinal fluid (CSF) leak can occur as a result of different etiologies such as head trauma, skull base surgery, inflammatory diseases or spontaneously. Rapid identification and treatment are essential to prevent complications and achieve successful surgical repair. This study aims to outline the clinical characteristics of patients with anterior CSF leak and the outcomes surgical treatment. **Method:** This is a retrospective analysis of 76 patients who presented with an anterior skull base CSF leak to our center and underwent transnasal endoscopic repair by three different otolaryngologists surgeons between 2012 and 2022. Their medical notes were reviewed for demographic, clinical data including diagnostic, surgical techniques and material used in the surgery. **Results:** Seventy patients underwent endoscopic repair CSF leak, of which 45 (59%) were women and the average age was 46 years old. The most common etiology was iatrogenic post skull base surgery followed by spontaneous etiology. the most common CSF leak site was 20 followed by 18. Nasoseptal flap was used in 45 patients, middle turbinates flap was used in 3 patients, whearse synthetic materials were used in 64 patients. In 60% of the patients the first symptom was a runny nose. Overall, the success rate was 92 percent on the first attempt and 98% on the second attempt. **Conclusions:** Endoscopic transnasal approach seems to be effective and safe with a high success rate. Moreover, the Hadad flap was used in most cases and found to be suitable for most CSF leaks.

1804

Impact of biologics on revision FESS numbers in CRSwNP patients

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Background: Since 2022, two biologics are reimbursed for uncontrolled severe CRSwNP by the Belgian medical health insurance. Biologics are often indicated in patients having recurrent or persistent CRSwNP despite sinus surgery and medical standard-of-care treatment. There are no data on the impact of the prescription of biologics on the number of revision FESS procedures being performed in tertiary care centers. **Aims:** To evaluate the impact of the prescription of biologics on the number of revision FESS procedures being performed in a tertiary care center in a well-defined period of time after reimbursement of biologics by health insurance. **Method:** Analysis of the number of patients undergoing revision FESS for CRSwNP, and number of patients on prescription for biologics for CRSwNP at the University Hospitals in Leuven in between September till December in the year 2020, 2021 and 2022. **Results:** A total of 61 revision FESS surgeries were performed the defined periods in 2020, 2021 and 2022. With 34, 13 and 14 Revision FESS operations in 2020, 2021 and 2022 respectively. The percentage of revision surgeries compared to primary FESS dropped from 68% and 46% in 2020 and 2021 respectively, to 42% in 2022. The number of patients started on a biologic in the same defined period in 2022 was 22. **Conclusion:** The reimbursement of biologics in Belgium reduced the number of revision FESS compared to primary FESS surgeries in patients with CRSwNP.



1805

Prevalence and impact of Chronic Rhinosinusitis in patients with severe asthma at a national referral hospital in Chile

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Chronic rhinosinusitis (CRS) is a common comorbidity in patients with asthma. However, the prevalence and impact of CRS in severe asthmatic in Chile are poorly understood. The aim was to determine the prevalence of CRS in severe asthmatic at the Instituto Nacional del Tórax in Chile and to evaluate the impact of CRS on asthma control, quality of life and lung function. This cross-sectional study enrolled 58 patients with severe asthma. CRS was diagnosed based on the EPOS 2020 guideline. All patients underwent a comprehensive evaluation including nasal endoscopy, computed tomography, spirometry and assessment of nasal symptoms, quality of life using SNOT-22, and asthma control. The prevalence of CRS in patients with severe asthma was 62%, and only half had a previous diagnosis of CRS. Among patients with CRS, 56% had nasal polyps and 25% had aspirin-exacerbated respiratory disease. There were no significant differences in the severity of nasal symptoms between patients with and without CRS. However, patients with CRS had significantly worse quality of life, asthma control, and lung function. Our study found a higher prevalence of CRS in severe asthmatic patients than reported in the literature, likely due to the severity of asthma. Even though we did not find differences in the severity of nasal symptoms, CRS is a significant comorbidity in these patients and negatively impacts quality of life, asthma control, and lung function. Therefore, we recommend that all patients with asthma, especially severe asthma, undergo a thorough rhinology assessment to detect and manage CRS.

1807

Hyaluronan and its association with the lymphatics may drive pathogenesis of chronic rhinosinusitis

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AbstractBackground: Pathomechanisms of chronic rhinosinusitis (CRS) with (CRSwNP) and without nasal polyps (CRSsNP) are not yet fully elucidated.Objective: To uncover possible novel factors of CRS pathogenesis.Methods: In sections of different anatomical regions of CRSwNP, CRSsNP and control patientsHyaluronan (HA) was localized (n=6 per group) and lymphatic vessels (LVs) and selected immunecells were localized and counted (n≥6 per group). HA and lymphatic vessel endothelial receptor 1(LYVE-1) were analyzed in lysates of the same tissues (n=7 per group) and the secretions ofCRSwNP, CRSsNP, and control patients (n=30 per group) using ELISA. Tissue HA levels were correlated to the numbers of immune cells and LVs.Results: HA and immune cells were accumulated below the NP epithelium. There were no significant differences in tissue HA expression while LYVE-1 was overexpressed in NP. The mucusrevealed a significant underexpression of HA in both CRS groups and of LYVE-1 in CRSsNP.There were less LVs in both CRS groups compared to the control. Tissue HA levels revealedsignificant positive correlations with the numbers of macrophages and transporting LVs, but notwith absorbing LVs.Conclusion: The mucosal accumulation of HA due to altered synthesis, metabolism andinsufficient lymphatic evacuation might promote inflammation, fluid retention, and thus polypformation.Key words: chronic rhinosinusitis, chronic rhinosinusitis with nasal polyps, sinusitis, mucus,inflammation, hyaluronic acid, endothelial cells, eosinophil, immunity, lymphangiogenesis



Poster Abstracts

Acute Rhinosinusitis

1690

Application of acoustic rhinometry to evaluate infectious inflammatory conditions of the upper respiratory tract

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Poster Session | Acute Rhinosinusitis | 18 June – 22 June, 2023, All day

The aim of the study was to demonstrate the correlation between the results of acoustic rhinometry and symptomatology of acute inflammations of the upper respiratory tract. The study group consisted of 37 people with the signs of infection of the upper respiratory tract of viral or bacterial etiology. The method that was used in the study was an acoustic rhinometry (Rhinoklack RK 1000, Stimotron, Germany) and a clinical assessment of subjective nasal complaints. Results. Among the analysed nasal complaints including sneezing, free discharge of watery mucus and nasal congestion, the last one demonstrated the strongest correlation of concordance with the assessment of the intranasal spaces assessed with acoustic rhinometry ($r=-0.369$, $p=0.025$). Conclusions. It has been observed there is a high concordance between the symptomatology of the inflammation of the nasal mucous membrane and the dynamics of changes measured with acoustic rhinometry.



1546

Acute Rhinosinusitis Complicated with an Epidural Haematoma - A Case-Report

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Poster Session | Acute Rhinosinusitis | 18 June – 22 June, 2023, All day

Intracranial complications of acute rhinosinusitis (ARS) carry a substantial risk of morbidity and mortality. Epidural haematomas arising into the potential space between the cranial bones and the dura mater, have been scantily reported in the literature, as sequelae of sinusitis. We present a rare case of pansinusitis, complicated with an epidural haematoma in the right frontal area. A previously healthy 16-year-old boy was brought to the Emergency Department with a 3-day history of fever, headache, nasal obstruction and purulent discharge. Within the last 12 hours he had developed a mild right eyelid oedema with frontal bossing. Nasendoscopy revealed purulent secretions in both nasal cavities and neurological examination was unremarkable. A contrast-enhanced CT scan showed a 2cm hypodense collection with rim enhancement in the right frontal epidural space and opacification of the paranasal sinuses. The patient underwent urgent full endoscopic sinus surgery combined with right frontal trephination. On the third postoperative day he developed somnolence and an urgent MRI demonstrated a 6cm biconvex, heterogenous mass in the right frontal area. An urgent frontal craniotomy was performed by the neurosurgical team and an epidural haematoma was discovered and evacuated. The posterior wall of the right frontal sinus was found intact. The patient had an uncomplicated recovery and completed a 4-week course of intravenous antibiotics. Complicated ARS warrants close monitoring for any signs of deterioration with proactive investigation and multidisciplinary management approach.



1645

ePROs (electronic patient reported outcomes) as primary outcome of pivotal registration studies in rhinosinusitis and allergic rhinitis

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Poster Session | Acute Rhinosinusitis | 18 June – 22 June, 2023, All day

Acute rhinosinusitis is a self-limiting disease, characterized by numerous subjectively perceived symptoms. The severity of the disease is therefore usually assessed using standardized, validated symptom scales. These can be elegantly depicted in the form of a smartphone application. The concept of "bring your own device" offers the advantage that reminder functions and time windows can be seamlessly integrated into the patient's daily routine. This makes it possible to increase the reliability of the recording to 90% or more of the required data points. We report here on a study (Rhinnovate HA, EudraCT- 2022-002499-35) with innovative nasal sprays in which a data quality of up to 94% was reached in a population of more than 500 patients in different EU countries (Bulgaria, Germany, Croatia and Poland). Such a high rate can only be achieved through close (daily) remote monitoring of the devices. Only with this innovative technology, ePROs (electronic patient reported outcomes) add the value to the primary outcome of pivotal registration studies in rhinosinusitis.



1646

A randomized double-blind placebo-controlled phase III clinical trial of xylometazoline plus hyaluronic acid in acute rhinosinusitis

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Poster Session | Acute Rhinosinusitis | 18 June – 22 June, 2023, All day

Rhinosinusitis is a common condition in most of the world, leading to a significant burden on society in terms of healthcare consumption and productivity loss. Acute rhinosinusitis (ARS) has a one-year incidence of 6 – 15% and is usually the consequence of a viral common cold. Xylometazoline primarily relieves nasal congestion and has well-established use in acute rhinosinusitis. The combination therapy of xylometazoline with hyaluronic acid (HA) would be useful due to the contribution of HA to symptomatic relief in terms of nasal epithelial dysfunction and protection of nasal mucosa. HA stimulates mucociliary clearance and thus accelerates the removal of noxious agents (pathogens, allergens) from the nasal cavity. It also accelerates recovery by restoring the integrity of epithelial barrier and relieves irritation by hydrating nasal mucosa. All of these factors contribute to overall symptom control and provide a basis for demonstrating superiority in efficacy of the combined treatment compared to xylometazoline mono-treatment. We report on a randomized double-blind placebo controlled phase III clinical trial with more than 500 patients comparing the combination product with both mono-substances and placebo. Efficacy was assessed using the total nasal symptom score, peak nasal flow, nasal endoscopy, odor and saccharine tests.



Allergic Rhinitis

1658

Preliminary investigation of COVID-19 infection rate and symptoms in patients with allergic rhinitis

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Poster Session | Allergic Rhinitis | 18 June – 22 June, 2023, All day

Objective To explore the COVID-19 infection rate and symptoms in patients with allergic rhinitis. **Methods** The survey included the ENT out-patients from the Hangzhou First People's Hospital as the subjects. The infection rate and symptoms of COVID-19 in patients with allergic rhinitis were investigated and analyzed by sending online questionnaires. **Result** A total of 383 patients completed the questionnaire. AR patients or other Patients with a history of respiratory allergic symptoms accounted for 39.95% of the patients, and COVID-19-positive patients accounted for 93.22%. We found the most common symptoms in adults were fever, cough, and nasal congestion by summarizing and analyzing the symptoms of COVID-19-positive patients. The symptom scores of AR patients and other Patients with a history of Respiratory allergic symptoms were compared with those of the control group and there was no significant difference ($P > 0.05$). However, only the purulent mucus symptom of allergic rhinitis patients had a slightly lower score than the control group, which was statistical significance ($P < 0.05$). **Conclusion** The symptoms of patients with allergic rhinitis or other patients with a history of respiratory allergic symptoms were not significantly milder than other patients.



1288

The influence of the social determinants of health (SDH) on the increase of specific IgE in the Japanese patients

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Poster Session | Allergic Rhinitis | 18 June – 22 June, 2023, All day

Introduction: WHO describes "The social determinants of health (SDH) are the non-medical factors that influence health outcomes." Various factors are reported to affect allergy as SDH out of Japan. We have studied the relation between the poverty and various diseases as a Japan's first Health Promoting Hospital certified by WHO. The number of patients with allergy has increased in the world. In this study, we evaluated the effect of poverty on the serum level of specific IgE. This study was approved by the ethnic committee of our hospital. **Materials and Methods:** The 426 subjects were recruited and the serum level of specific IgE were tested against 16 kinds of allergens including pollen, house dust mite, fungus and insects by ImmunoCap assay. An economic status was separated to two groups, poverty or non-poverty, by the kind of insurance. **Results:** The rates of sensitization were significantly lower in the poverty group than that in the non-poverty group about Japanese cedar pollen, cypress pollen and house dust mite. It was significantly higher in the poverty group than in the non-poverty group about the cockroach. **Discussion:** These results suggest that the poverty may also affect the production of specific IgE in Japan.



1311

The dietary n-6 and n-3 fatty acids ratio may affect the sensitization to Japanese cedar pollen.

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Poster Session | Allergic Rhinitis | 18 June – 22 June, 2023, All day

Introduction: About 40% of Japanese suffer from Japanese cedar polinosis. Recent literature suggests that the increased intake of n-3 (also called omega-3) fatty acids may reduce the risk of allergic diseases. In the present study, we investigated whether the dietary n-6/n-3 fatty acids ratio affects the sensitization to Japanese cedar pollen (JCP). **Subjects and methods:** The study comprised 1109 residents who had participated in the health checkup called 'the Iwaki Health Promotion Project' in Aomori Prefecture Japan in 2016. Blood samples were analyzed for levels of allergen specific IgE against JCP. If the specific IgE score was above 0.35 kU/L, we defined that they were sensitized to the JCP. The participants wrote BDHQ (Brief-type self-administered diet history questionnaire), and we calculated the n-6/n-3 fatty acids ratio. Sensitization rates to JCP were compared between those with high and low n-6/n-3 fatty acid ratios. **Results:** In participants above 50 years, the JCP sensitization rate in the high n-6/n-3 fatty acids ratio group was significantly higher than in the low ratio group.

1424

A hypertonic seawater-based nasal spray relieves seasonal allergic rhinitis symptoms in adults

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Poster Session | Allergic Rhinitis | 18 June – 22 June, 2023, All day

Seasonal allergic rhinitis (AR) causes inflammation-related nasal and ocular symptoms, reducing patients' quality of life. This study aimed to investigate the safety and performance of a hypertonic seawater-based nasal spray enriched with calcium and manganese to relieve AR symptoms in adults. We conducted a prospective, single-cell, product-blinded clinical trial with 59 adults (31.1 y; 27 M, 32 F) with ongoing symptomatic AR confirmed with a positive skin prick test. Subjects applied 2 sprays in each nostril for 1 to 6 times daily for 14 days. During the study, the nasal spray significantly reduced from the 7-day run-in period the daily morning and evening severity scores of nasal congestion and itching, sneezing, runny nose, and eye itching, watering, puffiness, and dryness ($P < 0.05$). Daily sleep difficulty scores significantly decreased from the 7-day run-in period ($P < 0.001$). At 1- and 10-minutes post-nasal spray application on Day 0, severity scores of nasal congestion and itching, sneezing, and eye itching, watering, and puffiness significantly decreased from pre-application ($P < 0.05$). The daily intervals between the first and second nasal spray applications were longer than 4 hours ($P < 0.05$). There were no product-related adverse events. In conclusion, the nasal spray effectively relieved AR-related nasal and ocular symptoms and improved sleep difficulty.

**1444****The effect of Immunotherapy on the voice quality of Allergic Rhinitis patients****Panayiota Mouteveli**, GEORGIA Katsouli, Georgios Mireas¹UNIVERSITY OF PELOPONNESUS

Poster Session | Allergic Rhinitis | 18 June – 22 June, 2023, All day

Allergic Rhinitis (AR) is an inflammatory condition of non-infectious etiology, that affects the voice quality. Subcutaneous and Sublingual Immunotherapy (SSI) is a major therapeutic intervention to reduce the disease and treat allergic symptoms. We aim to investigate the efficacy of SSI on voice quality in patients with (AR), using the Voice Handicap Index (VHI) and the Voice Analysis software, Praat. We compared the phonetic parameters of 27 patients aged 18-58 years with (AR) before the beginning of SSI (group 1) and after the completion of 3 years (group 2). From the objective acoustic analysis of the voice through Praat, we studied the fundamental frequency (F0), the amplitude variability (shimmer%) and the variability of the fundamental frequency (jitter%), as well as the ratio of noise to the harmonic waves (NHR) of the sound signal produced. The questionnaire (VHI) was used as a subjective indicator of self-assessment of the voice of patients with allergic rhinitis pre- and post-Immunotherapy. Results: The comparison of the variables of two groups showed that all objective phonetic parameters improved upon completion of 3-year Immunotherapy, with a statistically significant difference observed in all, except (F0), where improvement was not significant ($p > 0.05$). Also, the score in VHI improved after 3-year therapy, with a statistically significant difference ($p < 0.05$). Conclusion: The AR patients who have achieved symptomatic depletion and reduction of inflammatory disease after 3 year Immunotherapy, had a significant improvement of their voice analysis.



1593

Effect of gut microbial composition and diversity on major inhaled allergen sensitization and onset of allergic rhinitis

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Poster Session | Allergic Rhinitis | 18 June – 22 June, 2023, All day

Background: Decreased gut microbiota diversity is associated with gut dysbiosis and causes various diseases, including allergic diseases. We investigated the effect of gut microbial composition and diversity on major inhaled allergen sensitization and onset of allergic rhinitis. **Methods:** This study included 1092 local residents who had participated in the Iwaki Health Promotion Project in 2016. Blood samples were analyzed to ascertain specific IgE levels against major inhaled allergens (JCP, HD1, Grass-mix, Weed-mix). Fecal samples were analyzed for bacterial 16S rRNA using next generation sequencing. The diversity index (α -diversity, β -diversity) and the composition of gut microbes in phylum/order levels were compared between patients sensitized or unsensitized to allergen, and symptomatic and asymptomatic groups.

Results: Some α -diversity metrics were significantly decreased in patients who were sensitized to allergens. β -diversity differed significantly between those unsensitized and sensitized to allergens. The relative abundance of Bacteroidales was significantly lower in the unsensitized group. The composition and diversity of gut microbiota were similar between the symptomatic and asymptomatic groups. **Conclusions:** Our results suggest that lack of diversity in gut microbiota has an effect on sensitization to allergens. However, the onset of allergy symptoms was not significantly associated with bacterial composition and diversity.



1624

Allergic Rhinitis – Representation of symptoms and allergens

Mirjana Stracenski- Perge

Poster Session | Allergic Rhinitis | 18 June – 22 June, 2023, All day

ALLERGIC RHINITIS – REPRESENTATION OF SYMPTOMS AND ALLERGENS

Introduction Allergic Rhinitis is characterised by symptoms which arises as reaction of immune system on presens of the specific allergen. The aim- Presentation of the frequency of symptoms and confirmed allergens in patients with Allergic Rhinitis. **Material-** Set of standardised inhaled allergens for Prick test. **Method-**Retrospective study. Data were obtained from Allergological protocol in ENT ambulance in period from 3.10.2019- 1.11.2021. **Result-** 116 patients participated in research, 66 male and 50 women. The average age was 20.30 for male and 30.38 for women. All of them had positive result of Prick test. Symptoms in the form of secretion, nasal obstruction, coughing, sneezing and headache were presented in varying degrees. **Discussion-** It was found that 48 patients had one symptom where nasal obstruction dominates, while other patients had associated symptoms. In relation to age more frequent occurrence of certain symptoms wasn't found. From the whole number of patients, 55.17% had one allergen positive result of the Prick test, 33.62% had positive Prick test on two allergens and 11.21% on three or more allergens. **Conclusion-** No higher frequency of individual symptoms and allergens has been demonstrated. Symptoms and allergens were equally represented.



1732

Endoscopic Dacryocistorhinostomy

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Poster Session | Allergic Rhinitis | 18 June – 22 June, 2023, All day

Methodology: To analyse advantages, complications and recidivations of the Endoscopic Dacryocistorhinostomy. To compare surgical results of the endoscopic dacryocistorhinostomy with the classic surgical method which has been used until now in our country and also to review the literature of the endoscopic dacryocistorhinostomy. To show the results of recurring external DCR and reoperation of these cases with endoscopic DCR. We have used χ^2 test to compare the percentage of categorical variables. For p value of $p \leq 0.05$. **Results and Discussion :** This study is done at Albanian Eye Clinic during the period from February 2016- February 2022. There has been involved 174 (16 - 82 years) with nasolacrimal duct obstruction. The success rate of the patients treated with endoscopic DCR was 92.5% according to Umer et al at values 75-95 %.The success rate in the control group with the external Dacryocystorhinostomy was 89.2% according to the authors Jack.J.Kanski 87.5% and Andre Aroni 98%. **Conclusion:** Endoscopic DCRS is a valuable method with a high success rate for the treatment of nasolacrimal duct obstruction. Endoscopic DCR is less invasive preserves the anatomic structures, shortens the operation time and also a rapid rehabilitation of the patient. The results of the operated patients with this method at our clinic have a comparable result to the contemporary literature. Recurring (unsuccessful cases) are mainly as a result of granulation tissue.



1761

Allergic Fungal Rhinosinusitis complicated with sudden onset Diplopia

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Poster Session | Allergic Rhinitis | 18 June – 22 June, 2023, All day

Allergic Fungal Rhinosinusitis is an IgE mediated reaction to fungi in the paranasal sinuses. It can be either acute usually in immunocompromised patients or chronic usually in immunocompetent patients. The infection can progress as a result of inflammatory invasion from the paranasal sinuses to adjacent structures like the orbits or intracranial dissemination. The disease usually has a chronic course but can be complicated from infiltration of the surrounding structures resulting in proptosis, diplopia, visual impairment, cranial nerve deficits. We present a 30 year old Caucasian female that was referred to the Emergency department for sudden onset diplopia, nasal congestion and persistent headache. Clinical examination revealed thick mucus plugs and nasal polyposis mainly in the right nasal cavity. Moreover, the right orbit was deviated medially and superiorly. Imaging showed right sphenoid sinus mucocoele extending to the pterygoid process of the sphenoid bone and posterior ethmoid cells. After 24 hours conservative therapy without resolution, surgical intervention with FESS followed. Upon recovery all symptoms had subsided. The pathology report showed Aspergilloma. The patient was discharged after two days of hospital stay with medication and a planned follow up. Early diagnosis and prompt treatment is essential in minimizing the potentially fatal outcomes of Allergic Fungal Rhinosinusitis.



1232

Middle turbinate oedema in allergic rhinitis

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Poster Session | Allergic Rhinitis | 18 June – 22 June, 2023, All day

Objective: The association between allergic rhinitis (AR) and middle turbinate oedema has been described however, to date no studies have used the same endoscopist nor the same method of allergy testing.

The aim of this study was to determine if there was an association between middle turbinate oedema and AR using a single clinician and an identical allergy test for all patients.

Methods: A retrospective assessment of all patients who underwent nasendoscopy by a single otolaryngologist. The middle turbinate was visualized for the presence of polypoid changes. Specific IgE immunoassay using radioallergosorbent test (RAST) was then performed on all patients.

Results: Nine patients of 40 (22.5%) were classified as RAST positive and middle turbinate oedema positive. Eleven patients (27.5%) were classified as RAST positive and middle turbinate oedema negative. One patient (2.5%) was defined as RAST negative and middle turbinate oedema positive. Nineteen patients (47.5%) were defined as RAST negative and middle turbinate oedema negative. The sensitivity of middle turbinate oedema for AR was 45% and the specificity was 95%.

Conclusion: This study supports the association between middle turbinate oedema and AR. It found oedema of the middle turbinate to be poorly sensitive but highly specific for the presence of AR.

Benign nasal tumours

1165

managing Pain in benign nasal tumor subjects

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¹SFCCP

Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Background:When assessing QOL parameters of Benign-nasal-tumor, pain is very commonly observed. No uniform approach on pain management. Ayurveda-Therapy highly preferred by Asian-patients. Cultural/psychological/spiritual/social factors influence quality-of-life (QOL). Current approach:work-up of pain in individual with nasal tumor subjects begins with thorough pain assessment. But very few clinics have specialized pain-care-team in rural areas.Past studies/experiences: management of pain due to Benign-nasal-tumor requires sound understanding of therapy, primary categories of analgesics include non-opioids, opioids, adjuvants. wide variety of non-opioids medications as anticonvulsants, antidepressants, corticosteroids, local anesthetics also tried. therapy –with Ayurveda & spirituality/psycho-social-support emerging new hope pain management. Spiritual well-being prevents depression. Effect of spiritual/psycho-social-community support fertile ground for further investigations in larger sample size.**Methods:**N= 53 [patients with completed Rx for Benign-nasal-tumor] having intractable pain due to nas. Score on pain perception before & after treatment noted. Any optional alternative therapy treatment [complimentary-medicines] taken noted. QOL analyzed. **Result & Conclusions:** 85% preferred Asian complimentary/Ayurveda therapy compared to allopathic-medicines.> participants felt pain due to Benign-nasal-tumor is distressing. comprehensive pain assessment strategy needed



1166

Reducing tobacco smoking to reduce incidence of nasal tumors

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¹SFCCP

Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Objectives:Tobacco major cause of Nasal-tumors. Adolescents highly susceptible to tobacco-use. Aim was to reduce use of crude tobacco products. **Methods:** cross-sectional project. Retrospective analysis of implementation of FCTC-WHO done. N=260 seven targeted villages. Due representation to demographic pattern, socio-economic criteria. , age group of 14-24. Traditional faith-healers mobilized by community leaders[total 13]. Tobacco addicts graded clinically Traditional faith healers conducted 11 follow up sessions during course of study.**Results:**Of total 260 tobacco users 250 continued to participate. [10 dropouts].227 showed positive-attitude towards quitting tobacco use. 215 subjects has quit habit of tobacco use. 12 subjects able to abstain for short period but eventually restarted habit. Post-project surveillance showed need for community help/Rehabilitation. Of 227 who responded positively majority [220] started using tobacco due to peer-pressure [84%], imitation of tobacco advertising [11%].**Conclusions:**scientific knowledge & expertise of traditional faith healers is tribal areas controversial, they are only available resource for influencing adolescents. this model can reduce incidence of nasal-tumors turning into carcinomas. **Recommendations:**Developing nations have little resources & technologies. we patients advocates need ERS-2023 platform to interact and learn from seniors.



1249

Our experience in the treatment of patients with inverted papilloma of the paranasal sinuses

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Introduction: Inverted papilloma is a benign epithelial tumor that belongs to Schneider's sinonasal papilloma. The incidence of inverted papilloma is from 0.4% to 7% of all neoplasms of the nasal cavity and paranasal sinuses. **Objective:** To summarize the results of diagnosis and treatment of patients with inverted papilloma of the paranasal sinuses. **Materials and methods:** The data of radiological examination methods were analyzed and the results of treatment of 41 patients with paranasal sinus papilloma for 2018-2022 were evaluated. **Results:** Inverted papilloma was more common in the ethmoid cells – in 21 (51.2%) patients and in the maxillary sinus – in 14 (34.1%). In the area of the frontal sinus – in 5 (12.2%) of the examined patients. In one patient (2.4%), the inverted papilloma originated from the sphenoid sinus and spread ipsilateral to the posterior cells of the ethmoid cells. In the treatment of patients, endoscopic endonasal approach was applied. Recurrence of inverted papilloma was diagnosed in 7 (17.1%) patients, with a mean time of recurrence of 14 months. **Conclusions:** A comprehensive determination of pathognomonic radiological signs and the choice of the most optimal tactics of surgical treatment allows achieving satisfactory postoperative results and reducing the incidence of relapses.



1367

The case of patient with large osteoma of frontal sinus

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Osteoma is common benign tumor frequently arising in paranasal sinuses. It can be symptomatic, however usually it is diagnosed incidentally during a Ct scan of paranasal sinuses in patients with chronic rhinosinusitis. A 58-year old male patient with occasional headaches and chronic rhinosinusitis symptoms was examined in our Clinic. The computed tomography of paranasal sinuses was ordered and revealed large hyperdense osseous lesion of right frontal sinus as well as bilateral thickening of mucosa in frontal, ethmoid and maxillary sinuses. The modified Lothrop procedure was performed and lesion of frontal sinus was removed. Histopathology results confirmed osteoma. The patient had 10 years follow up.



1419

JUVENILE NASAL ANGIOFIBROMA IN A PATIENT TREATED WITH GROWTH HORMONE

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

INTRODUCTION: Juvenile nasal angiofibroma (JNA) is a rare, benign tumor of vascular etiology with a tendency to bleeding and local aggressive behavior. Key to its development are the expression of vascular endothelial growth factor (VEGF), insulin-related growth factor (IGF-I), as well as receptors for steroid hormones. **MATERIAL AND METHODS:** A 15-year-old male patient with a history of GH treatment due to familial short stature. His symptoms were nasal respiratory failure and epistaxis, with a year evolution and no response to conservative treatment. On examination, a hypervascular mass was detected that obstructed both nostrils with extension to the cavum. **RESULTS:** Computed tomography (CT) and magnetic resonance imaging (MRI) described a lesion consistent with Radkowsky's ANJ IIC or Fish's IIIA. Given the findings, an endonasal endoscopic approach guided by neuronavigation was decided for resection of the tumor, prior to its embolization. The pathology revealed angiofibroma. **DISCUSSION:** Despite the lack of bibliography that supports the relationship between ANJ and GH, hormonal stimulation of the receptors that are expressed in this tumor is a factor to take into account in its etiopathogenesis. Therefore, it is essential to know them for early detection.



1440

Antrochoanal polyp - extension to the larynx: a case report

Tamara Tačigin, Gorazd Poje

Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Antrochoanal polyp (ACP) is a benign lesion originating from the mucosa of the maxillary sinus, growing and protruding to the nasal cavum, and then posteriorly toward choana and nasopharynx. The most common presenting symptom of ACP is unilateral nasal obstruction. ACP represents 4-6% of all nasal polyps in general population, but it constitutes 33% of all nasal polyps in children. In this case report we present a 6 years old boy with a 1,5 year history of nasal obstruction, snoring, obstructive sleep apnea, and foreign body sensation in the throat. Endoscopy showed a polypous mass in left nasal cavum that extended from fontanelle defect to the choana and nasopharynx, and intraorally solid soft mass that was bulging soft palate and behind the uvula extended below the superior edge of epiglottis. Diagnosis of ACP was supported by CT and confirmed by histopathologic analysis. The treatment of ACP is always surgical. Caldwell Luc procedure that was preferred in the past was replaced with endoscopic sinus surgery. ACP should be considered in the differential diagnosis of unilateral nasal obstruction, particularly in children. During surgery the exact origin of ACP in maxillary sinus must be detected in order to prevent recurrence.

1529**Dentigerous cyst mimicking "fungus ball"**

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

We present a case report of a 60 years old patient who came in the ER having signs and symptoms of acute rhinosinusitis, for about 10 days. Clinical examination begun with nasal endoscopy, finding nasal polyp and pus secretions flowing out of the middle meatus in the right nasal cavity. Following those findings, a CT scan was performed showing abundance in the right maxillary sinus, with calcinosis and the presence of dental inclusion, therefore fungal sinusitis was taken under consideration. Further examination with an MRI was made, confirming the imaging findings of fungal rhinosinusitis. Our team operated the patient with F.E.S.S.. During the operation bony tissue was localized inside the lateral wall of the right maxillary sinus at the sight of the ostium, making it hard to open. A maxillary antrostomy was performed through the inferior meatus, by removing part of the inferior turbinate. Tissues obtained from the inside of the right maxillary sinus were sent for biopsy and pathophysiology examination. Results of these tissues examination showed squamous epithelium. By connecting those pathology results with the dental inclusion inside the maxillary sinus, the diagnosis of a dentigerous cyst was made. Our patient was sent and advised for further maxillofacial treatment.



1548

Inverted Papilloma of the Lacrimal Sac – A Rare Incidental Finding on a PET-CT Scan

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Inverted papilloma (IP) originating primarily from the lacrimal drainage system is extremely rare. Although a benign tumour, there is a propensity for recurrence and malignant transformation with few cases reported in the literature. Surgical excision is the mainstay of treatment. A 56-year-old male smoker with chronic left epiphora and a mild, painless swelling on the left medial canthus since 15 years, presented to our department, complaining of a soft, painless lump on the left parotid area since one month. A thorough head and neck examination with skin inspection and cranial nerve examination did not reveal any significant findings. A cytological diagnosis of squamous cell carcinoma (SCC) of the parotid was made after FNA biopsy. A PET/CT scan was requested to exclude intraparotid lymphnode metastasis, which showed a hypermetabolic lesion on the left parotid with SUVmax: 6.8 and a 1.5 cm lesion on the left nasolacrimal sac with SUVmax: 10.9. The patient underwent left total parotidectomy with elective neck dissection and an endoscopic biopsy of the left lacrimal sac with standard endoscopic DCR procedure at the same sitting. Histopathology confirmed a HPV+ IP of the lacrimal sac and parotid and neck specimens were reported as primary SCC of the parotid, staged as pT2N0M0. The patient underwent adjuvant radiotherapy and he did not consent for definitive surgical excision. FDG-avid lesions on PET/CT should be promptly investigated with biopsy. Lacrimal IP demonstrated marked hypermetabolic activity consistent with previous reports in the literature.



1555

TRIGEMINAL NEURALGIA DURING AIRPLANE FLIGHTS

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

A 56-year-old man who came to the office because of the appearance of pain in the right side of the face during plane flights for several months. The patient had no symptoms suggestive of chronic sinusitis. A nasofibroscope was performed without pathological findings, so a MRI was requested, with the following findings: Extensively pneumatized sphenoid sinus associated with pneumatization of the pterygoid processes and clivus. Occupation of the right side of the sphenoid sinus, hyperintense on T2 and hypointense on T1, minimally expansive, protruding towards the ipsilateral maxillary sinus. A mucocoele was suspected. Then a CT scan was requested. The patient underwent endoscopic excision of the lesion and the symptoms disappeared. Radiological images and surgical intervention are provided.



1588

Plasma cell granuloma of the inferior turbinate - a rare entity

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Introduction Plasma cell granuloma is a non-neoplastic proliferation of plasma cells. It commonly involves the lungs and the oral cavity. However, the involvement of the nasal mucosa is rare. We present a case of plasma cell granuloma involving the inferior turbinate in an adult. **Case Report** A 65-year-old man presented with a several-month history of fixed right nasal obstruction, occasional epistaxis, and clear nasal discharge. Examination revealed an irregular polypoid mass lesion, macroscopically heterogeneous, with apparent implantation on the right inferior turbinate and occluding the nasal fossa. The CT scan revealed a space occupying lesion in the right nasal fossa at the level of the head of the inferior turbinate, without any suspicious features of malignancy. The patient underwent endoscopic removal of the lesion, and the histopathologic report revealed a polyclonal population of lymphocytes, CD38+/CD34-, confirming the diagnosis of plasma cell granuloma. **Discussion** Plasma cell granuloma of the nose and paranasal sinuses is a rare occurrence. Surgical treatment remains the preferred option, although corticosteroid therapy and radiotherapy have been used with a limited degree of success. Despite its clinical similarities to a malignant process, it should be differentiated from such diseases by thorough histopathologic and immunohistochemical evaluation.



1683

Frontal Sinus obliteration for mucocoele in the endoscopic era

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Background: Paranasal mucocoeles are benign, epithelium lined cysts filled with mucoid material. They usually behave like space-occupying lesions, and may cause bone erosion and displacement of surrounding structures. Frontal sinus is most commonly involved, and computerized tomography (CT) together with magnetic resonance imaging (MRI) are sufficient for diagnosis, and surgical planning. Depending on specific characteristics, frontal mucocoeles are managed either by endoscopic transnasal, or by external approach. **Methodology/Principals:** A 53 years-old male, presented in the outpatient ENT clinic of a tertiary referral center complaining of left upper eyelid swelling and intermittent double vision. He was operated twice for frontal sinus mucocoele elsewhere endoscopically. New CT and MRI were conducted which revealed a frontal mucocoele with erosion of the floor, the inferior and posterior wall of the sinus. **Results:** Osteoplastic frontal sinus obliteration with autogenous abdominal fat was chosen in this case. Postoperative course was uneventful. Patient completely recovered from diplopia, exophthlmo, and frontal swelling. **Conclusions:** Despite the evolution of advanced endoscopic techniques for frontal sinus surgery, open surgery remains a valid procedure in cases where endoscopic approach has failed, with orbital and/or intracranial extension, and where district anatomy is unfavorable for a purely endonasal approach.



1695

CLINICAL PRESENTATION OF FIBRO-OSSEOUS BENIGN TUMOURS: HOSPITAL CASE REPORT SERIES

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Introduction: Fibro-osseous benign lesions of the paranasal sinuses are slow-growing tumours characterised by the replacement of normal bone by a fibrous cellular stroma, with variable quantity of bony content. These lesions are divided into three different entities: osteoma, fibrous dysplasia (FD) and ossifying fibroma (OF), in this order of frequency. Osteoma most frequently occurs in the frontal and ethmoidal sinuses, while FD and OF mostly involve the maxilla. Normally these lesions are asymptomatic and incidentally found on imaging done for another reason. Nevertheless, it can occur extra sinus complications, such as orbital or intracranial involvement. When there is a surgical indication, the endoscopic approach is a safe and effective treatment modality, and the prognosis is good. **Case Report:** In order to further deepen the understanding of fibro-osseous lesions, we aim to present three different case reports, one for each clinical entity. Therefore, describing the clinical presentation, diagnosis and treatment. **Conclusions:** Fibro-osseous benign lesions share several similarities in clinical and imaging manifestations, but their clinical behaviour is diverse. There is still unclear whether to choose or not a surgical approach. Keeping that in mind, it is possible to understand the relevance of sharing clinical information between different realities.



1701

Giant Rhinophyma : A rare case report

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Giant rhinophyma : a rare case report Background: Rhinophyma is a disfiguring nasal deformity due to the proliferation of sebaceous glands and underlying connective tissue. Methodology/Principals: A 74 years-old male, presented in the outpatient ENT clinic of a tertiary referral center due to a huge mass causing nasal deformity. Patient reported respiratory issues, and psychological distress. The mass was obstructing both nostrils, expelled sebum when pressed upon. Patient underwent laser CO2 partial thickness tissue removal for rhinophyma. Meticulous wound care with petroleum gel gauze soaked in antibiotic cream as wound dressing was utilized post operatively. Results: The histological examination confirmed the clinical diagnosis. Significant aesthetic improvement was noted immediately and three months post surgery. Conclusions: Rhinophyma is nowadays a rare disfiguring skin condition which if left untreated has a significant social isolating effect. Pathophysiology of rhinophyma has still not been completely elucidated, although rosacea is considered a precursor condition of the disease. The principal aim of surgery is to reduce the hypertrophied sebaceous glands and re-contour the nose. This can be achieved using a wide variety of techniques. Additionally scarring, and nasal cartilages destruction should be avoided at all costs.



1702

INVERTED PAPILLOMA OF THE FRONTAL SINUS WITH PROPTOSIS: A RARE CASE-REPORT

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Introduction: Inverted papilloma (IP) is a benign sinonasal epithelial tumor that is characterized by its locally aggressive nature, elevated recurrence rates and considerable risk of malignant transformation. Frontal sinus involvement is relatively rare and is associated to higher rates of recurrence. **Materials and Methods:** Case report and review of the literature. **Results:** A 38 year-old black woman presented to our institution with left eye proptosis for one year, ipsilateral epiphora, purulent nasal discharge and left frontal headache. Nasal endoscopy revealed a polypoidal mass in the left nasal cavity. Computed tomography, magnetic resonance and initial biopsy suggested an IP of the frontal sinus. The patient was submitted to a draft type IIa frontal sinusotomy associated to frontal sinus trephination. The posterior histologic examination confirmed the suspected diagnosis. Two months later, a magnetic resonance showed residual disease, which motivated a more aggressive re-intervention with an osteoplastic flap procedure combined with endoscopic approach. Orbital decompression was not advised since the ocular function was preserved and there was a considerable risk of recurrence demanding re-intervention. **Conclusions:** IP of the frontal sinus demand an highly differentiated surgical approach. Prolonged surveillance is strongly advised considering the risk of recurrence and metachronous carcinomas.



1743

Nasal glial heterotopia: a systematic review of the literature and case report

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Poster Session | Benign nasal tumours | 18 June – 22 June, 2023, All day

Nasal glial heterotopia (NGH) is a rare congenital, non-neoplastic displacement of cerebral tissue in extracranial sites. Together with a case report of NGH, we present the first systematic review of all published cases in order to summarise the relevant clinical findings and appropriate therapy, making the available evidence accessible to decision makers. A total of 72 original publications including 152 NGH cases were identified. The male:female ratio was 3:2. Most patients were children under 18 years (130 patients) and only 8% of cases were diagnosed in adults. The main clinical presentation forms were asymptomatic masses around the nasal root as well as nasal congestion. Magnetic resonance imaging was performed in 39% of patients, computed tomography in 22% of patients and a combination of both in 20% of patients. A diagnostic biopsy was performed in only 7 patients. All patients underwent surgical treatment and recurrence was reported in 14 patients within the first year of follow-up. In conclusion, NGH should be considered as a differential diagnosis of nasal masses in children. MRI is mandatory in order to exclude a connection to the central nervous system. Complete resection is curative treatment.

1799

Case of 69 years old patient with

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Poster Session | Benign nasal tumours | 19 June – 22 June, 2023, All day

Nosebleeds, shortness of breath, loss of smell led the 69 years old patient to "Nairi" MC, Yerevan. After appropriate examinations, the patient was diagnosed with very rare disease-sinonasal inverted papiloma (Schnider's papiloma). Papilloma is a benign neoplasm of the nasal cavity, which has a tendency to relapse and malignancy. The causes of occurrence are diverse, from the presence of human papillomavirus to chronic purulent rhinosinusitis. A papilloma may not bother the patient for a long time, although, one day it may show up. The location of its appearance may also vary. In the case of 69 years old patient also, papiloma was located in the left part of nasal cavity, spread to ethmoidal recesses and maxillar sinus and had quite big dimensions. In general, such neoplasms can spread to the cavities adjacent to the nose, the orbit, destroying the surrounding tissues. Under the lead of "Nairi" MC ENT doctor L. Torosyan, the rare tumor has been completely removed. In few days after the operation patient's breathing was restored. It's important to note, that extraction of this tumor requires a lot of experience and professional skills.



CRS – diagnosis and investigations

1661

Reflux Finding Score (RFS) and PepsinA in Patients with Chronic Rhinosinusitis (CRS) due to Laryngopharyngeal Reflux (LPR).

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Poster Session | CRS – diagnosis and investigations | 19 June – 22 June, 2023, All day

Background and objectives: The incidence of Laryngopharyngeal reflux (LPR) disease is still being debated and is suspected to be one of the causes of chronic rhinosinusitis. Exposure to acidic refluxate and pepsin in the upper esophageal area is suspected of causing prolonged inflammation of the nasal and paranasal sinuses mucosa. Reflux finding score (RFS) assessment using Fiber Optic Laryngoscopy is still used today and can assist in diagnosing LPR. The presence of pepsin can also be the main biomarker in LPR, considering that pepsin is only produced in gastric parietal cells. This study aimed to see the correlation of pepsin findings as a biomarker in patients with RFS>7 diagnosed with CRS. **Methods:** This study is a prospective cross-sectional analysis using the Fisher exact test. All subject's symptoms of rhinorrhea and or nasal obstruction for more than 12 weeks will be included in the study. Nasal endoscopy (NE), fiber optic laryngoscopy (FOL), and Reflux Symptom Index (RSI) were performed on all subjects. All subjects were taken specimens using a single nasal lavage at mealtime, then analyzed with a rapid pepsin test device. **Results:** In this study, 25 patients with CRS and 28 patients were diagnosed with LPR out of 35 patients. While statistical findings showed positive pepsin results in 22 samples with a value of $p=0.027$ ($p<0.05$). **Conclusion:** Pepsin can be a biomarker in patients with RFS>7 diagnosed with CRS.

**1252****Determination of the influence of transferred SARS-CoV-2 on the course of chronic polyposis rhinosinusitis with aspirin-associated respiratory disease****Diana Zabolotna¹, Liudmyla Zabrodska², Ivan Moldovanov¹**

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Poster Session | CRS – diagnosis and investigations | 18 June – 22 June, 2023, All day

It is not known whether SARS-CoV-2 affects the course of chronic rhinosinusitis with nasal polyposis (CRSwNP) with aspirin-associated respiratory disease (AERD). Purpose of the study. To differentiate symptoms of chronic CRSwNP from AERD at questionnaire level, to study impact of SARS-CoV-2 on the course of disease. Materials and methods. A survey of 125 patients was conducted, from which 50 CRSwNP patients with AERD aged 20-60 years (28 men and 22 women) were selected. The questionnaire was developed in form of a Google form, which was built on basis of SNOT-22 questionnaire for identifying nasal symptoms. Results. On basis of conducted study: for CRSwNP with AERD, bilateral nasal congestion 58%, moderate nasal discharge 50%. Hyposmia was noted in 74%. Studying impact of COVID-19 on CRSwNP with AERD, following results were obtained: among those surveyed, 58% had a history of SARS-CoV-2, and in 50% of cases this worsened symptoms. Conclusions. Result of conducted study, main nasal symptoms CRSwNP with AERD was depicted in percentage. Correlation was found between a history of SARS-CoV-2 disease and worsening of symptoms.



1406

Assessment of the expression levels of the MMP-12 in chronic rhinosinusitis with nasal polyps

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Poster Session | CRS – diagnosis and investigations | 18 June – 22 June, 2023, All day

Background: Chronic rhinosinusitis with nasal polyps (CRSwNP) is a chronic inflammatory condition of the nasal mucosa and paranasal sinuses associated with frustrating symptoms and low quality of life. The aim of this study was to assess the expression of matrix metalloproteinase-12 (MMP-12), a pivotal regulator of the pathophysiology of several inflammatory diseases, in patients with CRSwNP.

Methods: Tissue samples from 37 patients with CRSwNP treated with functional endoscopic sinus surgery and 12 healthy mucosa specimens (control group) were excised intraoperatively. Real-time polymerase chain reaction and Western blotting were used to measure the mRNA and protein expression levels of MMP-12, respectively.

Results: mRNA levels of MMP-12 were found considerably increased in the CRSwNP tissue samples compared to those determined in the control group. As far as the protein levels, a non-statistical significant elevation trend was noticed. The “discrepancy” in the expression profile among mRNA and protein levels could be attributed to post-translational gene expression regulation.

Conclusion: The raise of MMP-12 in patients with CRSwNP could straighten its potential implication in the pathogenesis of the disease. Our results indicate that MMP-12, in combination with other matrix metalloproteinases, may serve as a biomarker and therapeutic target for nasal polyposis.

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Baseline characteristics of dupilumab-treated patients with chronic rhinosinusitis with nasal polyps from a real-world non-interventional study in Germany (ProGNOSE)

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Poster Session | CRS – diagnosis and investigations | 18 June – 22 June, 2023, All day

Introduction: Dupilumab is the first biologic approved for the treatment of severe, uncontrolled chronic rhinosinusitis with nasal polyps (CRSwNP) in adults. ProGNOSE is an ongoing, prospective observational study in Germany, aiming to evaluate long-term effectiveness and safety of dupilumab treatment in adult patients with CRSwNP in a real-world setting. Here, we present baseline data from patients included during the first year. **Methods:** Patient demographics, disease characteristics and medical history were documented using electronic case report forms and patient questionnaires at baseline visits. Clinical records were included based on availability, individual practice and clinical routine of the study site. **Results:** For this interim analysis, 42 patients (men: 24; women: 18) who had completed baseline visits were included. Mean±SD age was 53.14±11.02 years and disease duration was 14.51±9.58 years. Mean±SD NPS (4.92±1.44), NCS (2.15±0.93) and VAS (76.44±26.58) indicated severe disease in these patients. Anosmia/hyposmia patients (71.4%/25%) and patients with type 2 comorbid conditions (76.2%) were of majority. Mean±SD SNOT-22 (51.88±20.58) and CRS-PRO (26.66±9.63) showed impaired HRQoL. **Discussion:** Patients included in ProGNOSE during the first year had uncontrolled disease with high symptom burden and impaired QoL prior to initiating dupilumab. ProGNOSE data will contribute to a better understanding of standard-of-care biological treatment of CRSwNP in Germany.

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Relationship between maxillary fungal sinusitis and odontogenic infection, dental implant.

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Poster Session | CRS – diagnosis and investigations | 18 June – 22 June, 2023, All day

Introduction The aim of this study was to investigate the association between chronic fungal sinusitis and odontogenic infection, dental implant. **Materials & methods** We retrospectively reviewed medical records and PNS CT scans. All patients were pathologically diagnosed with fungal sinusitis, and based on PNS CT scan, a total of 396 maxillary sinuses were reviewed for dental implants and dental problems (periapical abscess, periodontitis, tooth extraction). **Results** We defined two groups of maxillary sinuses according to the presence of fungal ball (fungal group; n=204 vs normal group; n=192). Pathologic diagnosis was fungal sinusitis in all 204 cases. In the normal group, mean MS volume was 17.0 ± 6.2 ml. In the fungal group, mean MS volume was 13.8 ± 5.2 ml. The volumes of MS were statistically small in the fungal group ($P < 0.001$). In 141 (69.1%) of 204 sinuses in the fungal group, findings suggestive of odontogenic infection were confirmed on PNS CT scans and were statistically significant. ($P < 0.001$, odds ratio = 2.537). 26 (12.7%) of 204 sinuses in the fungal group had dental implants and were not statistically significant. ($P = 0.107$, odds ratio = 1.724). **Conclusion** This study suggests odontogenic infection is a risk factor for developing fungal sinusitis in the ipsilateral maxillary sinus.

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Identifying a sphenoid sinus fungus ball using a nomogram model

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Poster Session | CRS – diagnosis and investigations | 18 June – 22 June, 2023, All day

Background: Sphenoid sinus fungus ball (SSFB) is a rare entity and usually presents with non-specific symptoms. SSFB could potentially lead to serious orbital and intracranial complications. Computed tomography (CT) scan is usually the first imaging test of the diagnostic workup in patients with specific clinical symptoms. This study aimed to compare the clinical characteristics and CT features between SSFB and unilateral (non-fungus ball) chronic sphenoid rhinosinusitis (USRS) and help differentiate between these two most common inflammatory diseases of the sphenoid sinus. **Methods:** By retrospective database review, 66 patients with a histopathologic diagnosis of isolated SSFB were recruited for analysis. Fifty-four patients who underwent endoscopic sinus surgery with clinical and histopathological diagnoses of USRS were enrolled as the control group. Clinical characteristics and CT features were evaluated. **Results:** Headache, rhinorrhoea, nasal obstruction, postnasal dripping, and hyposmia were the most common symptoms in both groups. In the univariate analysis, older age, lower white blood cell counts, irregular surface, bony dehiscence, lateral wall sclerosis, and intralesional hyperdensity (IH) were significant predictors for SSFB. Older age, irregular surface, and IH remained statistically significant in the multivariate analysis. Based on the results of the regression analysis, a nomogram for predicting the probability of SSFB was plotted. **Conclusions:** We developed a nomogram model as a novel preoperative diagnostic tool for identifying SSFB according to the pred

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Differentiating features of fungal mucin and allergic mucin on CT imaging of the sinus

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Poster Session | CRS – diagnosis and investigations | 18 June – 22 June, 2023, All day

Background: Fungi within the sinus has the typical CT finding of hyper-densities, deriving from the presence of manganese, iron and other paramagnetic elements related to fungal hyphae. While this is readily recognisable in pathology like fungal mycetoma, the findings are typically less pronounced in allergic fungal sinusitis (AFS) where 'serpiginous areas of high attenuation' can also be attributed to highly proteinaceous 'fungal mucin'. Another severe subgroup of CRS, eosinophilic mucin rhinosinusitis (eCRS) has similar mucinous traits to AFS, with comparable radiological changes. Method: We undertook a retrospective series of 40 cases of CRS to identify defining radiological traits between fungal and non fungal CRS subtypes (AFS 10, non-allergic fungal CRSwNP (FRS) 10, eCRS 10, mycetoma 10). We reviewed pre operative CT scans to calculate the distribution, mean, median and peak attenuation. Results: Mean peak attenuation was highest in the mycetoma group (280.6 Hounsfield Units HU) which was significantly higher than AFS (135.9 HU), eCRS (135.2 HU) and FRS (160.9), which all had comparable results. Mean attenuation for the affected sinus was comparable between the AFS, eCRS and FRS groups, while mycetoma was significantly higher. Lund-McKay scores (LMS) were higher in the eCRS group relative to AFS and FRS. Conclusion: Attenuation and pattern of densities was highly comparable between fungal (AFS and FRS) and non-fungal mucin (eCRS). eCRS was invariably bilateral with higher LMS scores which may serve as a useful differentiation between AFS / FRS.



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Chronic rhinosinusitis: is there a correlation between serum and tissue eosinophilia?

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Poster Session | CRS – diagnosis and investigations | 18 June – 22 June, 2023, All day

Introduction: Chronic rhinosinusitis with nasal polyps (CRSwNP) is an inflammatory disease of the nose and paranasal sinuses with multiple endotypes and phenotypes. There is a special interest in classification of the eosinophilic chronic rhinosinusitis, which has grown lately due to the immunobiologic drugs. The criteria most used is the EPOS criteria: 10 or more eosinophils per high-power field (eos/HPF) in a tissue biopsy. However, there are still controversies to determine the more accurate criteria to define the eosinophilic CRS. **Methods:** Retrospective clinical study, with 220 patients with CRS (CRSwNP) from our institution, who were submitted to nasal biopsy in the office or operation room (OR) from 2009 to 2019. Tissue and serum eosinophilia were quantified and after compared to pulmonary disease, polyps relapse and radiologic score. **Results:** The median of the tissue eosinophilia was 64 eos/HPF (OR) and 49 eos/HPF (office) and serum eosinophilia 320 eos/mm³. There was a positive correlation between serum eosinophils and tissue eosinophils from surgical biopsy. After a sensitivity analysis the preoperative use of oral corticosteroids did not affect the results. The ROC curve did not show high sensitivity and specificity between serum or tissue eosinophilia and polyps relapse. There was a positive correlation between pulmonary disease and serum eosinophilia, however there wasn't any other correlation between the variables and the eosinophilia.

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A case of bilateral heterochronic fungal rhinosinusitis suspected to be *Schizophyllum commune*

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Poster Session | CRS – diagnosis and investigations | 18 June – 22 June, 2023, All day

Schizophyllum commune is a mushroom known to infect humans and is a microorganism belonging to the fungal family that is ubiquitous in Japan. It is frequently reported as an allergic bronchopulmonary mycosis and is second in frequency only to *Aspergillus* spp. Some cases have also been reported in the nasal sinuses, mainly in Japan. A 55-year-old female, visited a general hospital in June 20XX-2 with a chief complaint of left posterior rhinorrhea. CT scan showed hyperintense areas in the posterior ethmoid bone and sphenoid sinus. She underwent endoscopic sinus surgery under general anesthesia at our hospital in April 20XX. A fungal ball was found in the posterior ethmoid and sphenoid sinus. Pathologically, the fungal ball was accompanied by calcification and was suspected to be *Aspergillus*. In April 20XX+3, the patient returned to his previous physician with right rhinorrhea, the opposite side of his previous condition. In October 20XX+3, a CT scan showed hyperintense areas in the right ethmoid sinus and sphenoid sinus. In February 20XX+4, she underwent endoscopic sinus surgery under general anesthesia. A fungal ball was found in the right posterior ethmoid and sphenoid sinuses. Culture showed mushroom growth on a petri dish. On MALDI, *Schizophyllum commune* 1024 score was 1.89. The left fungus was not cultured, so it cannot be confirmed, but the course of the case was thought to be bilateral heterochronic fungal rhinosinusitis. The residence was a house deep in the mountains, and environmental factors were speculated to be involved in the development of this case.

CRS – medical management

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The effect of the premedication with systemic corticosteroids and antibiotics on inflammation and intraoperative bleeding during sinonasal endoscopic surgery for chronic rhinosinusitis with nasal polyps (CRSwNP)

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Poster Session | CRS – medical management | 18 June – 22 June, 2023, All day

Introduction: Chronic rhinosinusitis with nasal polyps (CRSwNP) is a disease characterized by a variety of inflammatory mechanisms. Extensive genetic analyses have shown that among the molecules that are involved in its genetic base, interleukins (ILs) play a critical role in development and progression of CRSwNP. Interleukins, such as IL-4 (5q31.1), IL-5 (5q31.1), IL-13 (5q31.11) and IL-25 (14q11.2) are found to be overexpressed. **Purpose:** Our aim is to investigate, through a systemic review, the effect of the premedication with systemic corticosteroids and antibiotics on inflammation and intraoperative bleeding during sinonasal endoscopic surgery for chronic rhinosinusitis with nasal polyps. **Material and Methods:** The search period covered January 1979 to February 2021, using the scientific databases PubMed, ScienceDirect, Scopus, Cochrane Library and Google Scholar. Search terms were "effect, premedication, systemic corticosteroids, antibiotics, intraoperative, bleeding, inflammation, sinonasal, endoscopic surgery, chronic rhinosinusitis, nasal polyposis". **Results:** From an initial eighty titles found in the above medline databases, the evaluations led to the final inclusion of fifteen papers. Eighty titles found in the above medline databases. Eleven titles were excluded as they did not include a summary and full text in English language. Sixty-nine titles collected and duplicate references were searched. Twelve titles were excluded due to double reporting. Fifty-seven articles remained for systematic review. Forty-two articles were excluded after systematic review and correlation with the research field. Fifteen articles were eventually included in the literature review. **Conclusions:** The effect of corticosteroids and antibiotics on the size of nasal polyps, nasal symptoms and systemic markers of inflammation is significant. Each of the above factors acts on different pathogenetic inflammatory mechanisms. The use of perioperative corticosteroids reduces blood loss and operation time and improves the quality of the surgical field. There are no other medications that have been shown to improve the surgical field and outcome. Whether there is an additive effect on systemic corticosteroids on top of nasal corticosteroids is unclear. The EPOS steering group advises to use (nasal) corticosteroids before endoscopic sinus surgery. However, it should be considered in future studies whether some minor differences are due to differences in the initial doses of corticosteroids or during treatment in the preoperative period. It is worth mentioning that while high doses of corticosteroids are required to control the progression of rhinosinusitis with nasal polyps, the optimal initial dosage and the total duration of the treatment have not yet been standardized in patients with CRSwNP and future studies are required to determine the two above parameters (optimal dosage and duration of treatment). There are, therefore, known risks from corticosteroid administration, and clinicians should consider them when evaluating each patient. Each patient should be considered as an individual case with individualized treatment.

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Use Of Complementary Indian Medicine In chronic rhinosinusitis (CRS)

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Poster Session | CRS – medical management | 18 June – 22 June, 2023, All day

Introduction: patients of chronic rhinosinusitis (CRS) needs price discounted drugs & proper nursing care. Appropriate public health program incorporating NGO's in healthcare set-up are necessary. Our-NGO used locally-available Complementary –Indian-Medicines [CAM] for providing home-based-care. **Aims:** 1. provide CAM as supportive therapy 2. Evaluate cost-efficacy/responses of CAM . 3. Develop policy paper **Method:** 217 patients of CRS included, age 30-60 years enrolled. 60% females, 40% males. 80% returned to villages after prolonged therapy in city hospitals on allopathic-drugs. subjects treated with Bach-flower remedy 40%, Accupressure/Accupuncture 57%, Hydrotherapy 24%, Hypnotherapy 75%, ayurvedic-therapy 82%, 26% Unani Medicines, 61% Homeopathic-medicines, 72% on Herbal-Oil-TFH massage -therapy, 58% Aromatherapy. 8 sessions CAM. feedback Performa responses evaluated. Sneezing/Rhinorrhea recorded scale of 1-10. mean score pain fell from 8.2 (SD 1.4) to 3.8 (SD 2.7) point(p<0.001). Self report-questionnaire evaluated **Results:** Group-1 H1-blockers [n=60], Group-2 CAM [n=122], Symptom relief(n=90), Gr-1 preferred CAM to std drugs(n=95). CAM 52% cheaper compared to Allopathic medicines. CAM-available locally/high-acceptance. **Conclusion:** 184 patients preferred CAM. At ERS-2023 We unite with researchers from USA/Europe to develop this policy to exchange experiences/knowledge. **conclusion/Recommendations:** ERS must form common guideline manual on CRS. We graphically show our project to all participants



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Cycling Therapy for Eosinophilic Chronic Rhino-Sinusitis

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Poster Session | CRS – medical management | 18 June – 22 June, 2023, All day

Eosinophilic chronic rhino-sinusitis (eCRS) is refractory and recurrent even after surgical treatment, and is often difficult to treat. About 80% of patients with eCRS have asthma, and comprehensive control of upper and lower airway inflammation is important. Five biologics are currently indicated in Japan, of which dupilumab, an anti-IL-4/IL-13 receptor antibody, is the only one indicated for CRS W NP. However, all of the formulations have shown some efficacy in eCRS and given that many of the formulations are in international phase III trials, it is likely that in the near future the treatment of eCRS will involve the same issues of selecting and switching biologics as in the treatment of asthma. The advent of Dupilumab has marked a paradigm shift in the treatment of eCRS. Dupilumab's strong efficacy has been a relief to many patients with eCRS, which in our data is over 90% effective, but there are some low responder patients. In some cases, eosinophils are more involved and IL-4/IL-13 suppression is insufficient to control upper and lower airway inflammation. We report a case in which both asthma and eCRS were successfully controlled by systematically switching between anti-IL-5 and anti-IL-5R antibodies and anti-IL-4/IL-13 receptor antibodies.



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Relationship of lesion location to postoperative steroid use in eosinophilic chronic rhinosinusitis

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Poster Session | CRS – medical management | 18 June – 22 June, 2023, All day

Objectives: Eosinophilic chronic rhinosinusitis (ECRS) is known to recur after surgery. The treatment choice for recurrent ECRS, such as oral steroids or biological agents, must be chosen carefully, and identifying the lesion location may be helpful. This study aimed to evaluate the postoperative course of ECRS patients and assess the relationship between endoscopic lesion location and postoperative oral steroid use. **Methods:** Patients with ECRS who underwent bilateral endoscopic sinus surgery from April 2018 to March 2020 were divided into two groups based on the presence or absence of oral steroid use after surgery. We evaluated and compared the lesion location on endoscopic findings during surgery in these two groups: middle turbinate, middle meatus, superior turbinate, superior meatus, nasal septum, and sphenoethmoidal recess. **Results:** Eighty-eight patients were diagnosed histologically with ECRS (mean 48.98 ± 1.40 years, 67 males / 21 females), 23 patients were steroid-using, 65 patients were steroid-free. Patients with sphenoethmoidal recess lesions were significantly more likely to require steroids ($p=0.019$) after surgery. **Conclusion:** A sphenoethmoidal recess lesion may be a risk factor for requiring postoperative steroids. This finding calls for more appropriate use of steroids in the postoperative management of ECRS.



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Eosinophilic pneumonia caused by the treatment for chronic rhinosinusitis with nasal polyps.

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Eosinophilic pneumonia is related to eosinophils for their mechanisms. It occurred by infiltration of eosinophils to lung tissues. It is thought to be caused by medicines, fungi, parasites, and other agents, but the cause is often unknown. Chronic rhinosinusitis with nasal polyps (CRSwNp) is also eosinophil-related disease that is often associated with bronchial asthma, so it is important to keep in mind that the complications of lower respiratory tract lesions disease. This is one of the concepts of "Global airway disease" introduced in EPOS2020. Eosinophilic pneumonia is often associated with increasing of eosinophil, severe dyspnea without wheezing, and a strong pulmonary infiltration shadow. Although it is not easy for otolaryngologists to diagnose eosinophilic pneumonia associated with CRSwNp, which is a common complication of asthma, during COVID-19 epidemic. Dupilumab, an anti-IL-4/ IL-13 receptor antibody, has recently received attention for its high therapeutic effect in the treatment of CRSwNp. We have reported that Dupilumab inhibit the migration of eosinophils from blood vessels to the local tissues, resulting in a temporary increase of eosinophil in blood. There have also been scattered reports of eosinophilic pneumonia during Dupilumab administration. In this presentation, we report a case of eosinophilic pneumonia occurred during treatment of CRSwNp, then discuss significant points in treatment.



1330

A case of recurrent chronic eosinophilic pneumonia during dupilumab administration

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Poster Session | CRS – medical management | 18 June – 22 June, 2023, All day

Dupilumab (a humanized immunoglobulin-G4 monoclonal antibody) inhibits IL-4R α and suppresses the type2 inflammation. We need to administer it carefully, because it occurs an increase in blood eosinophil counts due to a decrease in local eosinophil counts, sometimes resulting in eosinophilic pneumonia or eosinophilic granulomatosis with polyangiitis. We report a case of recurrent chronic eosinophilic pneumonia during dupilumab administration. A 54 years old man (He had a history of eosinophilic pneumonia) started dupilumab administration because his nasal symptom worsened regardless of twice sinus surgery. The symptom showed steady improvement, the regular prednisolone (5mg/day) was gradually reduced by 1mg. However, at the six months after dupilumab administration, he came to the hospital with symptoms of cough, fever and phlegm. Chest Computed Tomography showed right airspace consolidation predominantly in peripheral region and the eosinophil counts in the blood were also markedly increased. Trans-bronchial lung biopsy also showed evident eosinophil infiltration in bronchoalveolar lavage and lung. The patient was diagnosed with eosinophilic pneumonia and received steroid pulse therapy. Finally, he recovered from these symptoms. We need to monitor the eosinophil trends and pulmonary symptoms when using dupilumab.

1344**Odontogenic maxillary sinusitis - case report**

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Poster Session | CRS – medical management | 18 June – 22 June, 2023, All day

Background: One of the sinus complications after tooth extraction is the insertion of the tooth root into the sinus. This can lead to odontogenic maxillary sinusitis, which accounts for 5-40% of all chronic sinusitis. Odontogenic maxillary sinusitis has similar clinical symptomatology compared to rhinogenic sinusitis. **Case report:** Case of a patient who was admitted to the Institute of Physiology and Pathology of Hearing in Warsaw due to chronic sinusitis, many months after tooth extraction. She reported pain in the projection of the maxillary sinus and nasal blockage. In CT scan, massive changes in the sinus and the tooth root in the lumen of the sinus. Treatment was based on endoscopic root removal. **Conclusion:** Endoscopic surgery of the paranasal sinuses is currently most often used to remove foreign bodies, displaced tooth roots and inflamed mucosa, while preserving the physiological function of the sinuses. The Caldwell-Luc access is now less commonly used and recommended for wider sinus access.



1713

Real-Life Experience of Monoclonal Antibodies in patients with Chronic Rhinosinusitis with Nasal Polyposis

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Poster Session | CRS – medical management | 18 June – 22 June, 2023, All day

GoalsThe goal of this study is to compare five different antibodies in terms of effectiveness regarding nasal symptoms and asthma.
Material and MethodsWe retrospectively analyzed the data of 15 patients treated with monoclonal antibodies. Previous history of nasal surgery, steroid use, blood eosinophilia, nasal polyp scores, SNOT-20, smell and asthma control were analyzed.
ResultsThe 15 patients have received a total of 30 different therapies with monoclonal antibodies. There is a positive effect of the monoclonal antibodies on asthma and chronic rhinosinusitis symptoms. In our study, there is a trend that dupilumab has the most pronounced effects on nasal symptoms. No major differences between mepolizumab and benralizumab were observed.
ConclusionOur analysis shows that most patients benefit significantly from the treatment. Dupilumab has the most pronounced effects on nasal symptoms in our study.



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BIOLOGICAL THERAPY IN THE TREATMENT OF PATIENTS WITH RSCPN; ARE THEY A REAL LIFE SAVE FOR OUR PATIENTS?

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Poster Session | CRS – medical management | 18 June – 22 June, 2023, All day

A retrospective study has been carried out, in which patients with CRScNP and asthma treated with biological therapy at the University Hospital of Fuenlabrada have been included. Biological treatments were administered to 21 patients who, in addition to suffering from severe asthma, presented CRScNP. 63.6% of the patients underwent FESS an average of 1.6 times before starting the biologic, while only one patient required surgery during treatment. Functional FESS was performed in 69% and radical-Draf-3 FESS in 31%. 33% are being treated with mepolizumab, 23% with reslizumab, 19% with benralizumab, 14% are being treated with omalizumab, and 4% with dupilumab. 66% of them required changing biological therapy. The mean time in treatment with biologics was 41.28 months. Two patients presented adverse effects with benralizumab, and only one required to change the biological therapy. The Lund-Mckay classification improved 4 points after therapy. In the NPS score, they represented an improvement of two points after treatment with biologics with a statistically significant result with $p < 0.001$. Regarding the variables collected on the VAS scale, the improvement was 2 points in the case of nasal obstruction, nasal congestion and rhinorrhea, and 3 points in the sensation of facial pressure. The results were statistically significant with a $p < 0.001$ except in the case of smell.

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CRSwNP patients using biologicals: real-world experience in a reference center

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Poster Session | CRS – medical management | 18 June – 22 June, 2023, All day

Background: CRSwNP is predominantly a type 2 inflammatory disease in Western populations. In difficult-to-control patients, anti-type 2 biologicals have been shown to be an effective rescue treatment. However, there are limited data on CRSwNP patients undergoing biologicals outside Europe and the US. **Aim:** To evaluate outcomes in difficult-to-control CRSwNP patients undergoing dupilumab treatment in a reference center. **Methods:** 24 patients from São Paulo, Brazil, unresponsive to conventional treatments who received dupilumab for at least 3 months were evaluated by blood eosinophil counts, Lund–Kennedy (LK) endoscopic score, SNOT-22, and olfactometry. Pre and post-treatment parameters were compared. **Results:** Patients presented a mean age of 49.4 years, 69% had AERD and 23.1% had asthma associated only. Median blood eosinophilia was 600 cells/uL (P25-75= 350-1000) Median time of Dupilumab use was 9 months (P25-75= 5.3-16 months). Dupilumab promoted a significant improvement in SNOT-22 scores ($\Delta=-34.5$, $p<0.0001$), LK score ($\Delta=-4.5$, $p<0.0001$), and olfactory test ($p<0.0001$). Length time of use was associated with better outcomes in LK and olfactory test, but not for SNOT-22. Three patients discontinued the use of dupilumab (despite sinonasal symptoms were controlled) due to adverse events. **Conclusions:** In our center, most of patients experienced a significant improvement in symptoms and objective measures in patients with CRSwNP treated with Dupilumab. Prospective follow-up is necessary to better elucidate long-term efficacy and incidence of side effects.



CRS – outcome assessment

1722

Comparative short-term efficacy of endoscopic sinus surgery and biological therapies in chronic rhinosinusitis with nasal polyps: a network meta-analysis

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Poster Session | CRS – outcome assessment | 18 June – 22 June, 2023, All day

To compare the safety and efficacy between endoscopic sinus surgery and different biologics in treating chronic rhinosinusitis with nasal polyps in adults through reviewing the existing clinical trials. We included randomized controlled trials involving endoscopic sinus surgery (ESS) or biologics in treating adult patients with chronic rhinosinusitis with nasal polyps. Studies involving other miscellaneous diseases, non-RCT design, and insufficient participants or follow-up were excluded. In this systematic review, five RCTs and 1748 patients were included. All the biologics, as well as ESS, could significantly improve key nasal outcomes in CRSwNP. Dupilumab exhibited better efficacy versus ESS in improving SNOT-22 scores even at one year. However, ESS showed its superiority over three biologics in improving nasal congestion scores (NCS) both at 6 months and 1 year, except for better efficacy of Dupilumab at 1 year. For loss of smell scores, a greater improvement was observed in Dupilumab cohort compared with other biologics and even ESS counterparts. Safety analysis showed no significant difference between the ESS cohort and biologics treatment. In summary, ESS showed comparable improvement of quality of life and symptoms to Omalizumab, Mepolizumab, and Benralizumab. Dupilumab seems to be more effective than ESS in selected items, whereas head-to-head trials and real-world studies are urgent to compare their efficacy. Our findings also supported that biologics could be applied as alternative or adjuvant therapy for uncontrolled severe CRSwNP.



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Efficacy of dupilumab in eosinophilic chronic rhinosinusitis associated with eosinophilic otitis media

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Poster Session | CRS – outcome assessment | 18 June – 22 June, 2023, All day

Introduction: Eosinophilic chronic rhinosinusitis (ECRS) is characterized by nasal polyps with eosinophil infiltration and frequently recurs after surgery, and is often associated with bronchial asthma, and sometimes eosinophilic otitis media (EOM). EOM is persistent otitis media with mucinous middle ear effusions, marked eosinophilic inflammation, and a high risk of progressive hearing loss. Recently, the IL-4Ra monoclonal antibody (dupilumab) has been available for the treatment of refractory ECRS, has also been reported to be effective for EOM. In the present study, we investigated the effect of dupilumab on both diseases in ECRS associated with EOM. **Methods:** Subjects were five cases administered with subcutaneous dupilumab for at least one year. Treatment effects were assessed by nasal polyps score, nasal obstruction score in before and after dupilumab administration, steroid medications per 3 months, EOM severity score. **Results:** Nasal polyps score and nasal obstruction score decreased after administration of dupilumab. The frequency of steroid medications and EOM severity scores also decreased. **Conclusions:** The present results indicate that the administration of dupilumab is useful of the treatment for ECRS associated with EOM.



1530

Social factors in the development of chronic rhinosinusitis

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Poster Session | CRS – outcome assessment | 18 June – 22 June, 2023, All day

Introduction: In an era where prevention is paramount, understanding social factors for chronic rhinosinusitis (CRS) may facilitate preventive interventions that mitigate risk factors associated with the initiation or progression of the disease. **Aim and objectives:** In this systematic review, we try to describe and assess the available evidence that links CRS with social factors, such as socioeconomic status and class, educational status, family status, living and working location and conditions, and use of toxins or recreational drugs (smoke, alcohol, or recreational drugs) as well as exercise and diet. **Method:** We assessed the available evidence linking CRS with social factors. We included articles if "sinusitis" or "rhinosinusitis" or "nasal polyps" and either one of the previous terms were mentioned in the title or abstract. We excluded single-case reports or small case series or publications that, following review of the full article, were deemed to not explicitly fulfill our criteria. **Results:** Thirty studies from 1995 onwards fulfilled our inclusion criteria and were used for this review. **Conclusion:** Social deprivation and low socioeconomic level seem to be directly associated with rhinosinusitis, as there are pollutants in living or working environment. A clear and direct association between smoking (both active and passive) and rhinosinusitis was also shown. However, the link between rhinosinusitis and education level, and exercise and diet, if any, seems to be more complex.



CRS – pathophysiology

1723

Decreased production of tissue plasminogen activator in endothelial cells from nasal polyps

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Poster Session | CRS – pathophysiology | 18 June – 22 June, 2023, All day

Background: Previous studies have demonstrated that chronic rhinosinusitis with nasal polyps is characterized by excessive fibrin deposition which is related to impaired production of tissue plasminogen activator by epithelial cells. This study aims to evaluate whether t-PA expression in endothelial cells is also decreased under the inflammatory milieu of CRSwNP. **Methods:** An immunohistochemistry and RT-PCR analysis of polyp tissues from eosinophilic and non-eosinophilic CRSwNPs was conducted. RNA sequencing datasets from chronic rhinosinusitis were retrieved to evaluate endothelial cells expression of t-PA. The expression of CD31 and t-PA was evaluated by RT-PCR and ELISA, nasal endothelial cells were stimulated with or without retinoic acid and IL-13. **Results:** We observed the increased expression of pro-angiogenic genes and vascularity in both eCRSwNP and neCRSwNP. Single-cell RNA sequencing and immunostaining revealed that t-PA expression was decreased in endothelial cells of polyp tissues. In vitro study, IL-13 could significantly attenuate t-PA expression in endothelial cells, which can be rescued by retinoic acid. **Conclusions:** Our findings showed significant contribution of endothelial cells in the production of t-PA in sinonasal tissues. Furthermore, the levels of t-PA in endothelial cells could also be impaired in the inflammatory environment of CRSwNP. Retinoic acid is a promising therapeutic reagent which could restore t-PA expression, thus degrading the deposited fibrin in polyp tissue.

1230

The Influence of Inhibitors of Apoptosis Proteins (IAPs) on Chronic Rhinosinusitis with Nasal Polyps

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Poster Session | CRS – pathophysiology | 18 June – 22 June, 2023, All day

Introduction: Inhibitors of apoptosis proteins (IAPs) could have a role in the CRSwNP or interfere with the susceptibility of NP with topical nasal corticosteroids **Objectives:** To compare the expression of IAPs between patients with CRSwNP and controls, to associate the expression of IAPs with the response to nasal corticosteroids, and to correlate the expression of IAPs to inflammatory markers. **Methods:** We obtained nasal biopsies from patients with CRSwNP (n=27) and controls (n=16). The gene expression of IAPs (XIAP, BIRC2/IAP1 and BIRC3/IAP2) and caspases (CASP3, CASP7, CASP9 and BCL2) were measured by qRT-PCR. The dosages IFN- α , IL-5, IL-33, IL-10, IL-17, and TGF- β were measured by the Luminex. Principal Component Analysis (PCA) was used to correlate the expression of the markers with the response to nasal corticosteroids in the patients. **Results:** We found lower expression of the three IAP genes and significantly higher expression of the cytokines INF- α , IL-5, and TGF- β in patients compared to controls. BIRC2/IAP1 expression was significantly associated with poor response to topical corticosteroids. PCA analysis identified that BIRC2/IAP1, XIAP, BCL2, CASP9, IL-17 and IL-33 were increased in patients with better clinical response, while CASP7 and TGF- β were related to worse response to treatment. **Conclusions:** Our data suggest that the decrease in IAPs expression is significant in the CRSwNP pathophysiology and may predict worse outcome to clinical treatment.

1259

The influence of parenteral vaccination against influenza on the clinical and immunological condition of patients with chronic inflammatory diseases of the upper respiratory tract in the remission phase

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Poster Session | CRS – pathophysiology | 18 June – 22 June, 2023, All day

One of the main sources of exacerbation of chronic inflammatory diseases (CID) of the respiratory tract is respiratory viral infection (RVI), which facilitates bacterial colonization, changes local protective mechanisms in respiratory tract, leads to easier adhesion of bacterial cells, which increases inflammation, leads to increased symptoms diseases. The purpose of the study was to determine the condition of patients with upper respiratory tract infection in dynamics after systemic vaccination against influenza. It was shown that the administration of influenza vaccine to patients with CID, who already had protective immunity against influenza viruses, after 3 weeks led to increase in the frequency of detection of antibodies to viral hemagglutinins in titers higher than the minimum clinically significant level from 59% to 84% with a decrease to 57% 3 months after vaccination. Within 9 months after vaccination, a decrease in the number of episodes of acute RVI in patients was observed to 15.6%. The clinical course of the main disease occurred without characteristic frequent exacerbations. This was accompanied by a stimulating effect of vaccination on a number of non-specific indicators of systemic and local immunity and a decrease in the amount of transient microflora in the oropharyngeal secretions of such patients.

1326

A distinct nasal eicosanoid signature in severe refractory chronic rhinosinusitis with nasal polyps

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Poster Session | CRS – pathophysiology | 18 June – 22 June, 2023, All day

Arachidonic acid derived leukotrienes (LTs) and prostaglandins (PGs), i.e., eicosanoids, are implicated in the disease severity of chronic rhinosinusitis with nasal polyps (CRSwNP). However, their role in refractory CRSwNP is not well understood. We aimed to identify potential endotypes based on nasally secreted eicosanoid levels by cluster analysis. Nasal secretions and NP tissues from 38 patients with CRSwNP, destined for sinus surgery, were collected at surgery and NP recurrence was assessed endoscopically 12-months post-surgery. Levels of PGD₂, PGE₂, LTB₄, LTE₄, and 15(S)-hydroxyeicosatetraenoic acid (15(S)-HETE) were measured with specific immunoassays. Potential heterogenous eicosanoid patterns were explored and compared with clinical characteristics of refractory disease. Clustering identified three patient subgroups (clusters) with clinically relevant differences. Cluster 1 and 3 were characterised by high and low eicosanoid levels, respectively. Cluster 2 featured higher levels of PGD₂ and LTE₄, lower levels of PGE₂ and LTB₄, more cases of recurrent NPs and previous NP removal by surgery. Levels of eicosanoids in NP tissue as well as health-related quality of life will also be discussed in relation to NP recurrence. In conclusion, our findings suggest that endotypes with distinctively different nasal eicosanoid signatures is present in CRSwNP which may be used to identify the most severe and refractory cases prone to recurrent NP growth.

1364

Effect of CHI3L1 on SERPINE1 mediated Fibrinolytic System Imbalance in Chronic Rhinosinusitis with nasal polyp

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Poster Session | CRS – pathophysiology | 18 June – 22 June, 2023, All day

Chronic rhinosinusitis (CRS) is an inflammatory disease of the nose and sinuses affecting over 10% of adults worldwide. CRS is classified into types based on immune response and distribution of immune cells. Th2-based inflammation and eosinophilic dominant CRS are associated with tissue remodeling and impaired fibrinolytic system. Using gene analysis, DEG analysis, KEGG and GO analysis, and sc-RNA-seq data, we found that in nasal polyp tissue, the expression of PAI-1, u-PA, and u-PAR was up-regulated, and the expression of t-PA was down-regulated. Genes related to the fibrinolytic system had a significant positive correlation with the expression of IL-6 and Th2 cytokines. CHI3L1 (YKL-40) was significantly increased in differentiated EOL-1 and induced fibrin deposition by impairing the fibrinolytic system in fibroblast and epithelial cells. Inhibition of CHI3L1 suppressed these alterations, suggesting that regulation of CHI3L1 may be a potential treatment for eosinophilic CRS.

1408

The influence of nasal microbiota on the development of chronic rhinosinusitis

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Poster Session | CRS – pathophysiology | 18 June – 22 June, 2023, All day

Numerous studies assume a harmful influence of bacteria on the development of chronic rhinosinusitis (CRS), but there are conflicting opinions where it is considered that certain microbiota have a protective effect on the mucous membrane against the development of CRS. We have analyzed data from 80 patients, of which 55 were with CRS with nasal polypsis (CRSwNP) and 25 control patients without CRS. Patients with CRSwNP were further divided into two groups; with and without a significant level of eosinophils in the nasal swab. A bacteriological swab of the right maxillary sinus was taken in all patients and analyzed by MALDI TOF. Allergological treatment of patients included nasal swabs for eosinophils and total IgE levels. All patients filled out the SNOT-22 questionnaire. The most frequently isolated bacteria in all three groups of patients was *E. coli* and *Citrobacter* spp., but with no significant difference compared to the number of other isolated bacteria ($p=0.2$). Patients with CRSwNP who do not have a significant level of eosinophils in the smear have a significantly higher score of the SNOT-22 questionnaire ($p=0.01$). There is no difference in the findings of bacteria of patients with CRSwNP and patients without CRS. Further studies should resolve the role of the microbiome in CRS.

**1528****The INHERITED LEVEL of IL-1 β and IL-4 PRODUCTION as the RISK FACTORS of the CHRONIC SINUSITIS in CHILDREN**Svitlana Levytska¹¹*Department of pediatric surgery and otolaryngology, Bukovinian State Medical University, Chernivtsi, Ukraine*

Poster Session | CRS – pathophysiology | 18 June – 22 June, 2023, All day

Introduction The mutations of the interleukins genes may determine the balance between cytokines production and affect the development of chronic inflammatory processes of the paranasal sinuses. **Aim** The evaluation of the association between the single nucleotide polymorphism (SNP) of the IL-1 β gene (C-511T) and the IL-4 gene (C-590T) and chronic rhinosinusitis (CRS) development in children. **Patients and Methods** We examined 100 children with CRS and 35 children of the control group (CG). All children were genotyped for the IL-1 β (C-511T) SNP and the IL-4 (C-590T) SNP by polymerase chain reaction and restriction analysis. **Results** The mutant T-allele of C-511T SNP of IL-1 β gene was associated with increasing of IL-1 β production (71,17 \pm 3,23 pg/ml vs. 62,21 \pm 2,17 pg/ml; $p < 0,05$) as well as the mutant T-allele of C-590T SNP of IL-4 gene was associated with increasing of IL-4 production (65,73 \pm 3,98 pg/ml vs. 46,03 \pm 1,37 pg/ml, $p < 0,05$). Significantly higher frequency of the T-allele of the IL-4 SNP was revealed in CRS-children (43,5% vs. 24,3%, $p < 0,05$). The CC-genotype of the IL-1 β dominated in the CRS-children (46% vs. 22,9%, OR - 2,9 (CI-1,2-6,9)) as well as domination of the CT-genotype (65% vs. 42,9%, OR-2,5(CI-1,1-5,4)) and TT-genotype (11% vs. 2,9%, OR-4,2 (CI-0,5-33,8)) of the IL-4 SNP was revealed in CRS-patients. **Discussion** The T-allele of the IL-1 β (C-511T) SNP can be the protective factor whereas the T-allele of the IL-4 (C-590T) SNP increases the risk of the development of the chronic sinusitis.



1716

Histological Analysis of Respiratory Epithelial Adenomatoid Hamartoma

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Poster Session | CRS – pathophysiology | 19 June – 22 June, 2023, All day

Respiratory epithelial adenomatoid hamartoma (REAH) is a rare benign lesion that was first described in 1995. REAH is a type of hamartoma, which is a developmental malformation that results in the formation of disorganized tissue. Histologically, REAH is characterized by the presence of secretory glands that are lined by respiratory epithelium-derived lineal epithelium, and which extend from the surface epithelium into the subepithelial mucosa. To gain a better understanding of the histological characteristics of REAH, this study employed immunohistochemical staining to investigate the expression of various epithelial markers, including Cytokeratin 5, p63, Cytokeratin 8, α -tubulin, and Mucin 5AC. The distribution of these markers was examined in both epithelial mucosa and subepithelial mucosa in normal tissue, chronic rhinosinusitis, and REAH cases. The findings revealed that certain types of nasal polyps in chronic rhinosinusitis with submucosal glandular hyperplasia have a similar structure to REAH, and that there is also a substantial amount of glandular tissue in normal tissues. Nevertheless, the glandular cells of submucosal tissue are differentiated from those of normal tissue by their positive expression of Mucin 5AC, and from those of nasal polyps in CRS by their positive expression of α -tubulin.



1637

Effect of topical thrombin on visual field quality for functional endoscopic surgery: a double-blind randomized controlled study

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Poster Session | CRS – surgical management | 19 June – 22 June, 2023, All day

Objective: To investigate the effect of topical thrombin application on the improvement of surgical field bleeding and surgical field improvement in functional nasal endoscopic sinus surgery. **Methods:** From January 2021 to October 2021, 60 patients with chronic sinusitis were enrolled in the nasal endoscopic sinus surgery in Hangzhou First People's Hospital. In the intervention group, 30 patients were dissolved in normal saline with thrombin lyophilized powder to rinse the surgical cavity (5000U: 500ml normal saline), and the control group was washed with normal saline. The retrospective surgical videos were reviewed by a third party using blind Boezaart grading to assess blood loss and surgical field quality 15, 30, and 45 minutes after the start of surgery. **Results:** The surgical field quality in the intervention group was better than that in the control group, with the first time ($P = 0.002$) and the second time ($P = 0.003$), but not in the third quarter ($P = 0.163$). In addition, the amount of blood lost in each period was significantly lower in the intervention group than in the control group ($P = 0.001$). **Conclusion:** Topical thrombin can effectively reduce bleeding in FESS patients and improve surgical sinusitis. Based on these findings, topical thrombin lyophilized powder may be a useful method to provide a suitable surgical field for surgery.



1801

Association between smoking and outcomes following functional endoscopic sinus surgery for chronic rhinosinusitis: a systematic review and meta-analysis

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Poster Session | CRS – surgical management | 18 June – 22 June, 2023, All day

Objective: Chronic rhinosinusitis (CRS) is a prevalent inflammatory disease which can be treated with functional endoscopic sinus surgery (FESS). Some clinicians avoid FESS in smokers due to a perception of poorer surgical outcomes. We aim to clarify if first-hand cigarette smoking in CRS is associated with quality of life (QOL), olfactory function, CT and endoscopy scores following FESS. **Methods:** Three reviewers extracted data and evaluated study bias using the Newcastle-Ottawa scale and Cochrane Risk of Bias tool, following PRISMA guidelines and a PROSPERO-registered protocol (CRD42022345585). We used random-effects meta-analyses to determine the association of smoking with QOL in CRS before and after FESS. We also performed descriptive analysis of olfactory function, CT scores and endoscopy scores in both groups before and after FESS. **Results:** We included 2 cross-sectional studies, 4 cohort studies, and 1 prospective clinical trial. Post-FESS QOL was similar among non-smokers and smokers (standardized mean difference = -0.09, 95%CI = -0.52-0.34, N=3, I²=75%). Descriptive analysis showed no significant correlation of smoking with post-FESS olfactory function and endoscopy scores. **Conclusion:** Smoking is not associated with poorer QOL, olfactory function or endoscopy scores after FESS. The evidence does not support excluding patients from FESS on the basis of smoking status alone.



1136

Anterior Nasal Artery - A Key Landmark for Frontal Surgery

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Poster Session | CRS – surgical management | 18 June – 22 June, 2023, All day

The position of the anterior ethmoidal artery (AEA) is also challenging when an approach to the frontal sinus is planned – the AEA with its nasal branch is located at the most posterior extent of dissection, near the first olfactory fibre, with its injury leading to retraction of the vessel behind the orbit ultimately leading to a retro-orbital hematoma. Therefore, a dissection of 20 halves of a dry injected skull was performed in order to understand the location of the anterior nasal artery in relation to lamina cribrosa and first olfactory fibre and also to determine its utility as a landmark to the correct coronal trajectory into the frontal sinus away from the anterior skull base. It was found that in 100% of the specimen, the nasal branch of the AEA is located anterior to the first olfactory fibre, being the first medial and anterior structure in the lamina cribrosa area. The authors consider that the landmarks proposed by the authors are useful when the frontal sinus is approached.



CRS – surgical management

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Difficulties in FESS, and how can be resolved?

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Poster Session | CRS – surgical management | 18 June – 22 June, 2023, All day

Abstract FESS is considered now days as one of common and basic surgical procedures in rhinology. Although it constitutes one of effective, preservative and functional surgeries in rhinology but still it may be associated with some significant technical difficulties that interfere with the proper performance of this procedure. Therefore, this will result in increase the risk of intra-operative complications as well as post-operative residuals and recurrences of different pathologies. For this reason and according to our own experience, we tried through this overview to focus on some of these common difficulties and we tried in same time to describe the most helpful ways to overcome these possible difficulties and find out the best practical solutions for them. **Key words:** FESS difficulties, intra-operative FESS difficulties, technical FESS difficulties



1282

Unexpected foreign body of maxillary sinus

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Poster Session | CRS – surgical management | 18 June – 22 June, 2023, All day

First case: In the first half of 2019, the dentist started treating the patient and implanting the implant in the upper right jaw, but due to the Covid 19 pandemic, the treatment was stopped. After year and a half he visit dentist, and found there is no implant in the upper jaw. An X-ray panoramic orthography was taken and an implant was found outside the bone, completely in the maxillary sinus on the right side. The patient was referred to the ENT, where after the CT of the paranasal sinuses is done, presence of a metal foreign body in the maxillary sinus was confirmed. After adequate preparation, FESS was performed under general anesthesia and we extract dental implant. Second case: The patient was referred to the ENT for examination after CT of the paranasal sinuses due to suspicion of a tumor change in the left maxillary sinus (differential dg Sinusitis chr.). Previously ophthalmologist treated him for the appearance of ectropion on the lower eyelid on the same side. Anamnestic data obtained that more than 10 year ago he had an injury to the floor of the orbit and that he was surgically treated. After adequate preparation, FESS was performed under general anesthesia, and when removing the chronically altered mucosa, a foreign body was removed from the sinus, a material placed during plastic surgery of the orbital floor - neuromesh, although there is a possibility that it is a vascular graft. Coincidence: Sometimes, after some surgical procedures we can expect complication even couple of years after that procedure was done.

1401**Surgical treatment of rhinosinusitis in AERD**Rumen Benchev¹¹*Clinic of Otorhinolaryngology University Hospital Sofia*

Poster Session | CRS – surgical management | 18 June – 22 June, 2023, All day

AERD is characterized with severe eosinophilic inflammation type 2 of the airways, causing asthma and chronic rhinosinusitis with nasal polyposis. Both asthma and rhinosinusitis have severe course which leads to frequent exacerbations of asthma and recurrence of nasal polyposis. The main clinical characteristics of the rhinosinusitis in AERD are massive involvement of the sinuses with nasal polyposis especially the posterior group of paranasal sinuses, thick nasal discharge. The presentation is a short review of the contemporary surgical concepts for treating rhinosinusitis in AERD. The goal of the surgical treatment of the rhinosinusitis is to restore nasal breathing, to reduce the inflammatory load of the eosinophilic infiltration of sinunasal mucosa, to open widely all the sinuses, providing anatomical conditions for further local medical treatment. Because of its great rate of recurrence of nasal polyposis after surgical treatment, the extend of the surgery is very important. The minimally invasive FESS directed only to the most prominent pathology by opening the natural ostia of the sinuses and reestablishing of their ventilation is not efficient in AERD. On the other hand, more radical surgery with stripping of the inflamed mucosa, thus removing the reservoir of eosinophils, leads to less recurrence, but it results scaring and new bone formation. At the present moment wide opening of all the sinuses and removing of all the polyps up to their basement with leaving the underlying mucosa is one of the recommended attitudes to the surgical treatment of the rhinosinusitis in AERD.



1430

COMBINED-APPROACH SURGERY FOR POTT'S PUFFY TUMOR DRAINAGE

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Poster Session | CRS – surgical management | 18 June – 22 June, 2023, All day

Background: Pott's puffy tumor (PPT) is a rare clinical entity characterized by a subperiosteal abscess associated with osteomyelitis of the frontal bone. It usually occurs as a complication of frontal sinusitis or trauma and is mostly seen in young adolescents. **Methods:** Clinical case report of two PPT in adult patients. **Results:** Case 1: 37-year-old male admitted to the emergency room with a history of visual impairment and progressive swelling of the forehead. Case 2: 31-year-old male referred from the HIV outpatient clinic with frontal headaches and recurrent swelling of the forehead over the previous month. PPT was diagnosed by CT scan and MR. Both patients were immediately started on broad-spectrum antibiotics (ceftriaxone in meningeal prophylaxis regimen) and intravenous corticosteroids. Combined-approach surgery was performed to drain the abscess and ensure adequate sinus ventilation (supraciliary/frontal incision with frontal sinusotomy and endonasal endoscopic fronto-ethmoidectomy). In both cases, antibiotics were maintained over a long course of 6 weeks and there was no recurrence on follow-up after one year. **Discussion:** Both cases highlight the importance of proper diagnosis and treatment of PPT for optimal outcomes, namely avoiding potentially life-threatening intracranial complications. Although endoscopic endonasal surgery is the gold standard treatment for complicated rhinosinusitis, classic external approaches may still have a role in difficult-to-reach areas or when osteomyelitis is present.



1549

INVERTED PAPILLOMA FROM DIAGNOSIS TO TREATMENT

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Poster Session | CRS – surgical management | 18 June – 22 June, 2023, All day

Inverted papilloma is a tumor that occurs in adults 5th decade old. It produce a local destruction, high rate of recurrence , and high risk of carcinomatous evolution. The etiology is very little understood, but the early diagnosis is very important. The treatment is a surgical one, but the endoscopic or external approach depending on extension. The seriousness of this pathology lies in its association with carcinoma, which may be diagnosed at the outset or at recurrence during follow-up. We have evaluate the incidence of sino-nasal inverted papilloma at the patients with chronic rhinosinusitis with unilateral intranasal polyps, and the time for the recurrence after the first surgery. We have connected the results with occupational and industrial exposures , with smoking, and other factors. Surgical procedures of sinonasal inverted papilloma are planned . Origin targeted surgery and proper management of the site of attachment are the key to achieve complete surgical resection of sinonasal inverted papilloma. The advantages of endonasal method are small beeding, leaving maxillary sinus and and inferior turbinate. Disadvantages and limits of the method are: not possible to remove the tumor from frontal sinus, difficulty in removing the tumor from prelacrimal sac recess

1622

Efficacy of prophylactic preoperative desmopressin administration during functional endoscopic sinus surgery for chronic rhinosinusitis: a systematic review and metaanalysis of randomized placebo-controlled trials

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Poster Session | CRS – surgical management | 18 June – 22 June, 2023, All day

Objectives: To examine the efficacy of prophylactic desmopressin versus placebo among patients undergoing functional endoscopic sinus surgery (FESS). **Design:** Systematic review and meta-analysis of randomised controlled trials (RCTs). **Setting:** The Cochrane Central Register of Controlled Trials (CENTRAL), PubMed, Embase, Scopus, and Web of Science databases were screened from inception until 18 March 2022. **Participants:** Patients undergoing FESS. **Main outcome measures:** Primary efficacy endpoints comprised intraoperative blood loss, visual clarity, and operation time. Secondary endpoints comprised side effects. The efficacy endpoints were summarised as risk ratio (RR) or mean difference (MD) with 95% confidence interval (CI). **Results:** Five RCTs comprising 380 patients (desmopressin = 191 patients and placebo = 189 patients) were included. Collectively, the included RCTs had an overall low risk of bias. The pooled results showed that the mean intraoperative blood loss (n = 5 RCTs, MD = -37.97 ml, 95% CI [-56.97, -18.96], p < .001), 5-point Boezaart scores (n = 2 RCTs, MD = -.97, 95% CI [-1.21, -.74], p < .001), and 10-point Boezaart scores (n = 2 RCTs, MD = -3.00, 95% CI [-3.61, -2.40], p < .001) were significantly reduced in favour of the desmopressin group compared with the placebo group. Operation time did not significantly differ between both groups (n = 5 RCTs, MD = -3.73 min, 95% CI [-14.65, 7.18], p = .50). No patient in both groups developed symptomatic hyponatremia (n = 3 RCTs, 194 patients) or thromboembolic events (n = 2 RCTs, 150 patients). **Conclusions:** Among patients unde



1694

Odontogenic sinusitis: Report of two representative cases and review of the current literature

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Poster Session | CRS – surgical management | 18 June – 22 June, 2023, All day

Introduction: Odontogenic sinusitis is an inflammatory condition of the maxillary sinus as a result of dental pathology or dento-alveolar procedures, due to the close anatomical proximity between maxillary sinus floor and posterior teeth root apices. Two cases of odontogenic sinusitis, that followed endodontic treatment with consequent oro-antral fistulas, are presented. **Cases' presentation:** Case A, refers to a 56-year-old woman with unilateral maxillary sinus symptoms starting after endodontic treatment of the left permanent maxillary 1st molar. CT scan and panoramic radiograph revealed overextension of root filling material into the maxillary sinus. Case B, concerns a 62-year-old woman with unilateral maxillary sinusitis after endodontic treatment of the right permanent maxillary 1st molar and oro-antral fistula. Dental scan showed maxillary sinus opacification, as well as the presence of foreign body in it. Both patients underwent endoscopic medial maxillary antrostomy, dental extraction of the causative tooth and repair of the oro-antral fistula with local mucosal flaps. **Conclusion:** Unilateral maxillary sinus pathology with nasal obstruction, foul rhinorrhea and a history of a recent dental procedure or poor dentition should raise the suspicion of a potential dental cause of sinusitis. CT is the current gold-standard imaging modality. Treatment may include antibiotics, oral and/or endoscopic surgery through a multidisciplinary team approach.

1194

Challenges and controversies in endoscopic management of cerebrospinal fluid rhinorrhea

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Poster Session | CSF leaks and management | 18 June – 22 June, 2023, All day

Introduction Endoscopic management of cerebrospinal fluid (CSF) rhinorrhea is considered by many as the ideal approach due to its low morbidity and higher closure rate. However, many challenges and controversies are still reported. **Objective** The aim was to discuss the challenges of endonasal repair of CSF leaks and controversies regarding the use of intrathecal fluorescein (ITF) and the number of graft layers. **Materials and methods** This retrospective study included 30 patients who had had endoscopic repair for their CSF rhinorrhea in our institute between July 2015 and June 2017. Fifteen (50%) patients were managed using the two-layer repair without ITF injection (group I), while the remaining were managed using three or more graft layers and ITF (group II). **Results** The study included 30 patients: 17 (57%) women and 13 (43%) men. Their age ranged from 4 to 68 years with mean \pm SD = 38 ± 15.86 years. Eighteen cases presented with spontaneous leaks (nine of them had normal CSF pressure). Four (13.3%) cases had defects in the posterior wall of the frontal sinus while other defects involved the fovea ethmoidalis, lateral lamella, and the cribriform plate of the ethmoid. Success rate was equal in both groups (93%). **Conclusion** Endoscopic management of CSF rhinorrhea has many challenges including repair in the pediatric population and anatomical areas with difficult accessibility, for example, frontal sinus leaks. It requires good endoscopic visualization and endoscopic instrumentation facilities in addition to experienced surgical hands. Double-layer repair and avoidance of ITF show the same success rate as other more time-consuming strategies with life-threatening complications.



1718

CSF LEAK DUE COMBINED FACIAL AND CRANIOCEREBRAL TRAUMATIC INJURIES DUE TO ROAD TRAFFIC ACCIDENTS

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Poster Session | CSF leaks and management | 18 June – 22 June, 2023, All day

Aim of this study is to present cases of CSF leaki due to combined facial and craniocerebral traumatic injuries..10 cases are peresented. Rang of age between 29 and 59 years old.Ct and mri were performed in all cases.Consrevative treatment in 8 cases (80%) and surgical treatment in 2 (20%).Good outcome in 7 cases (70%),moderate outcome in 2 (20%) and poor in 1 (10%).CSF leak remain a serious complication due to severe injuries.Appropriate managmet is required.

**1181**

Dr

Mostafa ElTaher

Poster Session | CSF leaks and management | 18 June – 22 June, 2023, All day

Introduction Endoscopic management of cerebrospinal fluid (CSF) rhinorrhea is considered by many as the ideal approach due to its low morbidity and higher closure rate. However, many challenges and controversies are still reported. **Objective** The aim was to discuss the challenges of endonasal repair of CSF leaks and controversies regarding the use of intrathecal fluorescein (ITF) and the number of graft layers. **Materials and methods** This retrospective study included 30 patients who had had endoscopic repair for their CSF rhinorrhea in our institute between July 2015 and June 2017. Fifteen (50%) patients were managed using the two-layer repair without ITF injection (group I), while the remaining were managed using three or more graft layers and ITF (group II). **Results** The study included 30 patients: 17 (57%) women and 13 (43%) men. Their age ranged from 4 to 68 years with mean \pm SD = 38 ± 15.86 years. Eighteen cases presented with spontaneous leaks (nine of them had normal CSF pressure). Four (13.3%) cases had defects in the posterior wall of the frontal sinus while other defects involved the fovea ethmoidalis, lateral lamella, and the cribriform plate of the ethmoid. Success rate was equal in both groups (93%). **Conclusion** Endoscopic management of CSF rhinorrhea has many challenges including repair in the pediatric population and anatomical areas with difficult accessibility, for example, frontal sinus leaks. It requires good endoscopic visualization and endoscopic instrumentation facilities in addition to experienced surgical hands. Double-layer repair and avoidance of ITF show the same success rate as other more time-consuming strategies with life-threatening complications.



CSF leaks and management

1255

Our experience of using fat tissue for repair of small defects of the skull base in patients with spontaneous CSF leak

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Poster Session | CSF leaks and management | 18 June – 22 June, 2023, All day

Introduction: Spontaneous nasal CSF leak is characterized by the absence of a history of brain trauma or surgery. **Purpose of the study:** To evaluate the effectiveness of the method for reconstruction of a skull base defect in patients with spontaneous CSF leak using fat tissue graft. **Materials and methods:** We have observed 46 patients with CSF leak. The size of the defect varied from 0.3 to 0.5 cm. 20 patients who underwent surgery with fat tissue graft in two layers. The second piece of fat tissue was applied on top of the first layer and was located in the nasal cavity. 26 patients underwent repair of the skull base defect using the standard overlay technique - a mucousal flap with vascular pedicle. **Results:** After 1 months, a patient of group 1 had recurrence of CSF leak, patients of group 2 had a recurrence of CSF leak in 2 patients, after 6 months in 1 patients of group 2 there was a recurrence 2 patients. **Conclusions:** The technique with fat tissue grafts provides a tight closure of the bone defect. The risk of a recurrence CSF leak is significantly reduced in comparison with the plastics with the use of overlay grafts.



1402

Cerebrospinal fluid leak treatment using endoscopic endonasal approach in our department.

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Poster Session | CSF leaks and management | 18 June – 22 June, 2023, All day

Recently, the treatment of cerebrospinal fluid (CSF) rhinorrhea is increasingly performed using endoscopic endonasal approach. To reveal the success rate and factors of CSF leak treatment using endoscopic endonasal approach, we reviewed CSF leakage cases in our department. Subjects were 22 patients who underwent surgical treatment for CSF leak during recent 13 years. They consist of 14 tumor, four surgical injury, two meningocele, one traumatic and one idiopathic case. Since dura mater defects of less than 20 mm in surgical injury, meningocele, traumatic and idiopathic cases were small we applied 'bath-plug' technique with pedicled nasoseptal flap and bone fragments to those cases. Since tumor cases had large dura mater defects of more than 20mm, multiple-layer reconstruction with three or four layers using femoral fascia, bone or cartilage and pedicled nasoseptal flap was used. The success rate was 100% in this study, while previous studies reported that the success rates were about 90%. We conclude that the cases with small dura mater defect can be closed using 'bath-plug' technique with one layer coverage and those with large dura mater defect needs three or four layers with pedicled nasoseptal flap for successful repairment.



1664

Endoscopic Repair of Cerebrospinal fluid Rhinorrhoea: An Institutional Experience

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Poster Session | CSF leaks and management | 18 June – 22 June, 2023, All day

Introduction: Cerebrospinal fluid (CSF) rhinorrhoea has been reported to be spontaneous or secondary to head trauma, surgery, neoplastic invasion, congenital malformations. The aim of this study is to report our experience regarding the etiopathogenesis, treatment modalities and outcomes of patients that presented in our tertiary care centre with CSF rhinorrhoea. **Material and Methods:** A retrospective study was performed for all cases of CSF leak endoscopic repairs carried out in the ENT Department of University Hospital of Larissa, Greece from January 2013 to January 2023. **Results:** A total of seven patients were recruited in the study. The age of patients ranged from 54 to 58 years. Four patients were female and three were male. The most common cause of CSF rhinorrhoea was spontaneous. All patients underwent transnasal endoscopic repair using a multilayer graft. Intrathecal fluorescein was used in every case, while a lumbar drain was placed in only two. CSF rhinorrhoea was resolved in 100%. The patients were followed up for 2 months to 7 years. **Conclusion:** Transnasal endoscopic repair of CSF rhinorrhoea is a safe treatment modality that offers good success rate along with better visualization, less complications, low recurrence rate and high patient satisfaction.



1744

The necessity of laboratory tests in diagnosing CSF rhinorrhea

Ioannis Skoumpas¹, Chrysoula Vardaxi², Alexandros Poutoglidis², Ahmad Alghoj², Spyridon Gougousis²

¹Department of Otorhinolaryngology - Head and Neck Surgery, "G. Papanikolaou" General Hospital, Thessaloniki, Greece, ²Department of Otorhinolaryngology – Head and Neck Surgery, "G. Papanikolaou" General Hospital, Thessaloniki, Greece

Poster Session | CSF leaks and management | 18 June – 22 June, 2023, All day

Introduction: The limited availability of contemporary laboratory tests for confirmation of cerebrospinal fluid (CSF) leak, like beta-2 transferrin and beta-trace protein, is a reality in various regions including our country. The purpose of our study is to evaluate whether diagnosis is possible without biochemical exams. **Methods:** Fourteen consecutive patients were treated in our hospital with clinical suspicion of CSF rhinorrhea. All patients underwent high resolution computed tomography (HRCT) for detection of skull base bony defects. Magnetic resonance cisternography (MRC) was performed in 12 of them. **Results:** The cause of CSF rhinorrhea was traumatic in 11 and spontaneous in 3 patients. MRC identified the presence of CSF leak in all 12 cases. The remaining two were confirmed with HRCT. HRCT depicted the bony dehiscence in 13. The site of origin was the lateral lamella of the ethmoid bone in 10 and the cribriform plate in 4 patients. In 8 of them the fistula was confirmed and repaired surgically, while lumboperitoneal shunt was performed in two of the remaining. **Conclusions:** Combination of clinical suspicion, endoscopic findings, imaging methods and surgical confirmation can lead to safe diagnosis of CSF rhinorrhea. Despite our encouraging results, further investigation is necessary to support this hypothesis.



Epistaxis and HHT

1128

Epistaxis Treatment options. Literature review.

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¹RCSI member, ²University Hospital Larissa, ³Papageorgiou General Hospital Thessaloniki

Poster Session | Epistaxis and HHT | 18 June – 22 June, 2023, All day

Introduction: Epistaxis is acute bleeding from nostrils, nasal cavity or nasopharynx. It is common and usually resolves with or without medical intervention. Methods: Sixty articles of epistaxis treatment options published in the last 20 years were included in this review. Duplicate, irrelevant and inaccessible articles were excluded. Results: Epistaxis can be treated with simple first aid measures, vasoconstrictors or newer drugs like tranexamic acid, with chemical or electrical cauterization and nasal packing with various materials, absorbable or not. For intractable cases, surgical methods can be applied like endoscopic cauterization, ligation or embolization. Conclusions: Epistaxis can be dealt with variously depending on patient's history and symptomatology, as well as experience and available resources of healthcare providers. Newer nasal hemostatic agents in combination with endoscopic methods have advantages over traditional methods.

1210

EPIDEMIOLOGY AND MANAGEMENT OF EPISTAXIS IN THE EMERGENCY DEPARTMENT. THE EXPERIENCE OF ENT DEPARTMENT OF "PAMMAKARISTOS" HOSPITAL.

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¹ENT department of "pammakaristos" hospital, Athens

Poster Session | Epistaxis and HHT | 18 June – 22 June, 2023, All day

Objective: Epistaxis is one of the most common rhinological conditions treated in an emergency department (ER). The aim of this study is to provide and evaluate epidemiological data and management options for epistaxis treated in the emergency department of our hospital. **Material and Methods:** A retrospective study was conducted during the period between December 2021 and January 2022. Patients with epistaxis presented in the ER at that period were included. The distribution by gender, age, season of appearance were analysed. Patients' medical history (medication interfering with haemostasis) was considered and treatment options were evaluated. **Results:** Overall, 106 patients presented with epistaxis in the ER, from which men were 61% and women 39%. The age range of the patients was between 18 and 93 years old and the disease was more common in patients over 60 years old. Epistaxis was treated with chemical cauterization and/or anterior nasal packing with satisfactory results in 97% of patients. In 3% of patients, anterior and posterior nasal packing was performed simultaneously and they were admitted to hospital for further surveillance and treatment. 30(28%) out of 106 patients, were on anticoagulant medication. **Conclusions:** Epistaxis is a common condition of the emergency department, presenting in every age group of adults and affects both genders but is more frequent in men and older patients. The treatment of epistaxis with chemical cauterization and/or anterior nasal packing is effective in the majority of patients (97%).



1226

EPISTAXIS IN CHILDREN - OUR PERSONAL EXPERIENCE

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Poster Session | Epistaxis and HHT | 18 June – 22 June, 2023, All day

Introduction: Epistaxis is common in children. Most epistaxis in children is minor and is easily managed with direct compression of the nasal alae for 5 to 10 minutes. For more significant or recurrent epistaxis other techniques might include vasoconstrictor nose drops, cautery with 75 percent silver nitrate, topical sealants or glue, nasal packing, or balloon catheters. Most children with epistaxis have spontaneous anterior nasal bleeding without airway compromise or hemodynamic instability. Rapid assessment of general appearance, vital signs, airway stability, and mental status are still necessary to identify children who require airway intervention and/or fluid resuscitation. **Materials and methods:** Twenty nine children were recruited, they were with epistaxis (17 had crusting in the nasal vestibule; 12 did not). A microbiology swab was taken from the anterior nasal cavity of each child. **Results:** All groups were equally likely to have a positive culture. *St. aureus* was more common in the epistaxis group ($p=0.007$) and *Str. pneumoniae* ($p=0.005$). There was no difference in the prevalence of *St. aureus* and *Str. pneumoniae* between crust and noncrust groups. Epistaxis patients were much less likely to have isolates of respiratory pathogens or a skin commensal. **Conclusion:** Children with epistaxis are more likely to have nasal colonization with *St. aureus* and *Str. pneumoniae*. Our data would support the hypothesis that these microorganisms causes inflammation and new vessel formation. The management of epistaxis is very important in our rhinology daily practice.



1335

Family screening of Hereditary Hemorrhagic Telangiectasia in Hungary

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Poster Session | Epistaxis and HHT | 18 June – 22 June, 2023, All day

Hereditary hemorrhagic telangiectasia (HHT) is an autosomal dominant multisystemic vascular disease with a prevalence of 1:5,000-1:10,000. Approximately 90 % of HHT cases have heterozygous family-specific mutations in the ENG, ACVRL1 and rarely in the SMAD4 genes. We present our results of systematic genetic and clinical screenings of Hungarian HHT families between 2012 and 2023. Probands were diagnosed with HHT in our HHT Center by otorhinolaryngological and internal physical examinations completed with characteristic telangiectasis sites, a visceral arteriovenous malformation (AVM) screening and ENG / ACVRL1 / SMAD4 / RASA1 / GDF2 Sanger or Next Generation Sequencing Analysis. At-risk individuals underwent physical examination and testing for the family-specific mutation, followed by AVM screening in the case of clinically suspected/definite HHT and/or in mutation carriers. Eighteen ENG, 17 ACVRL1 and 1 SMAD4 mutations were identified in 21, 29 and 1 families, respectively, with 119 individuals (54 probands and 65 affected family members) carrying the family-specific mutation. In 67 family members of HHT1 and HHT2 families the wild-type ENG/ACVRL1 alleles were detected. Three additional probands with definite HHT showed the wild-type alleles in all tested HHT loci. Clinically, pulmonary and hepatic AVMs were significantly more common in HHT1 and HHT2, respectively. Systematic family screening is the most beneficial recruitment method of HHT patients. The significance of genetic testing is the confirmation or exclusion of HHT in young asymptomatic individuals

1347

The influence of atmospheric factors on the incidence of spontaneous epistaxis.

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Poster Session | Epistaxis and HHT | 18 June – 22 June, 2023, All day

Introduction: Epistaxis is one of the most common ENT emergencies. Several reports have indicated a possible correlation between epistaxis incidence and atmospheric parameters' variation. We aimed to determine epistaxis' seasonal variation and draw correlations to monthly, weekly, and daily recordings of atmospheric measurements. Methods & Materials: In this retrospective study, we included patients that presented with epistaxis at the Emergency Department (ED) of a tertiary academic hospital in Western Greece between January 2020 and December 2021. Cases of trauma or bleeding secondary to a known cause were excluded. Hourly recordings of four atmospheric parameters (temperature, humidity, precipitation and wind speed) were utilized. Results: In total, 289 cases of epistaxis were recorded to present in the ED. A statistically significant negative correlation was noted between the cumulative incidence of epistaxis and the mean Relative Humidity (RH) on both a daily and a weekly basis ($r=-0,21$, $p=0,025$, and $r=-0,11$ $p=0,019$, respectively). Significantly lower mean RH values were recorded during weeks with a high incidence of epistaxis cases. No relationship was noted between other atmospheric factors and epistaxis incidence. Conclusion: Mean RH values account for some of the variation observed in spontaneous epistaxis' incidence in the region of Western Greece. No seasonality was noted in spontaneous epistaxis occurrence.



1468

Endoscopic control of a severe bleeding after Le-Fort I fracture through a lateral transmaxillary approach

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Poster Session | Epistaxis and HHT | 18 June – 22 June, 2023, All day

We present a 73-year-old patient with a severe bleeding after reduction and osteosynthesis of a Le-Fort I fracture. 13 days postoperative severe bleeding originated from the vestibular incision from the prior surgery. Haemoglobin concentration initially at the emergency department was 51g/l. After opening the former vestibular incision and removal of granulation tissue the origin of the bleeding was endoscopically identified and controlled. The opening of the sinus was used for an endoscopic (0° scope) approach. We achieved control of the bleeding through clipping of the internal maxillary artery. In addition, seven erythrocyte concentrates were necessary to compensate blood loss. The patient had a speedy recovery with no bleeding after the surgery. Diagnostic angiography followed by endovascular treatment is the approach of choice, although other approaches have shown good results as well. Due to the acute life-threatening blood loss and in compliant patient we have chosen to omit an angiography. This unusual lateral transmaxillary approach to ligate the internal maxillary artery was chosen since this approach allowed endoscopic control through the Le-Fort I fracture. We recommend decision making according to the specific situation as well as availability of an interventional radiologist and/or endoscopically skilled ENT-surgeon.



1758

Young's Procedure for Refractory epistaxis in Hereditary hemorrhagic telangiectasia complicated with Septal perforation

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Poster Session | Epistaxis and HHT | 18 June – 22 June, 2023, All day

Hereditary haemorrhagic telangiectasia (HHT), also known by the eponym Osler-Weber-Rendu syndrome, is an autosomal dominant disorder. 85% of cases are associated with the ENG or ACVRL1 genes[i], and is characterised by the presence of multiple arteriovenous malformations (AVMs). A lack of elastic fibrin fibres cause fragile blood vessels to dilate, giving them a tendency to bleed. The manifestation of these vascular abnormalities is varied and can affect multiple organs, frequently occurring in the nasal mucosa, exposing the patient to a high risk of spontaneous epistaxis. Thus, epistaxis is one of the most common symptoms in patients with HHT, affecting up to 98% of patients, with the risk increasing with age. In managing patients with HHT, controlling recurrent epistaxis is often of primary importance, due to the risk of a potentially fatal massive haemorrhage. We present a case of a 76 year old gentleman who had recurrent, uncontrolled epistaxis, with a background of HHT. Definitive management of his epistaxis was achieved following a Youngs procedure, complicated by a septal perforation. To our knowledge the Youngs procedure has not previously been described in combination with a septal perforation in a patient with recurrent epistaxis secondary to HHT.

Facial Pain

1286

A case of ALK- positive Diffuse large B cell lymphoma occurred on maxillary sinus

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Poster Session | Facial Pain | 18 June – 22 June, 2023, All day

Malignant lymphoma is the most common form of non-squamous cell cancer occurring in the head and neck regions and includes Hodgkin's lymphoma and Hodgkin's lymphoma. Diffuse large B cell lymphoma (DLBCL) is the most common form of non-Hodgkin lymphoma and is a disease that rapidly invade surrounding tissues, and rapidly progress its oncogenic course. The primary part of DLBCL can be any organ, but most of it is known to occur frequently in the digestive system (GI-tract). DLBCL has a variety of subtypes, one of which is the subplastic lymphokinese (ALK)-positive giant B cell lymphoma. ALK-positive hyperbolic B cell lymphoma is reported to account for less than 1% of DLBCLs worldwide and is known as the most aggressive lymphoma. ALK-DLBCL has rich and variable eosinophilic cytoplasm, large circular nuclei, and prominent nucleophilic morphology, and is not expressed in markers such as CD20, CD79a, and CD3, but is characterized by plasma markers such as CD30, CD138, CD38 and EMA. We report a case in which extra-marrow plasma cell lymphoma was suspected on biopsy at first, but was finally diagnosed as ALK-positive sub-positive giant B cell lymphoma through additional examination.



Facial Plastic surgery beyond the nose

1160

Surgical Outcomes and complications after External Approach Septoplasty

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Poster Session | Facial Plastic surgery beyond the nose | 18 June – 22 June, 2023, All day

Background and Objectives This study aims to investigate the indications of external approach septoplasty and improvement in subjective symptoms and objective parameters in patients who underwent external approach septoplasty to correct septal deviation with various types of deformities. **Subjects and Method** Thirty-one patients who underwent external approach septoplasty from October 2014 to January 2019 were classified by direction, location, and degree of nasal septal deviation, septal shape and surgical techniques. Through acoustic rhinometry, the minimum cross-sectional area and nasal volume were measured before and after surgery. To evaluate the improvement in symptoms, the Nasal Obstruction Symptom Evaluation (NOSE) survey and nasal congestion visual analogue scale (VAS) were also measured. **Results** We found significant correlations between: the direction and degree of nasal septal deviation; the location and degree of nasal septal deviation; septal shape and location of the nasal septal deviation; septal shape and surgical techniques; and the degree of nasal septal deviation and presence of spreader grafts. The NOSE scale following external approach septoplasty improved from 14.7 ± 4.4 to 3.1 ± 3.2 ($p < 0.001$), while the VAS score improved from 7.2 ± 2.3 to 1.2 ± 1.4 ($p < 0.001$). Also, acoustic rhinometry showed that the minimum cross-sectional area and nasal volume at the convex side of nasal cavity significantly increased after surgery. **Conclusion** The external approach septoplasty is a surgical technique that is effective not only in improving subjective symptoms, but also in improving objective parameters. External approach septoplasty could be used in case of caudal and/or dorsal nasal septal deviation



Granulomatous diseases of the nose

1289

Sinonasal Cavity Changes in Granulomatosis with Polyangiitis

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Poster Session | Granulomatous diseases of the nose | 18 June – 22 June, 2023, All day

Background: Granulomatosis with polyangiitis (GPA, Wegener's granulomatosis) is a systematic autoimmune disease in which the sinonasal cavity is the most frequently affected site, and initial presentation in many cases. **Methodology/Principal:** We describe two cases of GPA presenting with subacute rhinosinusitis refractory to long-term outpatient treatment. Despite the standard conservative and surgical treatments in both patients, their symptoms aggravated. **Results:** The CT scans of both patients showed bone destruction of the posterior wall of the maxillary sinuses, as well as of lamina papyracea of the ethmoidal bone. The patients underwent FESS which found a thick membranous exudate covering a pale and fragile mucosa, and biopsies were taken with unusually minimal bleeding. The histology reports were inconclusive, showing only inflammation. CT scans found pulmonary nodules in both patients. We placed the diagnosis on the basis of the clinical, histological and CT scans results and initiated treatment with high doses of steroids. **Conclusions:** Even though a majority of GPA cases affect the sinonasal cavity, the overall low incidence of the disease increases the likelihood for a delayed diagnosis. Therefore, physicians must be aware of the possible sinonasal changes on CT scan and the importance of this imaging modality in early diagnosis of GPA.

1504

A case of nasal Extranodal Natural killer/T-cell Lymphoma mimicking granulomatous inflammation of the nose

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Poster Session | Granulomatous diseases of the nose | 18 June – 22 June, 2023, All day

Introduction Nasal type of extranodal natural killer/T-cell lymphoma (ENKL) is responsible for most cases previously known as midline lethal granuloma. It is a rare manifestation of non-Hodgkin lymphoma difficult to treat, resulting in poor outcomes. **Case presentation** A 73-year-old patient presents with nasal obstruction, nasal purulent discharge, and facial pain, suggestive of chronic sinusitis, that has been treated elsewhere for the last 6 months without any improvement. He also suffers from ear fullness. Endoscopy reveals friable-necrotic, erythematous, and granulomatous nasal epithelium and an asymmetric thickening of the right lateral wall of nasopharynx on the area of eustachian tube orifice. Otoscopy shows signs of otitis media with effusion. Head CT shows near complete opacification of the paranasal sinuses and thickening of nasal mucosa that is more pronounced adjacent to the right eustachian tube orifice. The patient underwent right antrostomy, nasopharyngeal biopsy and right tympanostomy tube placement. The histological examination revealed nasal type of ENKL. The patient is treated with chemotherapy. **Conclusion** A high index of suspicion is needed to diagnose nasal type of ENKL. In this case, endoscopic findings were suggestive of granulomatous disease, but surprisingly the histologic examination revealed ENKL. We conclude that ENKL may sometimes mimic endoscopic finding of granulomatosis with polyangiitis.



1560

LOBULAR CAPILLARY HEMANGIOMA

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Poster Session | Granulomatous diseases of the nose | 18 June – 22 June, 2023, All day

Background: The lobular capillary hemangioma (LCH), commonly reported in the literature as "pyogenic granuloma," it is a rapidly growing lesion characterized by a proliferation of capillaries arranged in lobules and separated by a loose connective tissue stroma, often infiltrated by inflammatory cells. The etiopathogenesis of lobular capillary hemangiomas is still obscure. Trauma, hormonal factors (such as puberty, pregnancy, and contraceptive use), underlying microscopic arteriovenous malformations, and local production of angiogenic growth factors have all been advocated as potential etiopathogenetic factors. **Case report:** A 57 year old female has presented to our emergency department with 4 months history of unilateral nasal obstruction and complaint of recurrent epistaxis. The medical history and endoscopic examination were obtained, and CT scan and MRI were performed. The mass was radically resected through an endoscopic approach. **Conclusions:** Unilateral nasal obstruction, facial pain, and epistaxis are the leading symptoms in patients with LCH of the sinonasal tract. The nasal endoscopy, imaging studies and histologic examination are important to establish an accurate diagnosis. Surgery and radical excision is the treatment of choice for LCH to avoid the risk of recurrence.



1677

Granulomatosis with polyangiitis limited to the nose in cocaine addict patient

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Poster Session | Granulomatous diseases of the nose | 18 June – 22 June, 2023, All day

A 49 year old female presented to the ENT clinic for nose bleeding and pain for 8 weeks. She had a history for cocaine consumption. On physical exam there were ulcers in the septum and lateral wall bilaterally seen with a 30º endoscope. There were signs of infection with yellow mucous from various areas of the mucosa. Antibiotic was prescribed orally with nasal and oral corticoids. She had a good evolution, but the next week she sinusitis appeared again. She denied cocaine consumption and autoimmune and vasculitis markers were ordered. There was a marked elevation of the c-ANCA. Internal medicine was consulted to aid in the study, and they concluded that it was a granulomatosis with polyangiitis limited to the nose with no systemic involvement with the aid of biopsies taken to pathology. Surgical pathology concluded always necrosis after 5 biopsies. Methrotexate was given to the patient with marked improvement, but after 4 weeks the clinical scenario returned. It was concluded that she was still consuming cocaine. Patient was advised to go to a drug addiction aid facility. After 1 year clinical signs are better, but she has an absent tip nose and no cartilaginous septum. Nose reconstruction is still being evaluated upon a committee.

Imaging and investigations

1803

Modern approaches to the treatment of chronic polyposis rhinosinusitis.

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Poster Session | Imaging and investigations | 18 June – 22 June, 2023, All day

Relevance. Chronic polyposis rhinosinusitis is a persistent inflammation of the nasal mucosa and paranasal sinuses. Targeted biological therapy is being actively introduced, however, its effectiveness and safety have not been fully studied at the moment. **Purpose of the study.** To evaluate the effectiveness of the use of IL-4 and IL-13 receptor inhibitor in treatment of chronic polyposis rhinosinusitis for 12 months. **Materials and methods.** During 12 months, on the basis of the otorhinolaryngological department 12 patients were treated: 5 women and 7 men aged 30 to 62 years. The average age of patients is 47 years. In the treatment were used subcutaneous injections of 300 mg of the drug once every 2 weeks of an inhibitor of the IL-4 receptor, IL-13 in combination with intranasal glucocorticosteroids. **Research results.** At the initial examination polyps obturated the common nasal passage, the average polyp size score reached 5.66 ± 0.26 . Till 12 month - 0.66 ± 0.94 . Before treatment, the mean score on the SNOT-22 scale was 54.25 ± 4.88 . By the 12th month the quality of life of patients was 8.1 ± 0.45 . The severity of anosmia at the initial examination averaged 9.36 ± 0.24 . By the 9th month of therapy, patients do not complain of anosmia. Before therapy the score of sinus pneumatization according to LMC-CT was 18.9 ± 0.83 . By 12 months of therapy paranasal sinuses were airy. No serious side effects of therapy were observed. **Conclusions.** Biological therapy demonstrates significant efficacy in reducing the symptoms of chronic polyposis rhinosinusitis.

1704

Flexible Nasendoscopy documentation by Junior Doctors in a Tertiary Ear, Nose and Throat (ENT) Emergency GP Referrals Unit (GPRU)

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Poster Session | Imaging and investigations | 18 June – 22 June, 2023, All day

Introduction Flexible nasendoscopy (FNE) is a diagnostic tool used by ENT surgeons to examine the upper aerodigestive tract (UADT) identifying pathology ranging from malignancies to severe infections(1). Currently there are no formalised minimum standards for documentation; literature review yields a short communication by Singh and Lyons in 2004(3). We audited current FNE documentation practice amongst Junior Doctors (JDs) in our GPRU against Singh and Lyons' guideline. Methods Retrospective review of patients who attended GPRU in January 2023. JDs were also surveyed on their confidence identifying normal anatomy, foreign bodies and parapharyngeal swelling. Results: 31 patients underwent FNEs with 52% (N=16) by a JD alone. The main indication was assessment of suspected UADT foreign body (16%, N=5), followed by peritonsillar abscesses (13%, N=4). No patients had all the pertinent anatomy documented, and some were never documented. 13/13 junior doctors reported high confidence levels in identifying FNE findings. Conclusion: Despite high confidence levels of knowledge, our JD's documentation was poor. It is unclear if this is due to poor anatomical knowledge or a lack of insight into the importance of documentation. This highlights the need for formalized standards and ensuring that clinicians are well-trained in identifying and documenting all pertinent FNE anatomy.



Lacrimal Surgery

1253

Our experience in diagnosis of the lacrimal sac tumor

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Poster Session | Lacrimal Surgery | 18 June – 22 June, 2023, All day

Introduction. Lacrimal sac and duct tumors are rare. Only about 775 cases have been reported worldwide in the literature from the 1930's to the present day. Mesenchymal tumors constitute 12-14% of lacrimal sac tumors.

Case presentation. Patient B, 47-year-old male complained about the lacrimal mass and epiphora.

He was treated by an ophthalmologist during the last 6 months, without effect.

On CT tumor confined to the lacrimal sac, the nasolacrimal bony canal was smoothly expanded without erosive changes.

Considering with nonspecific symptoms, we suggested of chronic dacryocystitis.

Dacryocystectomy was performed. A neoplasm of a lobular structure was found and removed from the lacrimal sac during surgery. The patient felt improvement in the postop period.

But according to histopathological research - a spindle-shaped tumor of a high degree of malignancy was detected. An immunohistochemical study was performed - a solitary fibrous tumor, not otherwise specified. There are planning to remove the nasolacrimal sac with surrounding tissue.

Conclusion. During the surgical treatment of chronic dacryocystitis, differential diagnosis with neoplasms should be carried out.



Miscellaneous

1492

Lifestyle Factors Impacting TB Relapse: An East Indian Observational Study

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Poster Session | Miscellaneous | 18 June – 22 June, 2023, All day

Introduction: One of the many elements that can cause a TB relapse that is still unknown is lifestyle. These elements could differ from nation to nation and region to region within a nation. We are attempting to analyse key characteristics within this category for recurrence of TB in an East Indian district in Bihar in order to research important lifestyle factors, diabetes, and HIV in the aetiology of tuberculosis. **Methods:** The trial includes all sputum-positive relapse patients in the Chapra district in Bihar for two quarters beginning in January 2022. Health professionals with training evaluate them using a standardised, previously proven questionnaire about potential lifestyle risks, diabetes, and HIV risk for recurrence. **Results:** 80 cases that met the study's inclusion criteria were included. They belonged to the 20–85 age range. In the relapse instances, men outnumbered women by a ratio of 3.8:2. Most of the patients were in the age range of 41 to 50 pounds. Up to 40% were in the 3+ grade. According to the study's factors, there are 24 people with diabetes (30%), 0 people with HIV, 48 alcoholics, and 56 smokers. Most patients had previously received care with the RNTCP regimen. All were recommended by government physicians. Most have been successfully treated in the past. **Conclusions:** The most significant lifestyle factor that contributes to TB recurrence is smoking.

1587

THICKENED MILK FORMULA TREATMENT OF INFANTS WITH GERD AND EXTRAESOPHAGEAL SYMPTOMS

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Poster Session | Miscellaneous | 18 June – 22 June, 2023, All day

Introduction: Gastroesophageal reflux disease (GERD) occurs with esophageal and extraesophageal symptoms. One of the first steps in the treatment of GERD with extraesophageal manifestations is the introduction of thickened milk formulas to formula-fed infants. **AIM:** To examine the effect of carob-bean gum (CBG) thickened milk formulas on reflux and tolerance indices in infants with gastro-esophageal reflux (GER). **METHODS:** For the period March 1 2017 - April 1 2019 56 infants 0 –6 months of age were examined and treated with thickened milk formula at the Second Paediatric clinic, UMHA "St. Marina". The infants exhibited clinical symptoms of GERD, covering reflux data according to the Orenstein questionnaire. They were followed for one month, within 4 visits. On 49 patients were performed two multichannel intraluminal pH-metry with impedance, i. e. they have completed the examination. **RESULTS:** Extraesophageal GERD symptoms are detected in infants with GERD, diagnosed with pH impedance – apnea with cyanosis, wheezing, reflux laryngitis, recurrent pneumonia, cough attacks, bronchial obstruction, general reflux, reflux ethmoiditis, reflux ethmoides (187 in total). After one month of treatment with thickened milk formula, the symptoms greatly subsided in 44 patients. Without follow-up control pH-metry, it is not possible to be certain that GERD is cured as the pH-metry measurements: Boix Ochoa score, SI, SSI, SAP do not change significantly. Treatment with thickened milk formula reduces postprandial reflux in 69% of the patients. **CONCLUSION:** Infants treated with thickened milk formula improve some of the esophageal and extraesophageal symptoms, leading to improved quality of life for the family.



1228

Host Immunity and Nasal Fungal Colonization

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Poster Session | Miscellaneous | 18 June – 22 June, 2023, All day

Objective: Fungal colonization causes opportunistic infection that may manifest when the host's immune status deteriorates. The purpose of this study was to determine the prevalence of fungal colonization in immunocompromised subjects compared to healthy controls. In addition, we evaluated the efficacy of nasal irrigation for restoring the balance of the nasal microbial community. **Methods:** Forty-one immunocompromised patients and 17 healthy volunteers were enrolled from 2019 to 2021. Nasal lavage was performed, and the lavage fluids (NLFs) were collected for analyses of fungal microbiota, galactomannan test (GM), *Aspergillus* qPCR, and fungal culture. Twenty-eight immunocompromised subjects were willing to receive nasal saline irrigation and to collect nasal lavage after nasal irrigation once daily for one month. **Results:** There was reduced richness and diversity, and an increased proportion of *Aspergillus* spp. in the nasal microbiota of immunocompromised subjects compared to those of controls. *Aspergillus* DNA concentration, the positive rates of GM test and fungal culture of NLFs from immunocompromised subjects were significantly higher than those of controls. After one month of daily nasal irrigation, the richness and diversity of the nasal microbiota of the immunocompromised subjects increased. In addition, the *Aspergillus* DNA concentration decreased. **Conclusion:** Our study demonstrated immune deficiency was associated with the prevalence of nasal *Aspergillus* colonization and dysbiosis. Nasal irrigation is a promising method for restoring balance of fungal microbiota.



1459

Pott puffy tumor due to loss of follow-up

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Poster Session | Miscellaneous | 18 June – 22 June, 2023, All day

A 70-years-old woman is seen in our office with a growing frontal swelling for 2 months associated with nasal congestion and pain. As personal background stand out asthma, chronic rhinosinusitis with nasal polyps and glaucoma. She went into a functional endoscopic sinus surgery 2 years ago but afterwards she lost her medical appointments. Only anterior bilateral ethmoidectomy and maxillary antrostomy was made. In our exploration we can see a fluctuating forehead mass that measures 4x3 cm and nasal polyps which produce blockage of both middle meatus. In CT scan is seen a complete blockage of ethmoid and frontal sinuses and a subperiosteal abscess of the frontal bone and soft tissue swelling of the forehead. After antibiotics, a Draf III procedure was made with external access for reconstruction of the external frontal lamina. The recovery of the patient was excellent and until today there is no recurrence. A Pott puffy tumor describes a frontal edema resulting from osteomyelitis of the frontal bone associated to subperiosteal abscess which its common cause is a complication of a sinonasal infection. Head CT with contrast is important for diagnosis. Management consists in broad-spectrum IV Antibiotics and surgery (minimally invasive endoscopic frontal sinusotomy is preferred).



1522

Endoscopic Transbuccal approach for Excision of Cheek lesion

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Poster Session | Miscellaneous | 18 June – 22 June, 2023, All day

Introduction of Endoscopes have revolutionised ENT surgeries. Endoscopes invariably form the base of the rhinology surgeries. The concept of "minimal invasive surgeries" have led to quicker post operative recovery. The patient satisfaction is higher as these are scarless procedures. This is a technical note where in we describe Transbuccal Endoscopic approach for lesions over the zygoma. The benefits of the procedure being avoiding scar over the face and faster healing.



1675

AIRBORNE PARTICULATE MATTER INDUCES NLRP3 INFLAMMASOME-MEDIATED PYROPTOSIS VIA ACTIVATION OF ROS IN HUMAN AIRWAY EPITHELIAL CELLS

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Poster Session | Miscellaneous | 18 June – 22 June, 2023, All day

Objects: Nowadays Air pollution is known to cause serious respiratory problems, and particulate matter (PM) is an important part of it. Therefore, we would like to find out the effect and mechanism of PM on human respiratory epithelial cells. **Methods:** After treating PM on human bronchial epithelial cells, cell viability was measured using MTT. Also NLRP3, IL-1b, IL-18 was analyzed using western blotting analysis and ROS was measured by DCFDA. **Result:** The cell viability was decreased in proportion to the concentration of PM. NLRP3, IL-1b, and IL-18 increased when the concentration of PM increased. In DCFDA measurement, ROS increased when PM concentration increased. The action of PM was suppressed when antioxidant (NAC) was treated. **Conclusion:** PM causes NLRP3 inflammasome mediated pyroptosis through the activation of ROS in human respiratory epithelial cells.

1756

Establishing a Clinical Nurse Practitioner-led Nasal Fracture Clinic: Our Experience

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Poster Session | Nasal and Facial Trauma | 18 June – 22 June, 2023, All day

Objectives In NHS Greater Glasgow and Clyde, an ENT Clinical Nurse Practitioner-led nasal fracture clinic was established in 2021. The service aims to expedite reviews and treatment of patients with nasal fractures and decrease ENT consultant workload to optimise ENT clinic use. Our main objective is to analyse the outcomes of this clinic to determine its effectiveness. **Methods** Retrospective analysis of all patients reviewed in the Clinical Nurse Practitioner-led nasal fracture clinic since its conception in April 2021 to December 2022. This was achieved through reviewing patient medical records and the ENT Nurse Led Nasal Fracture Virtual Clinic Proforma. The main point of focus were clinic outcomes and common reasons for consultant referral. **Results** A total of 234 patients were reviewed. 95 (41%) patients underwent closed nasal fracture reduction (CNFR). 35 (15%) were discharged having declined treatment. 63 (27%) were discharged with no treatment required. 41 (17.5%) were referred for consultant review. Common reasons for referral included: complex cases, patients with longstanding nasal congestion and patients unhappy with the outcome after CNFR. **Conclusion** A Clinical Nurse Practitioner-led nasal fracture clinic is feasible and appears effective in reducing the number of patients requiring consultant input, thereby optimising clinic use.

Non-allergic rhinitis

1511

Endoscopic endonasal radiosurgery (RFITT) in Eustachian tube dysfunction due to chronic catarrhal and vasomotor rhinitis

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Poster Session | Non-allergic rhinitis | 18 June – 22 June, 2023, All day

Endonasal deformations, chronic inflammatory and allergic processes of the nasal mucosa, accompanied by hypertrophic changes are the main cause of the development of chronic Eustachian tube dysfunction (ETD). Of particular interest in the etiology of ETD are the chronic catarrhal and vasomotor rhinitis. Objective: the aim of the present work is to show the existence of an effective etiological relationship between chronic catarrhal and vasomotor rhinitis and ETD, and also to analyze the results of the use of endoscopic endonasal radiofrequency thermotherapy (RFITT) in the treatment of this pathology. Material: for a period of 5 years, with the help of video-assisted optics and RFITT technique, 52 patients suffering from chronic catarrhal and vasomotor rhinitis with ETD were operated. Method: with video-assisted endoscopic endonasal optics and RFITT technique, were performed a peripheral selective uninasal parasympathetic denervation (PSEPD) and submucosal radiodestruction of the posterior poles of the lower and middle turbinates and the peritubar complex. Results: after PSEPD, endonasal and epipharyngeal radiodestruction, was observed an improvement of complaints from the nasal symptom complex (restoration of nasal breathing and copying of nasal discomfort) and almost complete disappearance of symptoms from ETD (hearing loss, crackling, deafness, vertigo) in 90% of patients. Conclusions: the extremely good postoperative results of the endoscopic RF Surgery for ETD due to chronic catarrhal and vasomotor rhinitis make these surgical method of treatment reliable and promising.



Nasal and facial trauma

1678

How common is Rhinitis Medicamentosa in an ENT outpatient Clinic?

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Poster Session | Non-allergic rhinitis | 18 June – 22 June, 2023, All day

Maria Korodima¹, Georgios Grivas², Aikaterini Drylli³. 1 Resident, ENT Department of "Pammakaristos" hospital, Athens. 2 Consultant, ENT Department of "Pammakaristos" hospital, Athens. 3 Consultant, ENT Department, Health center of Athens. Abstract Rhinitis medicamentosa (RM) is a form of non-allergic irritation and inflammation of the nasal mucosa. It is usually induced by the prolonged use of intranasal decongestants for more than 5 days straight. In the ENT outpatient clinic, 56 patients presented by persistent nasal obstruction from 01/05/2022 to 31/10/2022. Five women and two men were diagnosed with RM (12.5%). Five patients were adults aged from 31 to 68 years old. In contrast, 28.6% were up to 15 years old. The vast majority (71.4%) had a pale and edematous nasal mucosa as well as a positive history of continued use of topical decongestants for a period between two weeks to three years. Subjects who used intranasal sympathomimetic amines (20%) had chronic sinusitis and nasal polyposis while patients with allergic or viral rhinitis applied imidazolines (80%). Furthermore, in two patients the nasal examination revealed an atrophic and crusted mucosa following oral systematic use of contraceptives by a young woman and beta-blockers antihypertensives by a middle-aged man. All patients received intranasal treatment by saline rinses and steroids as well as the cessation of medication that cause RM. The early diagnosis of RM is vital for the interruption of the medication that caused the nasal blockage.



Orbital surgery

1223

A case of nontraumatic subperiosteal orbital hematoma secondary to frontal sinus mucocele

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Poster Session | Orbital surgery | 18 June – 22 June, 2023, All day

Background: Nontraumatic subperiosteal orbital hematoma (NTSOH) secondary to paranasal sinus mucocele was rarely reported. **Methods:** Herein, we report a case of 40-year-old man presented to our hospital for acute proptosis, periorbital pain, diplopia and hypopsia of the right eye. Computed tomography (CT) and magnetic resonance imaging (MRI) were performed for diagnosis. External approach into frontal sinus accompanied endoscopic sinus surgery (ESS) was performed for treatment. **Results:** CT and MRI showed a mass in the superior area of right orbit and a mass in the right frontal sinus. NTSOH of right orbit and mucocele in frontal sinus were definitely diagnosed and completely removed via ESS and external approach into frontal sinus. No recurrence of hemorrhage occurred during follow-up. **Conclusion:** NTSOH should be suspected when orbital mass presented with sinus mucocele. Surgical investigation is vital for diagnosis and treatment of NTSOH secondary to sinus mucocele.

**1231****Perspicuous Treatment Algorithm for Pediatric Orbital Blowout Fractures****Kosuke Takabayashi¹**, Yohei Maeda¹¹*Department of Otorhinolaryngology*

Poster Session | Orbital surgery | 18 June – 22 June, 2023, All day

Aim: Pediatric orbital blowout fractures occasionally include cases that require urgent treatment to prevent serious sequelae. Sometimes physicians cannot confirm findings because pediatric patients may not be cooperative with examinations. Hence, we advocate for a simple, practical treatment algorithm for pediatric orbital blowout fractures. **Methods:** This retrospective cohort study included patients with pediatric orbital blowout fractures treated at Japanese Red Cross Asahikawa Hospital from April 2000 to August 2020 based on the algorithm. At follow-up, ocular movements were evaluated based on percentage of Hess area ratio (HAR%) and subjective diplopia. Patients were divided into two age groups: 0–12 years and 13–18 years. Differences in the frequency of urgent cases and HAR% were compared across groups. **Results:** There were 9 patients who underwent urgent release, 16 who underwent repair, and 36 who underwent conservative treatment. Mean age was 13.10 ± 3.72 years. HAR% on follow-up was $98.0\% \pm 4.7\%$ (range, 77.6%–100%). Postoperative diplopia was observed in 4% of patients. More patients aged 0–12 years had urgent needs than those aged 13–18 years ($p=0.0051$). There were no differences in HAR% between the groups. **Conclusion:** The algorithm is suitable for pediatric orbital blowout fractures.



1502

Orbital Pseudotumor. Report of two cases

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Poster Session | Orbital surgery | 18 June – 22 June, 2023, All day

Introduction Orbital pseudotumor is a benign process affecting the orbit and sometimes the surrounding structures. Its pathogenesis has not been elucidated yet, but some evidence points out to autoimmune, infectious and aberrant healing processes. **Case presentation** We present two cases of orbital pseudotumor. Both cases presented with unilateral orbital pain, blepharoptosis and proptosis. The first patient had a one-month history of unilateral edema/erythema of the upper eyelid and purulent conjunctival discharge. The second patient had a history of recurrent rhinosinusitis for which he had endoscopic surgery thirty years ago. Imaging studies revealed a contrast enhanced mass, compressing the lateral rectus muscle and lacrimal gland in the first case, whereas in the second case there was compression of the superior rectus muscle, ipsilateral frontal sinus empyema and a bony defect of the floor of the frontal sinus. Both patients underwent biopsy of the orbital mass combined with Draf II procedure, in the patient with the frontal empyema. The histological examination revealed inflammatory tissue, characteristic of orbital pseudotumor. The patients were put on therapeutic treatment with high-dose corticosteroids. **Conclusion** Orbital pseudotumors may sometimes be related with sinonasal inflammatory processes. High index of suspicion, careful history-taking and multi-disciplinary approach are mandatory for optimal decision-making and management.



1552

Atypical process of orbital complication in acute rhinosinusitis

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Poster Session | Orbital surgery | 18 June – 22 June, 2023, All day

Infection of the soft tissue of the orbit as an extension of acute bacterial rhinosinusitis (ABRS) is serious complication, with high risk of visual loss or progression into intracranial spreading making it life threatening condition. Despite being relatively rare thanks to adequate antibiotic treatment, orbital cellulitis still accounts of almost 80% of all complications associated with ABRS. Our case describes unusual process of orbital cellulitis in 31 years old man with ABRS complicated by formation of abscesses in the submucosal space of nasal septum, medial and lateral part of the orbit. Patient underwent CT scan and the examination by ophthalmologist and was immediately hospitalized and operated on the same day. Several control imaging methods (including MRI) were performed after the operation revealing formation of another abscess laterally from the bulb requiring combination of endoscopic and external approach. Patient condition in the upcoming period was gradually improving leaving him without any visual impairment. Management of orbital complications due to ABRS highly depends on the fast and proper diagnosis, based on the endoscopic examination and findings on the imaging methods following aggressive treatment with antibiotics and, when indicated, early surgical procedure. Adequate follow-up is an important part of the management.



1595

Orbital apex syndrome in difficult-to-treat Pseudomonas Aureginosa sinusitis

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Poster Session | Orbital surgery | 18 June – 22 June, 2023, All day

Orbital apex syndrome (OAS) involves optic neuropathy and ophthalmoplegia secondary to a variety of conditions. We present an 80-year-old male diagnosed with diabetes mellitus who was admitted in the emergency department for presenting rapidly progressive right eye amaurosis, proptosis and VI palsy. Angio-CT showed intraconal cellulitis with oedema of orbital apex, opacification of ethmoidal cells, bone-dehiscence of optic nerve in an Onodi cell, and normal cavernous sinus. OAS was diagnosed. Treatment with corticosteroids and antibiotics were initiated, and emergency ethmoidectomy and optic nerve decompression were performed. Cultures were positive for pseudomonas aeruginosa. Patient showed initial good clinical progress but recurrent hyperglycemias. A week after finishing antibiotic therapy symptoms worsened, and a new culture showed persistence of quinolone-resistant pseudomonas. Strict glucose-level control and targeted antibiotics were necessary for 6 weeks more. During follow-up, patient slowly recovered eye-movement and visual-acuity. Treatment of OAS is directed at the underlying cause. Anti-inflammatory drugs as corticosteroids may be useful if an inflammatory etiology is suspected. Targeted long-term antibiotics are mandatory in drug-resistant bacterial infections. Although it is more frequently used in traumatic OAS, surgical decompression is helpful in inflammatory conditions with visual loss.



1687

**Purely Transorbital Endoscopic Resection Of Gastrointestinal Stromal Tumor
Metastasis Extending From Temporal Fossa To The Masticator Space**

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Poster Session | Orbital surgery | 18 June – 22 June, 2023, All day

Introduction: Gastrointestinal stromal tumors (GISTs) are the most common malignant subepithelial lesions (SELs) of the gastrointestinal tract in the daily clinical setting. To the best of our knowledge, this is the first case purely transorbital endoscopic (TEA) removal of a GIST metastasis from orbit and masticator space. **Case:** A 58-year-old woman presented with a history of right eyelid swelling and orbital pain. She had a history of a prior stomach gastrointestinal stromal tumor (GIST) with a large metastasis to the frontotemporal lobe; brain tumor removed but intraorbital and masticator part was left untouched. On examination eye motility restrictions to lateral and superior with no relative afferent pupillary reflex and 4 mm of right-side proptosis were detected. On CT and MRI there is a heterogeneous contrasting solid mass lesion in size of 55x40 mm in the temporal bone squamous part on the right sphenoid greater wing, which reaches the masticator space, destroys the pterygoid plates that cause pressure from the posterolateral to the orbit and proptosis. The squamous portion of the right temporal bone and the right orbital lateral wall are destroyed. Total tumor resection were achieved with purely TEA. Patient discharged 1 day after surgery. In postoperative 6 months eye movements are completely normal no sign of recurrence were detected by oncological follow ups. **Conclusion:** In suitable cases transorbital approaches can be use to remove tumors extending from skull base to masticator space in minimally invasive way.

Paediatric rhinology

1272

NASAL SEPTAL ABSCESS COMPLICATING ACUTE SPHENO-ETHMOIDITIS IN A CHILD

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Poster Session | Paediatric rhinology | 18 June – 22 June, 2023, All day

Introduction: Nasal septal abscess is rare, but more common in children as a result of post-traumatic as a result of post-traumatic causes from hematoma septal hematoma infection (75-85), immunosuppression, dental infections, acute sinusitis and recurrent polychondritis. Nasal and ocular complications are the most common complications of septal abscess, while intracranial complications are rarer but fatal. **Purpose:** Presentation of a case of nasal septum abscess in a 15-year-old girl with acute sphenothmoiditis. **Case presentation:** A 15-year-old girl presented with frontal and parietal headache since one week, severe nasal congestion and fever since three days. From the anterior rhinoscopy of the nose, bilateral edema of the mucous membrane of the nasal septum, red in color, easy to press, pasty with obstruction of the nasal cavities is found. Abundant retronasal discharge is seen from the oropharynx. Individual history negative for injury, allergies, immunosuppression, dental pain, bleeding disposition, other past chondritis, and autoimmune diseases. A puncture is performed with aspiration of serous fluid without the presence of $\beta 2$ transferrin. An urgent visceral skull CT is performed without fracture image, bony deficit of anterior skull base with almost complete occupation of ethmoid cells and sphenoid sinus and fluid collection in osseous and cartilaginous part of nasal septum. He is placed on intravenous treatment with ceftazidime 3gr/day and clindamycin 2.4gr/day. **Results:** Surgery is performed with a Killian incision, cleaning and packing for 72 hours in order to drain the nasal septum abscess. Culture of material revealed Strept. Intermedius sensitive to administered antibiotics. On the 6th day, the child is discharged with complete remission of symptoms. Re-examined at 7, 14, 30, 60 days with endoscopy without signs of recurrence. **Conclusion:** In a child with worsening nasal congestion and rhinosinusitis with bilateral swelling of the mucous membrane of the nasal septum, urgent CT scan of the visceral skull, immediate surgical drainage with initiation of intravenous antibiotic treatment and regular follow-up for at least two years are necessary. The aim is to prevent complications and speedy recovery.



1225

Pediatric Chronic Rhinosinusitis – from Diagnosis to Management

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Poster Session | Paediatric rhinology | 18 June – 22 June, 2023, All day

The nose contains organ of smell and respiration. It warms, cleans and humidifies the inspired air, cools and remove the water from the expired air. The ENT surgeon should distinguish normal nasal function from pathological symptoms to prevent unnecessary surgery. Although the nose is a paired structure divided coronally into two chambers, it act as a functional unit. Development of the Maxillary sinus seen on plain films at 4-5 months and slow expansion until 18 years. The Ethmoid sinus seen on radiographs at 1 year and enlarges to reach adult size at age 12. The Sphenoid sinus pneumatization begins at age 3 rapid growth to reach sella by age 7 and adult size at age 18. The Frontal sinus seen on radiographs at age 5-6 and grows slowly to adult size by adolescence. The predisposing factors of the pediatric rhinosinusitis are: Allergic rhinitis; Immunodeficiency: IgG subclasses, IgA; Genetic/congenital; Cystic fibrosis, Ciliary dyskinesia; Anatomic obstruction, Gastroesophageal reflux; Microorganisms; Pollutants, Medications, etc. by Clinical Consensus Statement on PCRS (AAO-HNSF): 20 consecutive days of Antibiotic Management may produce a better response than 10 days therapy. The daily nasal saline irrigations and intranasal steroid use with or without AB are useful. When the reason for pediatric chronic rhinosinusitis (PCRS) is adenoid hypertrophy, then adenoidectomy has been shown to decrease the load of nasopharyngeal pathogens associated with PCRS. Adenoidectomy is an appropriate surgical intervention in children from 6 to 12 ye

1409

Surgical treatment of bilateral choanal atresia with diode laser in premature – case report

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Poster Session | Paediatric rhinology | 18 June – 22 June, 2023, All day

Bilateral choanal atresia appears immediately after birth as respiratory distress, cyanosis, intermittent apnea. The incidence of this malformation is between 1:5000 and 1:8000 livebirths. It is more often unilateral than bilateral (60% vs. 40%) and occurs more frequently in females than in males (ratio 2:1). We represent a male prematurity, body weight only 1571 grams, born in the 34th week of pregnancy. Primarily resuscitated, intubated immediately after birth because of respiratory insufficiency. We performed trans-nasal fiber endoscopy, followed by computed tomography confirming the diagnosis of bilateral bone choanal atresia. Fifth day of birth, under general anesthesia nose airway was recanalized by trans-nasal endoscopic approach with diode laser. After bone perforation, we placed catheters number 6 through choana. During postoperative follow-up, secretion was aspirated every day, and catheters mobilized to prevent granulation and stenosis. Two weeks later, catheters were removed. The child was extubated, breathing independently through the nose with optimal peripheral oxygenation. Bilateral bone choanal atresia can be successfully treated with delayed surgery along prompt prenatal diagnosis and endotracheal airway restoration intubation. Diode laser is one of the therapeutic options. It can effectively remove mechanical barrier to establish physiological respiration.



1418

NASAL RESPIRATORY OBSTRUCTION IN A NEONATE WITH CHOANAL ATRESIA AND STENOSIS OF THE PYRIFORM APERTURE IN THE CONTEXT OF CROUZON SYNDROME

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Poster Session | Paediatric rhinology | 18 June – 22 June, 2023, All day

INTRODUCTION: Nasal airway obstruction can be life threatening to newborns because they are obligate nasal breathers. Some of the causes are choanal atresia (CA) and pyriform aperture stenosis (PAS). Clinically they present as breathing distress, desaturation and cyanosis, reverted by crying. The diagnosis is with computed tomography (CT) and nasal endoscopy. CA is the congenital obliteration or narrowing of the posterior nasal choana. PAS is a congenital narrowing during to mandibular bone growth, is defined as <1 mm of the piriform aperture. **MATERIALS AND METHOD** Term newborn with prenatal history of polyhydramnios, cyanosis reverted by crying, hypertelorism, proptosis, and ogival palate. Catheter can't be passed through both nostrils. CT confirmed the nostrils occupation and choana narrowing, the pyriform orifice was 6mm. With these findings we decided surgical intervention in two stages. Actually the patient is extubated, with oral feeding. **DISCUSSION** Nasal airway obstruction can be life threatening to newborn. The causes are inflammatory or infectious processes, and congenital causes as CA and PAS. The definitive treatment of CA is surgical, with endoscopic approach. The treatment of PAS begins with corticosteroids, indicating surgery if the symptoms persist or worsen after four weeks of treatment.



1517

HEMINASAL AGENESIS, EXPERIENCE FROM THE 30th WEEK OF GESTATION

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Poster Session | Paediatric rhinology | 18 June – 22 June, 2023, All day

INTRODUCTION: Heminasal agenesis (HA) is extremely rare. It consists of the absence of half of the nose (ala, nostril, columella, choanae and nasal bone) with persistent nasal septum. **CASE REPORT:** A 45-year-old woman was referred to our hospital after a foetal doppler ultrasound (US) diagnosis of duodenal atresia and left HA. It was confirmed by prenatal MRI performed at 32nd week of gestation. Immediately after birth, duodenal atresia was successfully addressed with surgery. Nasal endoscopy and CT evidenced a normal right heminasal cavity. On the left side, there was no epiphora and a para-columellar orifice seemed to drain mucus. To date (1- year follow up) management is multidisciplinary and nasal surgery has not been needed. **DISCUSSION:** Prenatal diagnosis of HA is possible by means of US and MRI. Related life- threatening malformations should be ruled out. HA functional aspects (permeability, mucus drainage, nasolacrimal patency, visual accuracy, olfaction or feeding) may be addressed early. Although there is no consensus, aesthetic aspects seem to be optimally addressed during adolescence. **CONCLUSIONS:** HA is extremely rare and case reports are needed to optimize diagnostics and the management of functional and aesthetic aspects.



Pituitary Surgery

1304

Changes in olfaction after transnasal endoscopic pituitary surgery

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Poster Session | Pituitary Surgery | 18 June – 22 June, 2023, All day

Introduction Transnasal endoscopic transsphenoidal approach is the gold standard in the treatment of pituitary adenomas. Nasal function can be deteriorated by surgical procedure. The aim of the study was to determinate the effect of surgical procedure on olfaction and other nasal functions. **Methods** Adult patients diagnosed with a pituitary adenoma and scheduled for transnasal endoscopic resection, underwent preoperative olfactory evaluation using an odorized markers test. Postoperative testing was performed four months after surgery. Patients also assessed their smell and nasal obstruction using visual analog scale prior and 4 months after surgery. **Results** Total of 82 patients (42 females, 40 males) were enrolled into study between 2010 and 2020. Anosmia was detected preoperatively in eleven patients. Olfactory deterioration was observed in 2/71 patients (2.8%). Subjective deterioration of smell was observed in 9/82 (10.9%) patients and subjective deterioration of nasal patency after surgery was observed in 3/82 (3.6%) patients. **Conclusion** Transnasal endoscopic pituitary surgery may be associated with a very low risk of postoperative deterioration of olfaction and other nasal functions. Olfactory testing should be part of the preoperative and postoperative examination and patients should be informed of the possible occurrence of olfactory impairment.

1663

SELLAR CHOLESTEROL GRANULOMA

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Poster Session | Pituitary Surgery | 18 June – 22 June, 2023, All day

INTRODUCTIONSellar xanthogranulomas are intrasellar-suprasellar cholesterol granulomas. This entity has been suggested clinically and pathologically different from adamantinomatous craniopharyngiomas. They are mostly diagnosed in adolescents and young adults. **MATERIAL AND METHODS** 14-year-old patient followed up by endocrinology for short stature and visual defect. MRI revealed a sellar and suprasellar lesion consistent with a craniopharyngioma. Surgery was performed. A transsphenoidal endonasal approach was performed. The solid nodule located in the sphenoid sinus was resected. The floor of the sella was opened and the sellar and suprasellar cystic components were removed. The cyst was marsupialized to the nostrils, maintaining the capsule due to adhesions to both carotid arteries. No cerebrospinal fluid leak was identified. Closure with nasal flaps was not performed. **RESULTS** The anatomopathological result of the specimen was sellar xanthogranuloma. The patient presents permanent visual deficit and hypopituitarism. In control MRI, the lesion has grown again. The marsupialized cavity to the nostrils was closed spontaneously 6 years after the first intervention, so a new intervention is pending. **CONCLUSION** Cholesterol granuloma of the sellar region is a rare tumor, little known about its etiology and evolution. It should be included in the differential diagnosis of other lesions of the sella. More studies are required to understand the natural history of these lesions and therefore allow optimize the management of these patients.

Rhinology – miscellaneous

1178

Influenza viral infection is a risk factor for severe illness in COVID-19 patients: a nationwide population-based cohort study

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Poster Session | Rhinology - miscellaneous | 18 June – 22 June, 2023, All day

In order to prepare for the twindemic of influenza and SARS-CoV-2 infection, we investigated the association between influenza infection and subsequent severity of SARS-CoV-2 infection. A population-based nationwide cohort study was performed using data from the National Health Insurance Service (NHIS) in the Republic of Korea. This study included 274,126 individuals who underwent SARS-CoV-2 PCR testing between 20 January 2020 and 1 October 2020. Among these patients, 28,338 tested positive for SARS-CoV-2, and 4,003 of these individuals had a history of influenza. The control group was selected through 1:1 propensity score matching. In the group of 4,003 COVID-19-positive individuals with no history of influenza, 192 (4.8%) experienced severe illness from COVID-19 infection. In the group of 4,003 COVID-19-positive individuals with a history of influenza, 260 (6.5%) had severe illness from COVID-19, and the overall adjusted odds ratio (aOR) was 1.29 (95% confidence interval 1.04–1.59). Among the 4,003 COVID-19-positive individuals with a history of influenza, severe COVID-19 infection was experienced by 143 of 1,760 (8.1%) with an influenza history within 1 year before the onset of COVID-19, 48 of 1,129 (4.3%) between 1 and 2 years, and 69 of 1,114 (6.2%) between 2 and 3 years before COVID-19 onset, and the aORs were 1.54 (1.20-1.98), 1.19 (0.84-1.70), and 1.00 (0.73-1.37), respectively. In conclusion, individuals who had an influenza infection less than 1 year before COVID-19 infection were at an increased risk of experiencing severe illness from the SARS-CoV-2 infection. T

1254

Increased incidence of rhino-orbital mucormycosis in patients after COVID-19

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Poster Session | Rhinology - miscellaneous | 18 June – 22 June, 2023, All day

Introduction. Mucormycosis is a multisystem, aggressive and opportunistic fungal infection. The most common type is rhino-orbito-cerebral mucormycosis, which accounts for about 40% of all cases. There are no patients with rhino-orbital-cerebral mucormycosis were observed on the territory of Ukraine. Therefore, this disease was considered characteristic of the spread in countries with a tropical and subtropical climate. **Materials and methods.** During 2020-2022 5 patients presented with signs of an aggressive fungal infection to our institution. **Results.** 5 patients had acute rhinosinusitis symptoms of varying degrees of severity and it began to be observed after the experienced COVID-infection. After a few weeks, osteomyelitis of the skull bones varying extent appeared. Slow-flowing phlegmon of the orbit and a fistula in the inner corner of the eye began in 3 patients. In 2 patients was observed the destruction of endonasal structures. 1 patient suffered from ptosis, amaurosis and thrombosis of both cavernous sinuses. From anamnestic data: 4 out of 5 patients had diabetes of varying degrees of severity. 1 patient was HIV-infected and had hepatitis C. All patients noted facial numbness at the beginning of the disease. 3 patients underwent surgery and mucormycosis was detected. Patients were prescribed treatment with amphotericin B. **Conclusions.** The spread of invasive fungal infections has expanded.

1274**Presentation of a patient with a left nasolabial cyst treated with transnasal endoscopic marsupialization**

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Poster Session | Rhinology - miscellaneous | 18 June – 22 June, 2023, All day

Nasolabial cysts are rare soft tissue non-odontogenic developmental cysts. More commonly they affect females typically on the fourth and fifth decades and in 90% of the cases they are localized unilaterally. Diagnosis usually depends on clinical evaluation, but also imaging techniques may be helpful. Nasolabial cysts do not present any finding on plain radiographs. Computed Tomography and Magnetic Resonance Imaging can reveal the extent and relation of lesion to surrounding structures. Sublabial excision and endoscopic marsupialization are the alternative treatment options. We present the case of a 60-year-old woman with no significant medical history that presented to our department with a painless swelling of the left nasal vestibule and symptoms of slight nasal blockage during the last 6 months. Clinical examination revealed a painless mass which caused obliteration of the left nasolabial sulcus, nasal vestibule, and maxillary labial sulcus and which was soft on palpation with no signs of inflammation. Nasal endoscopy revealed protrusion of the mass inside the nasal cavity. CT scan showed the presence of a cyst with no bone erosion. We performed a transnasal endoscopic marsupialization under general anesthesia.



1481

External approach of the frontal sinus: when is it still useful?

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Poster Session | Rhinology - miscellaneous | 18 June – 22 June, 2023, All day

Introduction: Over the years, multiple frontal sinus surgical options have been described, but the main challenge is selecting the most convenient approach based on the patient's anatomy and disease. Despite the impressive advances in endoscopic endonasal approaches and instrumentations there are still cases when the frontal sinus must be approached externally, alone or in combination with endoscopic sinus surgery. **Case report:** We aim to present 4 particular cases with different frontal pathologies (osteoma, chronic rhinosinusitis, mucocele, and Pott's puffy tumor) where the open approach with or without combination with endoscopic surgery was successful. We use different surgical techniques, namely frontal sinus trephination, frontal osteoplastic flap with obliteration of the frontal sinuses, frontal osteoplastic flap with cranialization of the frontal sinus, and frontal osteoplastic flap in combination with endoscopic surgery. **Conclusion:** The frontal sinus remains a challenging area. The appropriate selection of cases appears to be of outstanding importance to obtaining successful outcomes. Because not all patients can be treated only endoscopically, we should consider an external approach in selected patients.



1518

Quality of life after septoplasty in patients with nasal obstruction

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Poster Session | Rhinology - miscellaneous | 18 June – 22 June, 2023, All day

Introduction: This paper aims to present the evaluation of the quality of life in adult patients with nasal obstruction after septoplasty, and the effectiveness of this type of surgery. Nasal obstruction is one of the most frequent symptoms reported to ENT which may have a significant impact on the patient's life. Moreover, septoplasty is one of the most common types of surgery in ENT. **Material and methods:** The study group consisted of 51 patients (patients over 18 y.o., with septal deviation and chronic nasal obstruction lasting at least 3 months, and persistent symptoms after a 4-week of medical therapy (such as nasal steroids, oral or topical decongestants, oral antihistamine/decongestant combination). Patients were asked to complete the Nasal Obstruction Symptom Evaluation (NOSE-POL), the Visual Analogue Scale (VAS), as well and the Clinical Global Impression Scale (CGI-S). **Results:** The statistical analysis has shown that there was a significant improvement in nasal obstruction after septoplasty (observed in 3 and 7 months after the surgery) in comparison to the baseline NOSE-POL scores (tested 2 weeks before the surgery). However, the comparison between 3-month follow-up and 7-month follow-up scores was statistically significant. The VAS scores before and after septoplasty also show a statistically significant improvement in nasal congestion. **Conclusions:** Nasal obstruction may impact the patient's life. However, septoplasty as one of the nasal surgeries leads to significant quality of life improvement in patients with nasal congestion.

1521

BILATERAL SEVERE HYPOPLASIA "LIMITED" TO PARANASAL SINUSES AND TURBINATES: A UNIQUE CASE

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Poster Session | Rhinology - miscellaneous | 18 June – 22 June, 2023, All day

INTRODUCTION: Anatomical variations in the paranasal sinuses (PNS) and turbinates are consequence of a complex embryologic process in which the cartilaginous nasal capsule is involved. **CASE REPORT:** A 44-year-old male presented bilateral nasal obstruction, bronchiectasis, and azoospermia. Nasal endoscopy showed severe hypoplasia of the turbinates and a well- developed nasal septum. Computed tomography revealed the aplasia of ethmoidal cells and frontal sinuses and a severe hypoplasia of both maxillary and sphenoidal sinuses. Also, a tracheocele was evidenced. Diagnostic studies were negative for primary ciliary dyskinesia and cystic fibrosis (PCD and CF) but demonstrated hypogammaglobulinemia. **DISCUSSION:** We do not find previous cases of isolated severe hypoplasia of both, PNS and turbinates. Developmental anomalies of the cartilaginous nasal capsule (around 8th week of pregnancy) may have occurred. PCD and CF can cause bronchiectasis, azoospermia, and some degree of PNS hypoplasia, but tests were negative. Hypogammaglobulinemia may cause bronchiectasis and the tracheocele could be secondary to chronic cough, or congenital due to developmental anomalies (around 6th week of pregnancy). **CONCLUSIONS:** We report a case of bilateral severe hypoplasia of PNS and turbinates. Moreover, our patient might present an apparently unique syndrome related with developmental anomalies (around 6th- 8th week of pregnancy) and hypogammaglobulinemia.



1525

Clinical evaluation of a Polish translation and cross-cultural adaptation of the Nasal Obstruction Symptom Evaluation (NOSE) Scale

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Poster Session | Rhinology - miscellaneous | 18 June – 22 June, 2023, All day

Nasal obstruction is the most common rhinologic ENT disorder. This paper aims to present the evaluation of a Polish translation, and the cross-cultural modification of the Nasal Obstruction Symptom Evaluation (NOSE) scale (developed by Stewart et al. 2004). The Scale is a widely used for the evaluation of symptoms and quality of life in patients with nasal obstructions. Material and methods: The study group consisted of 51 volunteers (aged 18-62) with nasal obstruction after septoplasty. The control group consisted of 51 patients without rhinology or Eustachian tube dysfunctions (18-62). The inclusion criteria: over 18 y.o., septal deviation with chronic nasal obstruction, persistent symptoms after a 4-week of treatment (e.g. nasal steroids, oral antihistamine/decongestant combination). Patients from the study group completed the NOSE questionnaire three times (2 weeks before surgery, a day before, and 3 months after the surgery), when patients from the control group only once. Results: The Polish translation (NOSE-POL) was performed by two translators and verified by two senior ENT consultants. Next, it was given to a group of 15 patients to check their understanding of the translation. Taking patients' comments, the final version of NOSE-POL was developed. Results of the study have shown good internal consistency, reproducibility, validity, responsiveness, and interpretability of the NOSE-POL. Conclusions: The NOSE-POL is the first questionnaire adapted and validated for the assessment of the quality of life in patients with nasal obstruction after nasal surgery.

1563

Complications in septoplasty – an experience of World Hearing Center, Poland

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Poster Session | Rhinology - miscellaneous | 18 June – 22 June, 2023, All day

Introduction: This poster aims to present possible complications after septoplasty and septoplasty with turbinate reduction. Nasal airway obstruction is one of the most common diseases reported to ENT and septoplasty is one of the most frequent types of surgery in ENT. **Material and methods:** The study was performed between 2009-2016 (7 years) in 5639 patients aged 16-69, including 2855 patients after septoplasty with turbinate surgery. The predominance of male patients was observed. The occurred complications were collected by analyzing the patient's medical records. **Results:** Numerous complications after septoplasty and septoplasty with turbinate reduction were observed. Different types of complications were observed in 193 patients. The most frequent complication in septoplasty and septoplasty with turbinoplasty was excessive bleeding. We noticed also septal perforation, hyposmia, prolonged healing, adhesions, tooth/upper lip anesthesia, and ocular complications (such as a temporary reduced visual activity). Among these, hyposmia, adhesions, hemorrhage, infection, and ocular complications were more often observed in the group with concomitant turbinoplasty, as well as full recovery after septal surgery was longer in that group. **Conclusions:** One of the most frequent complications of septoplasty, and septoplasty with turbinoplasty was excessive bleeding. Additionally, some complications were more frequent in the second group. Precision in identifying the anatomy and maintaining good visualization is crucial in performing safe and effective septoplasty in general.



1601

Unilateral choanal atresia masquerading as chronic rhinosinusitis - Two case reports

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Poster Session | Rhinology - miscellaneous | 18 June – 22 June, 2023, All day

Introduction: Choanal atresia is a rare congenital malformation of the nasal cavity. In cases of bilateral obliteration of the posterior choanae, diagnosis of this condition is made soon after birth. Infants will become temporarily cyanotic as they tend to breathe through their nose, this normally causes the infant to cry and thus causes oral ventilation. Recognising the condition and establishing an immediate airway is extremely important. Conversely, patients with unilateral defects often do not have any breathing difficulties after birth and so are not identified in infancy. Symptoms are less specific and diverse in nature, leading to its misdiagnosis and unwanted treatment. We report two cases of adults with unilateral choanal atresia, both of whom regrettably followed the path of delayed treatment due to lack of awareness particularly in adults. Once diagnosed, initially by CT scan and confirmed by endoscopic evaluation, surgical treatment remains the mainstay of definitive treatment. **Methods:** Surgery was performed using endoscopic transseptal approach which involved corrective surgery, treatment of the posterior third of the septum to create the choanal opening, mucosal preservation and creation of flaps. **Results:** Complete resolution of symptoms and patency of the new choanal opening was achieved in both cases. **Conclusion:** Awareness and detailed history, examination and exploratory investigations are essential to diagnose unilateral choanal atresia in adulthood. This pioneering transseptal repair technique is highly effective in treatment of unilateral choanal atresia



1725

Validation of the Korean version of NOSE-Perf scale on patients with nasal septal perforation

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Poster Session | Rhinology - miscellaneous | 18 June – 22 June, 2023, All day

Background: Generally, nasal septal perforation (NSP) treatment is considered only when there are symptoms due to septal perforation. However, the lack of validated NSP-specific symptom assessment instrument limits treatment decisions and evaluation of treatment effectiveness. Considering crusting, whistling sound, and epistaxis are frequently reported perforation symptoms, previous nasal obstruction symptom evaluation (NOSE) scale or sinonasal outcomes test-22 (SNOT-22) have limitation in usefulness. The NOSE-Perf scale was recently proposed and validated by Cullen M et al. for assessing NSP symptoms. In this study we evaluated the validity of the Korean version of NOSE-Perf scale. **Methods:** The 12-item NOSE-Perf scale was designed using a 5-item NOSE scale and an additional 7 non-obstruction questions. Questionnaires were completed by 36 patients with NSP, 40 with only nasal obstruction, and 40 without any complaints. **Results:** Nasal congestion and nasal obstruction were noted in 88.9% of patients, respectively, and nasal dryness/crusting, and trouble breathing through nose followed in prevalence. Cronbach's alpha was 0.788, indicating good internal consistency. The mean NOSE-Perf score was significantly different among the 3 groups, which was highest in NSP, followed by nasal obstruction, and control group (16.97 vs. 13.03 vs. 1.30), while the mean NOSE score was highest in nasal obstruction, followed by NSP, and control group (12.20 vs. 8.72 vs. 0.50). **Conclusions.** The Korean version of NOSE-Perf scale is a valid clinical assessment tool that can be applied to NSP patient.



Rhinoplasty

1755

Overview of dorsum camouflage grafts in rhinoplasty

Olga Chernova, Yuri Rusetsky

Poster Session | Rhinoplasty | 18 June – 22 June, 2023, All day

Camouflage grafts in rhinoplasty show a good aesthetic result both in revision rhinoplasty and primary rhinoplasty in patients with thin skin on the dorsum of the nose. The variety of materials and their behavior in the postoperative period remains a topical issue. The presentation will provide an overview of grafts, highlighting their benefits and limitations of use. Clinical examples will also be presented depending on the type of material.



1346

Ultrasonic septoplasty

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Poster Session | Rhinoplasty | 18 June – 22 June, 2023, All day

Ultrasonic septoplasty /USS/ is a new technique to correct deviations and spurs on bony part of nasal septum— perpendicular plate, vomer, anterior nasal spine and maxillary crest. Using the ultrasonic scalpel with precise accuracy and atraumatic approach, all part of the bony anatomy of nasal cavity could be fixed in the midline. All surrounding soft tissues are not torn and avoid damaging underlying blood vessels and nerve supplies. As a result post surgery recovery is fast and easy with minimal risk of post surgical complications.



1360

Complications in septorhinoplasty

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Poster Session | Rhinoplasty | 18 June – 22 June, 2023, All day

Introduction: Septorhinoplasty is a surgical procedure used to correct nasal obstruction caused by a deviated septum and to correct the shape of the external nose. Complications that can occur after this procedure include excessive bleeding, septal perforation, wound infection, septal abscess, saddle nose, abnormal nasal tip shape, anterior nostril asymmetry, hyposmia and ocular or intracranial complications. The aim of the study was to identify complications in septorhinoplasty and analyse the incidence based on material from 2001-2021. **Methods:** Material consisted of 156 medical records from patients aged 17-64, operated in the tertiary referral center. 109 patients gave a history of nasal trauma. Only 10 of them had nasal bone repositioning performed after the injury. **Results:** Among the whole study group, different types of complications were noted in 25 patients (16%). The most frequent complication was deviating nasal tip and nasal bones asymmetry. 5 patients (3,2%) underwent reoperation. **Conclusion:** In our material the most common complication after septorhinoplasty was persistent asymmetry of the external nose, which was related to massive post-traumatic deformities. There were no serious complications such as hyposmia or ocular or intracranial complications. Commitment to proper postoperative care must be emphasised to the patient and is crucial to the healing process. Meticulous attention to detail in identifying the correct anatomy and maintaining good visualisation is key to a safe and successful functional septorhinoplasty that results in improved nasal passage.



1480

Complications of Nonsurgical Rhinoplasty: A Systematic Review

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Poster Session | Rhinoplasty | 18 June – 22 June, 2023, All day

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Abstract Background: Nonsurgical rhinoplasty using filler injections has become one of the most common noninvasive cosmetic procedure. It is a safe technique for addressing conditions requiring facial sculpturing offered to patients that mainly prefer to avoid general anesthesia. Although rare, complications with this procedure may occur. **Methods:** We conducted a systematic review of literature using PubMed, Cochrane Library and Embase database regarding complications of nonsurgical rhinoplasty. We included publications and reviews of the last decade. **Results:** Nonsurgical rhinoplasty with injectable fillers has low rate of complications. The most common adverse effects reported are bruising and hematomas. However, there are reports of serious complications such as allergy, vascular compromise, skin necrosis, blindness and infection. **Conclusions:** Nonsurgical rhinoplasty is not without potential risk. Further studies are needed to optimize delivery of injectable fillers in the nose to decrease the rate of adverse outcomes.



1681

NASAL RESHAPING WITH HYALURONIC ACID – A SYSTEMATIC REVIEW

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Poster Session | Rhinoplasty | 18 June – 22 June, 2023, All day

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Septal and turbinate surgery

1180

Coblation Nasal Septal Swell Body Reduction for Treatment of Nasal Obstruction: A Preliminary report

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

The nasal septal swell body (NSB) comprises thickened mucosa of the anterior nasal septum located superior to the inferior turbinate and anterior to the middle turbinate, and is thought to play a role in the regulation of nasal resistance. The midportion of the NSB is located in or near the internal nasal valve, which can increase nasal resistance. However, little attention has been paid to the NSB, and few studies on clinical impacts of abnormally thickened NSB have been conducted. Coblation (short for cold ablation) is effective and safe technique for the treatment of soft tissue, and frequently used electrosurgical submucosal technique for the treatment of inferior turbinate hypertrophy. In this report, we describe the results of coblation NSB reduction in eight patients with nasal obstruction and abnormally thickened NSB.

1193

A decellularized mucosa patch derived from porcine tracheal tissue prevents septal perforations in a rabbit model of nasal mucosa injuries

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Several studies have reported that interpositional grafts composed of acellular biocompatible materials may be effective for closing nasal septum perforations, but no previous study has tested whether such interpositional grafts are effective for preventing nasal mucosa injuries from developing into septal perforations. To determine whether decellularized mucosa patches derived from porcine tracheal tissue can prevent nasal mucosa injuries from developing into septal perforations. Bilateral nasal injuries were surgically induced in 36 rabbits. In the control group (n = 12), silastic sheets were applied to the injuries. In the experimental groups, decellularized mucosa patches were unilaterally (n = 12) or bilaterally (n = 12) applied to the injuries. At postoperative timepoints between 1 and 8 weeks, the rabbits were sacrificed, and the cartilaginous septa were extracted and examined for perforations. Mucosal defect areas were measured. Hematoxylin and eosin staining and safranin O staining were used to visualize mucosal regeneration and cartilage remodeling, respectively. Septal perforations occurred in 5 control group rabbits (42%), 1 rabbit that received a unilateral patch (9%), and none of the rabbits that received bilateral patches. Relative to the control group, the rabbits that received patches had smaller mean mucosal defect areas at the 1-week (P = 0.027) and 4-week (P = 0.039) postoperative timepoints. Mucosal regeneration was observed around the patches, and cartilage remodeling was seen in patch-treated septa.



1195

Septal perforation closure with temporalis fascia and nanofat

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Poster Session | Septal and turbinate surgery 18 June – 22 June, 2023, All day

IntrudactionThe main reason of perforation development lies in the trophic disorder of cartilage and mucous membrane. **Material and methods** Group of patients n=32. The average size of the perforation was 20mm x 30mm. Operation technique: separating the mucoperichondrium of the septum, renewing the edges of the perforation. A deep leaf of the temporal fascia was removed. The next stage was a superficial fat collection. The obtained mass was settled to separate fatty tissue and blood then it was centrifuged. 20 cm³ of microfat was obtained. Grinding of fat was carried out> passes through sieves with a diameter of 25, 50, 100 microns. The obtained fraction of nanofat (4 ml) was infiltrated into the temporal fascia with implantation into the pocket of the septum mucose with complete closure of the defect. **Results**As a result of the observation of 32 patients within 3 months after the operation, in 29 patients there was a complete closure of the perforation of the nasal septum, in 4 of which small defect of graft tissue was determined, which slightly disturbed nasal breathing. **Conclusions**This method provides complete closure of the perforation of the nasal septum up to 3.5 x 4.2 cm.

**1246**

A novel surgical technique to correct caudal and high dorsal septal deviations: L-shape cutting and suturing on the septal L-strut (L-septoplasty)

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Objectives: In general, deviation of the L-strut of the nasal septum is more challenging to correct than the middle and has less favorable results. This study aimed to develop a technique to correct the L-strut while preserving nasal support effectively and introduce the L-septoplasty technique and its effects. **Methods:** Patients with caudal and high dorsal septal deviations who underwent the L-septoplasty technique were retrospectively analyzed. Preoperative and three month postoperative comparative assessments included the Nasal Obstruction Symptom Evaluation (NOSE) scale and minimal cross-sectional area (MCA). **Results:** Thirty patients seen at a tertiary care center were included. NOSE scale scores improved from 47.2 to 13.6, which was statistically significant ($P < .001$). MCA increased from 0.43 cm² to 0.74 cm² ($P < .001$). During the 3-month follow-up period, deviation correction was well maintained in all patients, and no surgical complications, such as saddle nose deformity, occurred. **Conclusion:** The L-septoplasty technique is effective in simultaneously correcting caudal and high dorsal septal deviations without any complications.

1260

Radiofrequency treatment of the inferior Nasal Turbinate hypertrophy

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Introduction: The hyperplasia of the inferior nasal turbinate is a widespread reason for the chronically obstruction of the nasal respiration. A variety of surgical procedures are performed for reduction of hyperplastic inferior nasal turbinates. The multitude of methods reflects the challenge for an ideal treatment. RF generator BM-780 for the treatment of concha hyperplasia by Ravor is evaluated clinically. **Material and Methods:** 1017 patients (age 5-72) who underwent submucosal turbinotomy with RF generator BM780, between 2010-2022, were examined preoperatively and 1-3-5 weeks postoperatively by endoscopy and rinomanometry. 175 patients were examined also 1-11 years postoperatively. After local anesthesia the "Binner" bipolar needle electrode was inserted (5-9 sec all intensive level 2-2.5) in the submucosal tissue of the inferior turbinate head, body and posterior part. **Results:** RF surgery is performed under local anesthesia without postoperative use of nasal tampons. Intra and postoperative pain is extremely low. A shrinkage of the concha could already be observed during the coagulation. During 1-3 weeks postoperatively 900 of 1017 and during 3-5 weeks postoperatively 117 of 117 patients showed a reduction of inferior turbinate volume.



1345

Effect of nasal packing in the postoperative recovery of the patient

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Nasal packing is used after septoplasty with the goals of decreasing the risk of postoperative bleeding, septal haematoma and adhesions. There is no generally standard for which types of materials should be used or how long packs should remain placed. On the market, there are many different products for use after septoplasty: Merocel, sponge, splint, Rapid Rhino, Netcell, Sugomed, Miculicz packs et al. Results of this work confirm that nasal packing with Merocel has significant advantages over the Miculicz packs with sponges.



1635

Exploration of surgical treatment of posterior nostril atresia after radiotherapy for nasopharyngeal carcinoma

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

To investigate surgical interventions for radiotherapy-induced posterior nostril atresia in nasopharyngeal carcinoma patients, identifying factors associated with postoperative recurrence and assessing treatment efficacy. 10 patients with radiotherapy-induced posterior nostril stenosis after treatment for nasopharyngeal carcinoma from January 2010 to December 2022 (8 males, 2 females). All of them underwent nasal endoscopic posterior nostril plasty at our hospital, involving the use of a Coblation and removal of bone to enlarge the bony posterior nostril. Postoperatively, the cavity was tamponaded and absorbable sinus stents were inserted. Patient symptoms and complications were monitored, and all 10 patients showed significant improvement in nasal congestion, runny nose, mouth breathing, and dry mouth. At mean follow-up of 16.5 months, no restenosis or atresia was observed, and nasal endoscopic posterior nostril plasty was found to be the primary treatment. To minimize recurrence rates, consider intraoperative factors such as post-plasty nostril size, mucosa preservation, mucoperiosteal flap use, and regular endoscopic monitoring.



1218

Changes in Subjective Outcomes during the Early Period after Septoturbinoplasty

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Introduction: Septoturbinoplasty is frequently performed to correct nasal obstruction; however, there is still a lack of research on changes in nasal and nose-related symptoms early after septoturbinoplasty. Therefore, we aimed to investigate changes in subjective outcomes within 6 months after septoturbinoplasty. **Materials and Methods:** The medical records of patients who underwent septoturbinoplasty at Gangnam Severance Hospital were retrospectively analyzed. Symptom scores were evaluated using the Sino-nasal Outcome Test (SNOT-22) and obstruction scores. The SNOT-22 and obstruction scores were investigated before surgery and at 1, 3, and 6 months after surgery. **Results:** We noted significant decreases in both SNOT-22 and obstruction scores at 1 month after surgery, compared to those before surgery ($p < 0.001$). However, there were no significant changes at 3 and 6 months after surgery, compared to scores at 1 month after surgery. Using multivariate logistic regression analysis, a larger difference between SNOT-22 scores preoperatively and 1 month after surgery was significantly associated with a significant improvement in symptoms at 3 or 6 months after septoturbinoplasty ($p = 0.029$). **Conclusion:** These results imply that subjective outcomes and degree of improvement in the first month after septoturbinoplasty can be used as a predictor of the results thereof and for counseling patients about its progress.



1242

Endonasal approach septorhinoplasty: Is it coming back in fashion?

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Objectives Surgical intervention for nasal and septal deviation is frequently undertaken, but there is an ongoing debate regarding open and closed approach. The aim of this project is to contribute to this debate by presenting our evaluation of a single surgeon performing only endonasal approach septorhinoplasty surgery for three years. **Methods** Retrospective data collection was conducted regarding patients with endonasal septorhinoplasty. The postoperative results were assessed in terms of nasal airway and cosmetic appearance. Early and late complications as well as revision surgery rates were also noted. **Results** Eighty-eight patients had endonasal septorhinoplasty over the course of three years with an average follow-up time of 3.4 months. The nasal breathing improved post-operatively in seventy patients. Only three patients were not satisfied with the external nasal appearance post-operatively. Sixteen patients had residual septal deformity. Eighteen cases of early and seven of late post-operative complications were documented, including pain, epistaxis, infection, hyposmia and septal perforation. Two patients needed revision surgery. **Conclusion** Endonasal septorhinoplasty is a successful and safe surgical technique that can be utilised in most cases of septal deformity, as it was used by one surgeon in our department for all of their cases in a three-years span with good results.



1395

Narrow band imaging accentuates differences in contrast between cartilage and perichondrium in the elevation of the muco-perichondrium flap during septoplasty and open septorhinoplasty

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Objective: In the elevation of the muco-perichondrium flap during septoplasty and septorhinoplasty, it is important to elevate the subperichondrial layer. Narrow band imaging (NBI) is an optical technology that facilitates detailed observation of microvessels in the mucosal surface layer. In this study, we investigated whether NBI is better than white light (WL) in accentuating differences in contrast between cartilage and perichondrium in the elevation of the muco-perichondrium flap during septoplasty and septorhinoplasty. **Methods:** Twenty-six sides of 15 patients with elevated muco-perichondrium flaps were studied under WL endoscopy and NBI. The brightness of the perichondrium and cartilage and the differences between the two tissues were compared between WL and NBI using ImageJ 1.53a. **Results:** Under WL, the perichondrium appeared reddish-white and the cartilage appeared white, whereas under NBI the perichondrium appeared greenish-gray, differentiating it from the white cartilage. The difference in brightness between the cartilage and perichondrium was significantly higher on NBI than on WL imaging ($p < 0.001$). **Conclusions:** NBI is better than WL at accentuating the difference in contrast between cartilage and the perichondrium during the elevation of the muco-perichondrium flap during septoplasty and septorhinoplasty.



1412

Septoplasty: Are we listing patients correctly?

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Background: Septoplasty (surgery to correct a deviated septum) is a common ENT procedure, however many patients are listed for this procedure without adequate symptom assessment. We assessed the severity of symptoms of the patients waiting for septoplasty using the NOSE (Nasal Obstruction Symptom Evaluation) questionnaire. The NOSE questionnaire is a validated five-item symptom scoring system. A score of 30/100 or above is considered as meeting the threshold for surgery. **Method:** A telephone or email survey was addressed to a total of 270 patients on the waiting list. We also had additional questions regarding previous nasal surgery, trauma or unilateral symptoms. **Results:** 136 patients from the 270 patients responded to the survey. Results demonstrated that only 11/136 (8%) patients had a score below 30. 60/136 (44.1%) had a score above 80 considered 'extreme' severity. Notably 15.4% had a history of previous nasal surgery whilst 38.2% had a history of nasal trauma. 50.7% of patients had unilateral symptoms. **Discussion:** The NOSE questionnaire provides a valuable tool to quantify and monitor symptoms. Our study demonstrated that the majority of patients (92%) were correctly listed for the procedure. It also showed that unilaterality of symptoms is not part of the indication for septoplasty. Future studies of improvement in NOSE score following septoplasty are needed.



1425

How common are permanent complications following septoplasty, with or without concomitant turbinate surgery in Scania, Sweden. Review of the Swedish National Septoplasty Register

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Background: The aim of this project was to collate the registered permanent complications of septoplasty in our province. Furthermore, we sought to investigate, both the link between permanent complications and whether concomitant turbinate surgery was performed, and the link between unplanned postoperative follow-up and reported complications. The final aim was to try to verify self-reported septal perforations in the registry. **Methodology:** A retrospective register study was performed analysing data from operated patients in the southern part of Sweden between 2013-11-1 and 2019-12-31 collected from the Swedish National Septoplasty Register. The registry contains information from patient questioners 1 and 12 months postoperatively about among other data the presence of a permanent complication and unplanned visits within 30 days after surgery. **Results:** 28,3% of patients reported a permanent complication on the 12 month postop-questioner (46% of the patients answered). There was no statistical significant difference ($p=0,235$) in the complication rate whether concomitant turbinate surgery was performed or not. The patients who reported an unplanned follow-up were also more likely to report a complication ($p=0,003$). Of the 12 self-reported septal perforations only 1 was verified. **Conclusion:** Unplanned visits were associated with permanent complications at 12 months and routine follow-up should be considered.

1561

Post-Septoplasty Neuralgia: A Case Report

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Introduction: Septoplasty is a common surgical procedure, with persistent subjective nasal obstruction being the most frequent complication. However, post-septoplasty neuralgia is an uncommon complication. This case report presents a rare case of persistent nasal and palatal pain after primary septoplasty. **Case study:** A 41-year-old female smoker presented to an ENT consultation with persistent nasal and palatal pain one month after an uncomplicated septoplasty. The pain was associated with thermal stimulation, and there was no persistent septal deviation or contact point with lateral nasal walls. Symptoms were refractory to oral analgesics and oral rinses with Chlorhexidine, and the patient was referred to a Neurology consultation. **Discussion:** Intraoperative nerve damage is a well-known clinical risk factor for chronic postsurgical pain; however, there are only three published articles related to post-septoplasty neuralgia. Nonoperative management through peripheral maxillary nerve blocks followed by radiofrequency ablation (RFA) has demonstrated complete resolution of symptoms. Furthermore, a combination of medication and cognitive-behavioural therapy can also lead to significant improvement in symptoms. **Conclusion:** Post-septoplasty neuralgia is a rare complication of septoplasty, with only three other case reports published in the medical literature. Successful management strategies include peripheral maxillary nerve blocks followed by RFA. Further research is needed to evaluate both pharmacological and non-pharmacological management strategies.



1726

JUSTIFICATION OF SURGICAL TREATMENT OF MALFUNCTION OF THE NASAL BREATHING DUE TO NASAL SEPTAL DEFORMATION IN CHILDREN AND ADOLESCENTS

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Impaired nasal breathing in childhood leads to hypoxia of the growing body which can lead to malfunction of the other organ-systems. Although, septoplasty in children still remains a controversial issue in otorhinolaryngology. The aim of this study was the clinical and functional justification for necessity of surgical treatment of trespassing nasal breathing due to deformed nasal septum in children. The research involved 452 children aged 4-14 years, that have been operated on ENT department of Nairi MC in the period of 2013-2019 and Muratsan MC in the period of April 2021 to February 2023. Septum deformation, combined with adenoid growths were in 291 patients, 20 children also had unilateral choanal atresia (membranous). Septoplasty with reimplantation of septal cartilage, lateroposition and coagulation of the inferior nasal conchae were performed in this cases, also adenotomy and excision of choanal atresia if necessary. A 6-month postoperative observation was performed in 155 patients, was done rhinoendoscopy, 4 phases anterior active rhinomanometry. Clinical examination revealed that nasal breathing was restored in 140 patients (90%), while insufficient restoration of the respiratory function of the nose due to repeated nasal septal deformation (spontaneous or post-traumatic) was observed in 18 patients (12%). Hereby, can be concluded that septoplasty with the reimplantation of the nasal cartilage, performed with modern gentle methods, is necessary for the restoration of the respiratory function in children.



1748

Endonasal Endoscopic Septal Perforation Repair

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Nasal septal perforation is a frequent problem which may be caused by primary or secondary etiologies. However, in both etiologies, bilateral disruptions of septal mucoperichondrium and destruction or resection of quadrangular cartilage have been occurred. While patients with posterior perforations are usually asymptomatic, most patients may have different symptoms which depends on the location and size the perforation. With the large perforations, laminar airflow will be displaced by turbulence with resultant sensation of nasal obstruction, decreased nasal temperature and humidity and finally dryness and mucosal injury. Secondary rhinorrhea, crusting, epistaxis and infectious are consequences of septal perforations. In extensive perforations, loss of dorsal support may cause saddle nose deformity. Septoplasty with or without rhinoplasty is the most common cause of septal perforation. Repair of the large septal perforations has been a challenge for most of rhinologists and facial plastic surgeons. Various methods have been explained for repair of a septal perforation. Using a 0 degree 4mm endoscope, an incision was made in the lateral nasal wall mucosa, just below the inferior turbinate. Then the incision was extended to posterior direction, where it was turned up to get more mobility before transposition. The most important key for success is to provide very large vascularized floor of nose flaps to make a relaxed closure without any tension.



1774

Septal perforation repair: revisiting different approaches

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Poster Session | Septal and turbinate surgery | 18 June – 22 June, 2023, All day

Nasal septal perforation corresponds to a defect of the cartilaginous and/or bony nasal septum. Besides being a rare entity, its surgical correction remains one of the most challenging nasal septal procedure. Endoscopic repair has revolutionized the approach of this type of defect. Depending on the location, size, and remaining osteocartilaginous support, flaps such as the anterior ethmoidal artery flap, the lateral wall flap, pericranial flap, amongst others may be used. The authors present different clinical cases that have one thing in common: the nasal septal perforation. With different etiologies, sizes, and locations, the technique used was different. Moreover, we revisit the different approaches, describing advantages and disadvantages of each one of them



Sinonasal malignancy

1500

NK- and T-cell lymphoma of the nasal cavity and paranasal sinuses in Denmark 1980-2017: a nationwide cohort study

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Compared to Asian and Latin American populations, sinonasal NK- or T-cell lymphoma is rare in Europe. All patients with sinonasal NK- or T-cell lymphoma in Denmark from 1980 to 2017 were validated histologically, and the disease behavior and demographics were extracted from medical records and national registries. Prognostic factors associated with mortality were determined using survival statistics. We included 56 patients: 40 extranodal NK/T-cell lymphoma (nasal type) (ENKTCL) and 16 peripheral T-cell lymphoma (not otherwise specified) (PTCL). The median age was 66, and most patients were male (72%). The ENKTCL and PTCL 5-year overall survival was 48% and 50%, respectively; progression-free survival was 38% for both. With ENKTCL, stage and performance status increased mortality significantly (HR = 8.6; p



1142

Non-intestinal type sinonasal adenocarcinoma: A case report

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Introduction: Primary adenocarcinomas of the sinonasal tract are a group of malignant neoplasms that represent 10%-20% of all primary malignant neoplasms of the nasal cavity and paranasal sinuses and are classified into salivary types (10%) and non-salivary, within this last group they are classified as intestinal type adenocarcinoma (ITAC) and non-intestinal. **Material and methods:** We present the case of an 87-year-old female patient with hypertension, diabetes, operated on for breast cancer and knee replacement who was referred by the Radiologist due to the discovery of a mass in the skull and nostril right. The patient had previously been seen by a private otolaryngologist for an occupying and bleeding lesion in the right nostril with a progressive evolution of one year and causing right nasal respiratory failure, for which a CT scan of the paranasal sinuses was requested. Nasofibroscope revealed a bleeding mass that occupied the entire right nostril. A biopsy of the mass was taken for analysis. **Results:** CT revealed a solid frontobasal extraaxial hyper-uptake mass of the right anterior cranial fossa that entered into the right nasal fossa and extended to the right ethmoid, cavum, and extraconal fat infiltration of right orbit. The biopsy revealed the result of infiltrating adenocarcinoma, compatible with "non-intestinal type" sinonasal adenocarcinoma of intermediate grade. The patient was taken to the tumor committee, however, before making a therapeutic decision for the patient, she died. **Conclusion:** In summary, the etiology and risk factors are unknown.

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Comparison of Primary B/NKT non-Hodgkin lymphomas in Nasopharynx, Nasal cavity and Paranasal sinuses

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Objective: We aimed to compare clinical and survival differences of B-cell (B-NHL) and NKT-cell non-Hodgkin lymphomas (NKT-NHL) located in nasal cavity, nasopharynx and paranasal sinuses which always categorized as onesinonasal type. **Methods:** Patients diagnosed with primary B-NHL and NKT-NHL in nasal cavity, nasopharynx and paranasal sinuses from SEER database were included(1975–2017). We conducted Cox regressions and Kaplan–Meier analysis to examine survival outcomes of B/NKT-NHL in nasal cavity, nasopharynx and paranasal sinuses, respectively. **Results:** Overall, most B-NHL cases originated from nasopharynx, while majority of NKT-NHL cases occurred in nasal cavity. Notably, the CSS outcomes improvedsignificantly in all sinonasal B-NHL cases over time, whereas no such improvement trend was observed in each sinonasal NKT-NHL type. Additionally, increasing age was linked with an elevated risk of death in B-NHL, particularly in nasal cavity(HR: 3.37), rather than in NKT-NHL. Compared with B-NHL, adverse effect of higher stage on CSS were more evident in NKT-NHL, particularly in its nasopharynx site(HR: 5.12). Furthermore, radiotherapy was beneficial for survival in patients with sinonasal B-NHL and NKT-NHL, except in nasopharynx NKT-NHL. However, chemotherapy has only been beneficial for CSS in patientswith paranasal sinuses B-NHL(HR: 0.42) since 2010, rather than in other typesof B/NKT-NHL. **Conclusions:** Although B-NHL and NKT-NHL in nasal cavity, nasopharynx andparanasal sinuses have similar anatomical locations, their clinicodemographics and prognoses are largely different.



1183

Malignant Mucosal Melanoma of the Nasal Cavity: A Rare Case Report - No Local Recurrence with a Follow-up of 3 years

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Malignant mucosal melanoma of the nasal cavity is a rare and aggressive tumor with a poor prognosis. Epistaxis and unilateral nasal obstruction are the most common presenting symptoms. Accurate diagnosis is immunohistochemical staining analysis for HMB-45, S-100 and Melan-A. The treatment of choice is surgical resection if the tumor is resectable. In our case report, a 72-years-old male came with left epistaxis for 2 months. An endoscopic examination showed a bleeding tumor at the left inferior turbinate with protrusion into the left sided nasopharynx. CT and MRI revealed the enhancing mass in posterior left nasal cavity involving left inferior turbinate with protrusion into left sided nasopharynx, measured about 3.3x1.5x1.4 cm. No gross bony destruction is detected. An incisional biopsy was performed and the immunohistochemical staining analyses are positive for HMB-45 and S-100. The findings indicated stage III, T3N0M0. Endoscopic medial maxillectomy with partial nasopharyngectomy with PE tube insertion was performed under general anesthesia and the frozen sections are negative intraoperative margins. Then he was receiving postoperative radiotherapy. At a 3-year follow-up, the patient showed no evidence of local recurrence.



1250

Sinonasal adenoid cystic carcinoma: surgical resection and reconstruction case report

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Objective: Adenoid cystic carcinoma (ACC) is a rare salivary gland malignant cancer of the head and neck and particularly rare in the sinonasal area compared to the major salivary glands. ACC displays a combination of an indolent growth pattern but an aggressive progression, with local recurrence and distant metastasis. We purpose to present the case of sinonasal ACC and its surgical treatment and reconstruction. **Material and Methods:** Clinical examination, medical imaging and immunohistochemical stains were checked. We also briefly review the relevant literature about ACC and sinonasal tumors resections. **Results:** We describe a 50-year-old man who presented with two-year intermittent rhinorrhea and epistaxis. Clinical examination revealed a mass occupied both nasal cavities and hard palate. The peculiar anatomical location and the extent in the midcheek region make this case a hard "challenge" for the surgeon to guarantee wide surgical margins of resection. A subtotal bilateral maxillectomy was accomplished by means of the Weber-Ferguson approach, preserving the orbital floor. The excised portion was reconstructed using the free scapula osteocutaneous flap. Postoperative radiotherapy was given to the area adjacent to the lesion. **Conclusion:** A combined clinico-radiological approach aided by histopathology examination helps in better management of this carcinoma. Vascularized free scapular flap bone graft is very interesting for the reconstruction of maxillary discontinuity, secondary to oncologic resections.

1256

Total Maxillectomy with Orbital Exenteration for Carcinoma of Maxilla and Latissimus Dorsi Free flap Reconstruction

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Objective: Orbital involvement in maxillary tumors is an important prognostic predictor of recurrence-free, disease-specific, and overall survival. Defects resulting from total maxillectomy require a complex reconstruction procedure. We present the case of a squamous cell carcinoma of maxilla with orbital involvement and its surgical treatment and reconstruction. **Material and Methods:** Clinical examination, medical imaging and immunohistochemical stains were checked. We also briefly review the relevant literature about maxillary tumors resections. **Results:** We describe a 69-year man who presented with a 2 month history of progressive swelling of the left malar and left sporadic epistaxis. These symptoms had worsed and started to present diplopia and left tearing. On clinical examination, the growth was arising from the left maxilla with involvement of orbital floor. On anterior rhinoscopy the growth was abutting the nasal septum. She underwent total maxillectomy with orbital exenteration by Weber Ferguson incision with subciliary and supraciliary extension. The reconstruction was completed with a Latissimus dorsi myocutaneous free flap. Post operative period was uneventful. **Conclusion:** The multivector extensions of this carcinoma obliged the a complete resection of the maxilla, including orbital floor. The muscle compartment is suitable to fill the orbital and maxillary cavities and skin compartments are used for cheek, palate and lateral nasal wall as a three-dimensional folded free flap.

1296**Orbital exenteration in sinonasal malignancies: has it still a role in nowadays?****José Miranda¹**, Fernando Mar¹, António Lima¹, Luis Dias¹¹*Hospital of Braga, Braga, Portugal*

Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Background: sinonasal malignancies are a rare group of lesions corresponding to less than 3% of head and neck malignant neoplasms. They include a large variety of histological subtypes with different biological and clinical behavior. Despite the greater accessibility of complementary diagnostic tools, these tumours still present in advanced stages, with invasion of neighboring structures such as orbit and the skull base. Orbit invasion has a negative impact on survival and functional outcomes. Methods: description of two clinical cases of sinonasal malignant tumours with orbital invasion at presentation, who underwent orbital exenteration, and review the current literature on this topic. Discussion: in spite of a recent trend to preserve orbit in cases of minimal involvement, the presence of undoubtedly signs of intraconal invasion such as: visual loss, restriction of ocular mobility or infiltration of the eyeball, may help surgeon in decision making process. In borderline situations, confirmation of orbital involvement should be performed intraoperatively, through endoscopy and frozen sections.



1297

Signet-Ring Cell Adenocarcinoma of Sinonasal Tract: description of 4 clinical cases

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Background: sinonasal malignancies correspond to less than 3% of head and neck malignant neoplasms. Adenocarcinoma is one of the most prevalent histotypes and is classified into 4 categories: salivary-type, intestinal-type, nonintestinal-type, and metastatic. Signet-ring cell carcinoma (SRCC) is the rarest form of intestinal-type adenocarcinoma (ITAC). As with the other variants, they are suspected to be associated with exposure to wood dust and to be associated with a poor prognosis. Methods: description of a series composed of 4 consecutive patients managed in our institution with histological diagnosis of SRCC focusing on the most relevant clinical, imaging and histopathological aspects. Discussion: SRCA is a uncommon subtype of ITCA rarely reported in literature. Is a high-grade and aggressive tumor with a poor prognosis. Immunohistochemical study with p53 protein and MIB-1 may help in diagnosis.

1321

RHINOCEREBRAL INTRAVASCULAR LARGE B-CELL LYMPHOMA

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

INTRODUCTION Intravascular large B-cell lymphoma is a rare type of extranodal large B-cell lymphoma within the lumen of vessels, particularly capillaries. There are two main patterns of clinical presentation: a classic pattern characterized by symptoms related to the main organ affected, predominantly neurological or cutaneous; and another type associated with an hematophagocytic syndrome. **MATERIAL AND METHOD** Immunocompromised 57-year-old patient, diagnosed of nasal polyposis, epistaxis and clear rhinorrhea. Months later, he requires admission for myoclonic encephalopathy, with persistent fever and elevated acute phase markers despite antibiotic treatment. Examination of the cerebral spinal fluid (CSF) shows abundant lymphocytes. Flexible nasal fibroscopy revealed bilateral polyposis. MRI: bone erosion of the clivus and involvement of the paranasal sinuses. CT: full occupation of the maxillary sinuses with an expansive behavior; marked mucosal thickening with hyperdense content and areas of bone erosion, probably related to infectious/inflammatory involvement. **RESULTS** An incisional biopsy was taken for surgical pathology, being diagnosed with intravascular large B-cell lymphoma (immunohistochemistry: ALC +, CD10+, CD20 +, high Ki67) The patient is referred to Hematology and treated with R-CHOP therapy alternating with cycles of MTX + CYTARABINE A. **CONCLUSION** Rare type of non-Hodgkin lymphoma. Intravascular involvement of blood vessels, especially capillaries. It can occur in any organ. Aggressive and with a poor prognosis. Treatment with Rituximab: 3-year survival



1341

Atypical approach in a recurrent orbital-ethmoidal tumor. A case report.

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Introduction. Local recurrences in operated medial canthus carcinomas involve orbital and ethmoid invasion (1). CT scan imaging should be performed with small sections to correctly assess the lesion extension. Oncologic salvage surgery concerns orbital exenterating and ethmoidectomy in a mixed approach to ensure negative margins (2). Materials and method. Case report. Results. We present a 75-year-old patient with carcinoma of the medial canthus of the left eye, initially operated on in 2018 in a plastic surgery service, for coverage using a frontal flap. The patient presented to our service in 2019, with a recurrence in the internal orbital quadrant that was removed through an eyebrow approach. The patient presented a new ethmoidal-orbital recurrence in 2022 for which we performed oncological salvage surgery on an atypical approach with left orbital exenterating, left ethmoidectomy, left medial maxillectomy, and covering the defect with a translated cervicofacial flap. The patient is being monitored. Conclusions. Carcinomas of the medial canthus present a therapeutic challenge for the patient and the doctor. The combined surgical approach in a multidisciplinary team approach offers the best chance for radicality, which is difficult to achieve due to the complex loco-regional anatomy. Keywords: medial canthus, recurrent tumor, ethmoid, orbital exenterating, mixed approach. References: Leibovitch I, McNab A, Sullivan T, Davis G, Selva D. Orbital invasion by periocular basal cell carcinoma. *Ophthalmology*. 2005 Apr; 112(4):717-23. Sun MT, Wu A, Figueir



1348

Rare non-Hodgkin lymphomas found in the sinonasal tract: a case series

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Background: Non-Hodgkin lymphomas (NHL) are the most common solid tumors among lymphomas, usually presented in the lymph nodes. Although the extra-nodal expression of NHL represents only one-third of cases, finding a lymphoma in the nasal cavity or nasopharynx is even scarcer. **Cases:** We present three cases of male patients, with a chief complain of lasting nasal obstruction. In the first case, the otolaryngology physical examination revealed a mass in the anterior part of the left nasal cavity. The histopathological report demonstrated a diffuse large B cell lymphoma (DLBCL), non-Germinal center B-cell (non-GCB) subtype. In the other two cases, the mass was found in the nasopharynx and the histopathological examinations revealed a mucosa associated lymphoid tissue (MALT) and a mantle cell lymphoma (MCL) respectively. All the patients were referred to the Hematology Department of our hospital for further treatment. **Conclusion:** NHL can seldom be found in the sinonasal tract or the nasopharynx. A full physical examination and high clinical suspicion are important for a timely diagnosis and treatment. The treatment could comprise of immunotherapy or chemotherapy or a combination of them.



1404

METASTATIC NASAL MALIGNANT MELANOMA TO THE BRAIN

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

INTRODUCTION: Melanoma arises from melanocytes in pigment-containing tissues. They occur predominantly on the skin, but can also develop on the mucous membranes of the mouth, genital and rectal areas, and conjunctiva. Mucous membrane contains melanocytes with melanin pigment which are found in the basal layer of the epidermis, and in the eyes. They origin from the neural crest. Melanocytes in the nasal cavity can be found in the respiratory epithelium, in the nasal septum stroma, nasal glands and in the middle and inferior turbinates. **MATERIAL AND METHODS:** The authors reported a case of malignant melanoma with sino-nasal region origin in a 65 y.o. female. She presented at ENT Clinic in University Hospital of St. Zagora with unilateral trouble nasal breathing six months ago and some episodes of spontaneous nosebleeds from the same nostril. **RESULTS:** Nasal cavity surgery has been performed for tumor formation removal. 11 months later, the patient was admitted to a neurosurgery clinic at the University Hospital - St. Zagora due to left hemiparesis and symptoms of increased intracranial pressure. CT scan have been performed and two oval formations were found in the supratentorial region. **CONCLUSION:** Metastasis correlates with the depth of penetration into the dermis. Local metastases occur as satellite papules or nodules located near the tumor, which may or may not be pigmented. The diagnosis is made on the basis of biopsy data. Wide surgical excision is the rule when removing resectable tumors. Metastatic disease requires systemic chem



1450

FESS in treatment of the sinonasal tumors. Where is the limit?

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Sinonasal tumors both benign and malignant can be a challenge in surgical management regarding their size, location and growth. While in most malignant cases and in cases of big benign tumors craniofacial resection is the gold standard, the advancement of endoscopic surgery in the last decades allows for expanding its indications. The aim of this presentation is to show different cases of malignant and benign tumors in the nasal cavity and paranasal sinuses managed with an endoscopic approach. We emphasize on the advantages considering the recovery of the patient and share our view on the limitations of endoscopic surgery. Nevertheless, we always consider the possibility to switch to a combined or open approach in these cases as a plan B.

1453**An extremely rare nasopharyngeal malignant tumor**

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Nasopharyngeal papillary adenocarcinoma (NPAC) is an extremely rare primary malignant tumor. There is only a limited number of cases of NPACs reported in the literature. The neoplasm presents as an exophytic mass with a papillary or polypoid appearance derived from the nasopharyngeal surface epithelium. It can potentially involve any part of the nasopharynx, but it most commonly involves the roof, the lateral, and the posterior wall. The prognosis is very good and no recurrences or metastases have been reported. Nasal obstruction is the most common manifestation. Surgical excision is considered the most appropriate treatment method. There are also reports of patients undergoing radiation therapy. However, its role in the treatment has not been clarified. The presence of this tumor in the nasal cavity could be easily underestimated, because of its appearance. As a result, an index of suspicion is necessary for a timely diagnostic and therapeutic intervention. We present a case of NPAC in a 26-year-old female treated in our hospital.



1484

Sinonasal hemangiopericytoma - a rare case report

Daniel Petkov, Valentin Stoyanov, Tsvetelina Grigorova

Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

AbstractIntroduction: Hemangiopericytoma is a rare tumor of the sino-nasal cavity. It is a perivascular myoid neoplasm that account less than 0.5% of the tumors in maxillofacial area. Here we would like to describe a case of an adolescent male who underwent 2 surgeries for this diagnosis because of a recurrence. We make a comparison between the current literature and our experience. **Materials and methods:** The case is from the archive of the clinic from 2015. We evaluated identical cases published in the data base of PubMed and Elsevier. We made of a systematic review of the collected data and our clinical report. **Results:** Our patient presented for the first time with recurring epistaxis, progressive nasal obstruction and anosmia. Rhinoscopic examination and imaging studies showed a mass occupying the left nasal cavity without bone destruction. An endoscopic surgical excision was performed. The anatomopathology examination with immunohistochemistry confirmed the diagnosis of hemangiopericytoma. After 1 year the patient came back with nasal obstruction and pain in the forehead. Open approach was used to remove tumor from the frontal sinus with bone lesion of the supraorbital fossa. The diagnosis was the same. **Conclusion:** Although the literature review support a more indolent course with low recurrence rates following complete endoscopic resection, our experience reports an aggressive tumoral behavior to hemangiopericytoma of the sinonasal tract.

**1508****A Rare Case of Leiomyosarcoma Arising from the Inferior Turbinate**Anna-Maria Papadopoulou¹, Anastasia Liapi¹¹*Department of Otorhinolaryngology, G.Gennimatas Athens General Hospital*

Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Leiomyosarcomas (LMS) are aggressive mesenchymal neoplasms with malignant smooth muscle differentiation. They comprise less than 7% of all soft tissue sarcomas and only 3 % affect the head and neck area. In this case report, we present a patient with sinonasal LMS and review the clinical, pathological and prognostic characteristics, as well as the available treatment strategies, contributing to the limited literature of this rare malignancy. A 60-year-old Caucasian female presented to the ENT department with a three-month-history of right-sided nasal obstruction and occasional bleeding. Nasendoscopy revealed a smooth, firm and well-circumscribed lesion in the caudal part of the right inferior turbinate obstructing the right choana. CT scan showed a soft tissue mass arising from the right inferior turbinate, without signs of bone erosion or extension into the paranasal sinuses. A wide excisional biopsy of the lesion was performed and the histopathology and immunochemistry analysis demonstrated sinonasal LMS. Despite negative margins of 1 cm, a radical resection of the entire inferior turbinate was decided, because of the high incidence of tumor local recurrence and persistence. The patient remains asymptomatic 18 months postoperatively. Sinonasal LMS is a rare entity which should be included in the differential diagnosis of sinonasal masses. The diagnosis is established by histopathology and immunochemistry. Wide surgical excision is the gold standard of treatment and long term follow up is mandatory due to its aggressive and infiltrative nature.



1510

A Rare Case of Sinonasal Lymphoepithelial Carcinoma

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Sinonasal lymphoepithelial carcinoma (SLEC) is an extremely rare malignant tumor of the sinonasal tract. In this case report, we present a case with locally advanced disease of the posterior ethmoid cells. A 75-year-old male presented with a 6-month-history of unilateral nasal congestion, recurrent epistaxis, aural fullness, diplopia and visual disturbance. Outpatient nasendoscopy was negative for abnormal findings, except for bulging of the posterior wall of the nasopharynx with no obvious mucosal changes. CT scan revealed an extensive osteolytic lesion of the right ethmoidal sinuses with invasion of the middle cranial and pterygoid fossae. There was also erosion of the right orbital floor. The patient underwent diagnostic endoscopic ethmoidectomy and biopsies. Histopathological examination of posterior ethmoid cell mucosa demonstrated undifferentiated malignant cells, associated with lymphoplasmacytic infiltration, while the immunohistochemistry was positive for pancytokeratin. A final diagnosis of EBV-positive SLEC was rendered and the patient was referred for concomitant chemo-radiotherapy. To our knowledge, this is the first case report of SLEC arising from the posterior ethmoid cells with invasion of the orbit and middle cranial fossa. SLEC should be differentiated from other sinonasal malignancies, such as lymphomas, nasopharyngeal and sinonasal undifferentiated carcinoma. Its prognosis remains favorable mainly because of its radiosensitivity. We recommend chemoradiotherapy for locally advanced disease and regular follow-up with CT scans.



1558

Sociodemographic and clinical characteristics of unilateral sinonasal tumors in Bogotá, Colombia

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Introduction: Sinonasal masses are common findings in the Otolaryngology consult. Up to 2.6-5% of head and neck tumors are sinonasal tumors. Unilateral sinonasal masses can be classified into benign or malignant. Differential diagnosis workup needs special attention given the overlapping clinical presentations. This study aimed to describe clinical, epidemiological and histopathological characteristics of patients with unilateral sinonasal tumors from the Otolaryngology department at two hospitals in Bogotá, Colombia. **Methods:** Records of patients with unilateral sinonasal tumor resection or biopsy over 5 years (2015-2020) were reviewed. Analyzed data included demographic variables, clinical and imaging characteristics of the tumors and surgical approaches. Statistical analysis was performed using STATA package version 14. **Results:** 163 patients were reviewed. Unilateral sinonasal masses were benign in 133 (82%) cases and malignant in 30 (18%) cases. Juvenile nasopharyngeal angiofibroma (18%) was the most common benign unilateral sinonasal mass. Older age was associated to malignancy ($p < 0.005$). Radiological symptoms and signs associated with malignancy were: facial pain, facial hypoesthesia, bone erosion and invasion of adjacent structures ($p < 0.005$). **Conclusions:** Factors associated with malignancy were advanced age, facial hypoesthesia, facial pain, and radiological signs such as bone erosion and invasion of adjacent structures. Further studies are required to determine risk factors associated to histopathological subtypes.



1566

Nasopharyngeal Carcinoma

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

ABSTRACT:BACKGROUND: Nasopharyngeal carcinoma (NPC) is a common neoplasm in certain ethnic groups, with highest incidence in southern China, Northern African and Southeast Asia. Genetic factors and Epstein-Barr virus (EBV) infection have a significant role in NPC oncogenesis. The majority of NPC patients are symptomatic only in advanced stages. **CASE PRESENTATION:** A 40-year-old woman presented to our outpatient department with a 3 month history of a right neck lump and parotid gland swelling, obstructive sleep apnea and otalgia one week after right molar extraction. EBV-VCA IgG and EBV-DNA tests were positive. Imaging tests demonstrated a nasopharyngeal neoplasm. The patient underwent endoscopic nasopharyngeal biopsy which showed a non-keratinizing carcinoma (WHO II). The disease treated with concurrent radiotherapy and chemotherapy. **Conclusions:** Nasopharyngeal carcinoma is rare in Europe and is commonly misdiagnosed in the early stages. Epstein-Barr virus (EBV) DNA is a useful marker for detection, monitoring, and prognostication of NPC.



1605

Effectiveness of nivolumab for sinonasal carcinomas

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Nivolumab, an anti-programmed death 1 (PD-1) monoclonal antibody, has been approved as the first immune checkpoint inhibitor in head and neck malignancies. The phase III trial, Checkmate 141 trial, does not include sinonasal carcinoma cases, and efficacy of nivolumab against sinonasal carcinomas is still unclear. We performed retrospective analysis of 39 cases of head and neck malignancies, including 7 sinonasal carcinomas, which were administered nivolumab at our institute between June 2017 to September 2020. Mean age were 67.3 (43 - 85) years old. 30 were male, and 9 were female. 30 were squamous cell carcinoma (SCC), 4 were malignant melanoma, and 5 were other histologies. Of those, 7 cases were sinonasal carcinomas including 2 SCCs, 2 malignant melanomas, and 3 others. Median duration of follow-up was 235 days. Median overall survival (OS) of all cases was 10.1 months. OS of sinonasal carcinomas and those of other primary sites were 7.29 months and 11.4 months ($p = 0.119$). Analysis excluding malignant melanoma had similar results. These results demonstrated effectiveness of nivolumab for sinonasal carcinoma resembles that of other head and neck carcinomas. Our results suggest that nivolumab is also effective for sinonasal carcinomas, although numbers of cases were limited.



1611

Preservation of the orbit in case of periorbital infiltration by sinonasal malignancies – the retrospective study

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Objective: One of the possible risks of sinonasal malignancies is its possible spread into orbit. The aim of the study was to demonstrate that a periorbital infiltration without involvement of deeper orbital tissues is not an indication criterion for a orbital exenteration. **Methods:** The retrospective analysis over a 14-year period of patients undergoing surgical treatment for the sinonasal malignancies with the histologically verified periorbital infiltration or deeper invasion into the orbit was performed. A total of 32 patients were included in the study. **Results:** The orbital preservation was performed in 18 patients and the orbital exenteration was performed in 14 patients. The 2-year and 5-year overall survival rate were respectively 61% and 43.8% for the orbital preservation group and respectively 50 % and 30.7 % for the orbital exenteration group. The vision in the orbital preservation group was graded as intact in 11 and functional with impairment in 3 patients. **Conclusion:** The orbital preservation in the case of the periorbital infiltration allowed the preservation of vision in the majority of patients and did not lead to worse survival compared to patients indicated for the orbital exenteration or compared to the results of other research groups.



1615

The surgical challenge behind the treatment of malignant nasal vestibule carcinomas – report of two cases

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Background & Aim: Basosquamous carcinoma (BSC) and squamous cell carcinoma (SCC) are cutaneous neoplasms with distinct incidences, both aggressive with an increased risk of recurrence and metastases. The first line of treatment is complete surgical excision with histopathological control of excision margins. In head and neck cancers, this requires multi-stage reconstruction and a multidisciplinary approach throughout the treatment period. We aim to present two cases of nasal vestibule BSC/SCC and their treatment. **Methods:** Consultation of the clinical records and iconography. **Results:** We present two cases of patients with a nasal mass with progressive growth whose biopsies revealed SCC. Despite different extents of the nasal lesions, both patients were submitted to partial rhinectomy and reconstruction of the defect with free flap and frontal extensor in a two-staged surgery. One of the patients underwent reconstruction of the nasal dorsum with costal cartilage. The histopathology showed a BSC and a SCC with free margins and no adverse features in each case with no need for further treatment. None of the patients showed signs of local recurrence or metastatic disease at 4-month follow-up. Reasonable aesthetic and functional results were achieved, and both remain under close surveillance. **Conclusions:** Although BSC and SCC are histologically different, complete surgical excision remains the best treatment choice. Aesthetic and functional outcomes are critical in these cases, and free flaps have considerably reduced the morbidity associated with surgical treatment.

1642

Nasopharyngeal carcinoma with multiple cranial nerve palsy: A case report

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Background: Cranial nerve (CN) involvement may occur as a complication in locally advanced nasopharyngeal carcinoma (NPC), representing a poor prognostic factor. Most frequently involved cranial nerves are the trigeminal, abducens, and hypoglossal nerves. Nevertheless, facial and vagus nerve palsies are particularly uncommon, with an incidence of 3% and 2%, respectively. **Methods:** Observational case report. **Results:** We report a case of a 52-year-old male who presented to the emergency department with a 6-month history of left-sided facial paralysis, proptosis, dysphonia, and dysphagia. Physical examination showed leftward tongue deviation and flexible endoscopy demonstrated a nasopharyngeal mass and left vocal cord palsy. Contrast-enhanced computed tomography imaging confirmed the presence of a large mass in the nasopharynx, with extension into the cavernous sinus, petrous temporal bone, temporal lobe, orbit, pterygopalatine fossa, masticatory muscle space and to the soft palate. Punch biopsy established the diagnosis of Epstein-Barr virus positive squamous cell carcinoma, and the patient was subjected to induction chemotherapy. **Conclusions:** NPC has a locally infiltrative behavior, with the potential for skull base invasion or intracranial spread. This case is illustrative of a rare and aggressive presentation of NPC, with an unusual combination of multiple CN palsies (CN VII, X and XII).



1643

Alveolar Rhabdomyosarcoma in the Paranasal Sinuses

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Introduction: Rhabdomyosarcoma is a rare soft tissue malignancy that arises from myogenic cells. The alveolar subtype is aggressive and infrequent in the paranasal sinuses and in the adult population, but it should be considered at the time of diagnosis. Myoglobin, Myo D1, and myogenin appear to be the most specific markers. **Materials and Methods:** The case of a patient diagnosed with Alveolar Rhabdomyosarcoma of the paranasal sinuses is presented. **Results:** A 49-year-old patient, operated on for Macroprolactinoma in 1995 + complementary radiotherapy, presented epistaxis, anosmia, right nasal obstruction and retroocular pain of months of evolution. MRI and CT: right nasal neoformation of approximately 6cm with extension to the anterior cranial fossa without invasion of brain or orbital tissue. A biopsy of the lesion and a positive immunohistochemical study were performed for Alveolar Rhabdomyosarcoma with rearrangement of the FKHR gene (FOXO1, 13q14) stage 3 (TNM classification), IRSG IIIa. She was treated with Vincristine-Dactinomycin-Cyclophosphamide with partial response, followed by weekly adriamycin plus complementary radiotherapy. After 1 year, she did not present signs of locoregional or distant recurrence. **Conclusion:** Immunohistochemical confirmation is the most important criterion to establish its diagnosis. Treatment involves surgery in localized cases and chemotherapy followed by complementary radiotherapy.



1647

Sinonasal olfactory neuroblastoma – case report

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Olfactory neuroblastoma or esthesioneuroblastoma is a rare malignant tumor that appears in approximately 3-5% of sinonasal neoplasms and arises from the olfactory nerve epithelium. The current treatment option includes surgical resection in association with radiotherapy. We report a case of a 34 years old patient who presented to our clinic for recurrent unilateral epistaxis. Computed tomography of the sinuses with intravenous contrast revealed a tumor with contrast enhancement located in the upper 2/3 of the left nasal fossa, invading the left olfactory fossa, eroding the cribriform plate, partial left frontal sinus and adjacent anterior ethmoid cells. The histopathological result was esthesioneuroblastoma (G4-). Carotid angiography showed that the vascularization of the tumor was provided by the left ophthalmic artery and the maxillary artery. Previous surgery was performed and after this procedure, an increased volume of the tumor appeared. The patient underwent surgical resection of the tumor through a combined approach (external and endoscopic). Postoperative, the patient was referred to the oncology department and is currently undergoing oncological treatment. It is known that esthesioneuroblastoma is more aggressive in younger patients and the prognosis is usually unfavorable. The 5-year overall survival rate ranges between 70-94%, depending on the Kadish stage. Particularly, this case presented a rapid growth of the tumor and it is interesting to follow up on the evolution.



1736

PRIMARY BURKITT'S LYMPHOMA IN THE MAXILLARY SINUS: A CASE REPORT

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 PAPADOPOULOU, ATHANASIA MARINOU, EVANGELIA ZACHARIOUDAKI, SOTIRIOS
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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Introduction Burkitt's lymphoma is a highly aggressive, small B-cell non-Hodgkin's lymphoma. The sporadic form of this high-grade lymphoma affects the Head and Neck region, usually involving cervical lymph nodes. Primary extranodal involvement, such as of the nasal cavity or the paranasal sinuses is highly uncommon. **Case presentation** A 38-years-old Caucasian male presented with progressively deteriorating facial pain of the left side, without any accompanying symptoms. His past medical history and physical examination were unremarkable, but the CT and MRI scan revealed a mass arising from the superior and lateral wall of the left maxillary sinus, eroding the posterior wall and surrounding the infraorbital nerve. Functional Endoscopic Sinus Surgery was performed and a biopsy of the lesion was taken. The histomorphological analysis of the excised tissue revealed a "starry-sky" appearance, characteristic of Burkitt's lymphoma, so the patient was referred to the Hematology department and was initiated on Chemotherapy and Radiotherapy. Two years after the end of the treatment, the patient remains free of disease. **Conclusion** This case highlights a rather unusual primary site of a Burkitt's lymphoma. In patients presenting with intense, unilateral symptoms and especially constant midfacial pain, a thorough diagnostic work-up should be performed, so as to achieve an early diagnosis of possible malignant causes.



1750

Maxillary lesions in children with acute leukemia

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Introduction: changes of the skull and facial bones in children with acute leukemia are commonly presented by lytic lesions. Leukemic infiltration of the maxilla or maxillary masses are very rare. Materials and methods: After 10 years of observation in pediatric tertiary care center of head and neck pathology, we included 6 cases of maxillary lesions in 5 (3 female and 2 male) pediatric patients with acute leukemia. Mean age was 7 years, min – 1 y.o., max – 14 y.o. 4 patients had acute lymphoblastic leukemia, one patient – acute myeloblastic leukemia. Main clinical manifestations: swelling in maxillary area – 83 %, nasal breathing difficulties – 50%, reactive edema of lower eyelid – 16%, unilateral otitis media with effusion – 16 %. None of the patients had fever, weakness, or tendency to excessive bleeding. All the patients had radiology confirmed presence of tumor site in maxilla. There has been orbital involvement and orbital growth in 2 cases, orbital and intracranial involvement in one case. Biopsy performed in all the cases. Lesions totally dissolved after on average 3 months of treatment of underlying disease.



1763

A rare case report of primary epithelioid hemangioendothelioma in the maxillary sinus

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Introduction: Epithelioid hemangioendothelioma (EHE) is a rare vascular soft tissue neoplasm. It is arising from the endothelial layer of blood vessels and it has variable clinical behavior. It can behave ranging from that of a low-grade malignancy to that of a high-grade sarcoma. Systemic involvement is not unusual. The most affected organs were liver, bone and lung. To date, there were only three cases reported in the literature in which EHE primarily arising from the paranasal sinus. **Case Summary:** A 85-years-old man presented to outpatient clinic with a history of left facial fullness. No other nasal symptoms were noted. On physical examination, no facial swelling and his nasal endoscopy examination is normal. Magnetic resonance imaging (MRI) was done and showed an extensive mass in the left maxillary sinus extending into the infratemporal fossa. The patient was ultimately diagnosed with epithelioid hemangioendothelioma (EHE) and underwent transnasal endoscopic tumour resection. He received adjuvant radiotherapy. He had regional cervical lymph node metastasis after a year which he underwent neck dissection. A year later he developed lung metastasis and he underwent thoracoscopic wedge resection successfully. Two years of close follow-up, he is well and tumour free clinically and radiographically. **Conclusion:** The treatment of choice for confirmed unifocal EHE is surgery. The key for treatment is complete surgical resection with clear microscopic margins. Post operative adjuvant radiotherapy is recommended.

1785

Orbital apex squamous cell carcinoma

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Background Orbital apex squamous cell carcinoma (SCC) is a rare entity. It often occurs from direct invasion from the nasopharynx, nasal cavity/paranasal sinuses, or secondary spread via a haematogenous route. We report a rare case of a patient diagnosed with a primary orbital apex SCC, on a background of nasopharyngeal carcinoma (NPC) in complete remission after curative chemoradiation. There are only five documented cases of primary orbital apex SCC documented in literature. **Case summary** A 68-year-old lady, with a history of NPC in 2003 in complete remission after curative chemoradiation, was referred to the Department of Otolaryngology in consideration for an endoscopic biopsy of a right orbital apex mass. She had presented to the eye clinic complaining of right eye proptosis and worsening vision. On examination, her right eye had no perception to light, right pupil was amaurotic, and there was restriction of extraocular movement in all directions of gaze. Hertel's ophthalmometer showed that there was proptosis and there was loss of corneal sensation in the right eye. Magnetic resonance imaging of the orbits revealed an enhancing right orbital apex mass with extension into the cavernous sinus. The patient underwent an endoscopic trans-sphenoidal biopsy of the right orbital apex lesion. Histopathology demonstrated SCC. Systemic workup did not reveal any other site of primary SCC nor metastasis. **Result.** She was managed with best supportive care as the tumour was deemed unresectable and she was also a poor candidate for chemotherapy and radiotherapy.

1788

Whole Exome Sequencing analysis for the investigation of malignant transformation mechanism in sinonasal inverted papilloma

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Poster Session | Sinonasal malignancy | 18 June – 22 June, 2023, All day

Sinonasal inverted papilloma (IP) has the potential to transform into squamous cell carcinoma (SqCC), but the mechanism is still uncertain and there is no diagnostic method to predict malignant transformation. We investigated genetic mutations involved in stepwise progression of sinonasal IP to SqCC and explored biomarkers that can predict malignant transformation. Fourteen patients diagnosed with SqCC arising from IP ("pre-malignant IP") and six patients diagnosed with "benign IP" were included. DNA was separately extracted from areas of normal tissue and area of IP, dysplasia, and SqCC, respectively. Whole exome sequencing and immunohistochemistry (IHC) was performed. Major oncogenic mutations were observed with high frequency in the stepwise progression from IP to SqCC. TP53 was the most frequently mutated gene (39%), followed by CDKN2A (27%), TTN (27%), PIK3CA (21%), and ARID1A (15%). Mutations in TP53 and/or CDKN2A were observed in three out of six pre-malignant IPs, whereas none of the mutations were observed in benign IPs. Tumor mutational burden increased from IP to SqCC. IHC staining of the benign IP group without genetic mutation showed all patchy positive for both p53 and p16. However, among the six IPs with malignant transformation, three IPs with genetic mutation showed a diffuse strong or null pattern in p53 and p16. Our result suggests that the assessment of TP53 and CDKN2A status can be a predictive marker of malignant transformation of IP. Furthermore, the assessment of p53 and p16 expression using IHC can be a surrogate marker for TP53 and CDKN2A status.



Skull base surgery

1666

Endoscopic endonasal transsphenoidal approach to sellar and parasellar lesions: An Institutional Experience

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Poster Session | Skull base surgery | 18 June – 22 June, 2023, All day

Introduction: The endoscopic transsphenoidal approach to the sella and parasellar regions is increasingly used for removal of lesions localized in the ventral skull base. The aim of this study is to report our experience regarding the surgical management of patients with sellar and parasellar lesions that presented in our tertiary care centre. **Material and Methods:** A retrospective study was performed for all cases of endoscopic transsphenoidal surgical management of sellar and parasellar lesions that were performed in the ENT Department of University Hospital of Larissa, Greece during the last decade. **Results:** A total of 16 patients were recruited in the study. The age of patients ranged from 30 to 79 years. Ten patients were female and six were male. The most frequent lesion was pituitary adenoma in 68.8%. Visual field and acuity deficit was the commonest symptom in 81.3%. Postoperatively, nasal adhesions were reported in 4 cases. In one patient, reoperation was needed due to cerebrospinal fluid leak. The patients were followed up for 1 to 7 years. **Conclusion:** Sellar and parasellar lesions represent a challenge because of their variable features. Endoscopic transsphenoidal approach offers enhanced visualization, resulting in successful removal of the tumor, along with lower complications' rate.

Smell and taste

1152

Efficacy of topical steroids for the treatment of olfactory disorders caused by COVID-19: A systematic review and meta-analysis

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Poster Session | Smell and taste | 18 June – 22 June, 2023, All day

This study was aimed to assess the effect of topical steroids on acute-onset olfactory dysfunction in patients infected with COVID-19. Patients infected with COVID-19. Main outcome measures: PubMed, Embase, the Web of Science, SCOPUS, Cochrane database, and Google Scholar were searched for articles. We analyzed studies comparing the improvement of olfactory dysfunction between topical steroid treatment and control groups (placebo or no treatment). In addition, we performed a subgroup analysis by study type. The improvement of olfactory score at 2 (standardized mean difference [SMD] = 0.7272, 95% confidence interval = [0.3851, 1.0692], p



1247

Rehabilitation of patients with a decrease in olfactive function after covid-19 infection.

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Poster Session | Smell and taste | 18 June – 22 June, 2023, All day

106 patients with post-covid syndrome (ICD - U09.9) (n=106) were observed for the period from January 2021 to December 2021. Statistical data processing was carried out in the Statistica 10.0 package. Olfactometry to determine the degree of smell reduction was performed according to the Voyachek method and included determining the degree of smell reduction with 4 standard solutions. Patients of the experimental group (n=86), NCVI therapy was combined with olfactory training course using various combinations of essential oils 5 times a day for 4 weeks. Patients in the control group (n=20) received standard therapy. Essential oil combinations for olfactory training were divided according to the combination of scents used. The olfactory training technique consists in regular stimulation of respiratory olfactory neurons with odorous substances. To assess the quality of life the generally accepted standardized questionnaire SNOT-22 was used. In the course of treatment of the experimental group, the sense of smell was completely restored in 52.97% of patients, which significantly differs from the control group, where this figure was 32.82%. In 9.30% of cases, patients who at the beginning of therapy had a fourth degree of decrease in olfactory function, after the end of the course, the third degree was diagnosed, the sense of smell improved and the patients began to distinguish the smell of pure wine alcohol. In 31.72% of cases, patients of the first group had the first degree of smell reduction.



1516

UP TO DATE IN SMELL AND TASTE DISORDERS

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Poster Session | Smell and taste | 18 June – 22 June, 2023, All day

Smell function is being studied for many years given its importance in our lives, but in the last three years, during the pandemics the number of papers regarding smell and taste has significantly increased. Incidence of smell and taste impairment varies between 5% and 95% and ¼ people with COVID-19 report smell and taste loss as the first symptom. It has been demonstrated that smell testing is as important as smell function assessment, because half of the patients accusing smell and taste loss have normal gustatory function. In what concerns the treatment of olfactory and taste disturbances, there are currently multiple options such as oral and intranasal corticosteroids, olfactory training, oral vitamin/mineral supplementation, amongst others. The majority (> 90%) of COVID-19 patients recover their smell and or taste 2 weeks after onset of the sensory dysfunction. Olfactory training is the only current evidence-based therapeutic option for post-viral olfactory loss.

1290

Effectiveness of olfactory rehabilitation in patients affected by post-viral olfactory disfunction after SARS-Cov2 infection

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Poster Session | Smell and taste | 18 June – 22 June, 2023, All day

Introduction: Olfactory dysfunction or "loss of smell" is an early symptom of COVID-19, with prevalence estimated between 40% and 75%. In Italy, about 33.9% of patients reported changes in taste and smell and 11% of subjects reported the alteration of both senses. Loss of smell often has a relevant impact on quality of life and overall health, directly affecting daily activities. There is evidence that olfactory training is effective in treating olfactory loss, improving regenerative ability and allowing proper survival and targeting of neurons during recovery. Other studies claim that the benefits of olfactory training may be similar to spontaneous recovery. The purpose of the study is to demonstrate the effectiveness of olfactory re-education in subjects suffering from chronic olfactory disorders (>6 months) post Covid infection. **Materials and methods:** we analyzed 60 patients (mean age 40,15 years ([18-60])) with chronic olfactory disorders (6 months) and confirmed history of Covid-19, negative nasal endoscopy and negative MRI. The exclusion criteria were: pregnancy, the presence of phantosmia or parosmia, cigarette smoke, rhinosinusitis in the six months preceding Covid infection, allergies, previous olfactory disorders, neurodegenerative disease, previous sinonasal surgery. Patients underwent a 24-week olfactory training, exposing themselves twice a day to 4 odors for 20 seconds with an essence change every 4 weeks, for a total of 9 essences. Patients were randomly divided into two groups of 30 subjects each: an Olfactory Training Group (OT), treated with essential oils at therapeutic concentrations, and a group Not Olfactory Training (NOT), treated with essential oils at subtherapeutic concentration. At the beginning and at the end of the training, all subjects performed the smell identification test (UPSIT). Results Mean UPSIT increased from 19.8 to 25.3 in the OT group, and from 19.6 to 21.9 in the NOT group. Considering an increase in the UPSIT score of 5.5 points as a clinically significant minimum difference for the improvement of olfactory function, our results show that 60% of the OT group and 34% of the NOT group have an improvement of olfactory function, with a statistically significant change in the OT group ($p < .05$).

Conclusions Olfactory training is effective in improving the olfactory threshold in people with chronic PVOD.



Snoring and OSA

1174

Surgical treatment of mild and moderate OSA

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Poster Session | Snoring and OSA | 18 June – 22 June, 2023, All day

In most cases decrease of soft palate muscle tone causes snoring and mild/moderate OSA. To solve this problem a soft palate stiffening surgery was introduced. The aim of the study was to improve the surgical treatment of mild and moderate OSA. Methodology. This study included 108 patients with mild and moderate OSA who underwent surgical treatment from 2015 to 2022. Three clinical groups were formed. Group I included 30 patients who underwent Pillar-procedure simultaneously with cold ablation of uvula and posterior arches. Group II consisted of 40 patients, in whom anterior palatoplasty was performed. Group III - 38 patients who underwent anterior palatoplasty alongside with cold ablation of uvula and posterior arches. Polysomnography, drug-induced sleep endoscopy and special questionnaires (visual analogue scale of snoring intensity (VAS), Epworth Sleepiness Scale (ESS)) were used to rule out more appropriate surgical strategy. Results. Postoperative pain was significantly lower ($p < 0,01$) in the group II. During the follow-up period of 1 year there was a significant reduction of VAS and ESS ($p < 0,01$) in group III. Apnoe/hypopnoe index decreased significantly ($p < 0,05$) in groups II and III. Conclusion. We recommend anterior palatoplasty with/or without cold ablation of uvula and posterior arches as an effective surgical treatment of mild and moderate OSA.

1147**Sleep time on back as a predictor of adherence to positive airway pressure therapy****Ha-Nee Kwon¹**, Ji-Hwan Park¹, Sung-Dong Kim¹, Kyu-Sup Cho¹¹*Department of Otorhinolaryngology and Biomedical Research Institute, Pusan National University School of Medicine, Pusan Natuion*

Poster Session | Snoring and OSA | 18 June – 22 June, 2023, All day

Objective: Although upper airway collapse can be effectively dealt with by positive airway pressure (PAP), patient adherence is considered a major determining factor for the success of PAP therapy. This study was performed to analyze the potential factors affecting adherence to PAP in patients with OSA by using polysomnography parameters recorded for diagnosis of OSA. **Methods:** The data of 158 patients between December 2018 and July 2021 were collected. They were categorized into adherent and non-adherent groups according to the criteria of good adherence as use of PAP ≥ 4 hours per night on 70% of nights. Demographic, clinical characteristics and PSG results were reviewed. **Results:** Among 158 patients engaged in PAP therapy, 121 patients (76.6%) met the criteria of good adherence. No significant differences were found in good adherence rates regarding demographic and clinical characteristics. None of the polysomnographic factors showed significant differences between adherent and non-adherent groups. However, the percentage of sleep time on back in the adherent group was significantly higher than in the non-adherent group ($p = 0.041$). **Conclusion:** Only the percentage of sleep time on back appeared to be a polysomnographic predictor for identifying good adherence to PAP therapy in OSA patients.

**1170****The relationship between metabolic syndrome and obstructive sleep apnea syndrome: a nationwide population-based study****Soo Whan Kim¹**

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Poster Session | Snoring and OSA | 18 June – 22 June, 2023, All day

There has been a need for research on the association between metabolic syndrome (MetS) and obstructive sleep apnea syndrome (OSAS) using large data such as nationwide population-based data that adjusts important confounding factors. Therefore, we investigated the relationship between MetS and OSAS. The data source we used was the National Health Insurance Service claims database managed by the Republic of Korea government, in which 10,113,560 individuals were enrolled in 2009 and followed up until 2018. The independent association of MetS with the risk of OSAS was determined using a Cox proportional hazards model with adjustment for age, sex, smoking status, alcohol consumption, regular physical exercise, and body mass index. Our results showed that MetS were strongly associated to OSAS which was adjusted for several confounding factors. Also, we found men, increased waist circumference and increased triglyceride are important risk factors for OSAS.

1176

Predictors of surgical outcomes for limited palatal muscle resection in patients with obstructive sleep apnea

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Poster Session | Snoring and OSA | 18 June – 22 June, 2023, All day

Objective This study aims to determine the factors affecting the success and cure rate of LPMR in patients with OSA, thus guiding patient selection and improving surgical outcome. **Methods** Thirty-five OSA patients underwent LPMR were enrolled. All patients received routine physical examination, preoperative DISE, and PSG. Clinical, polysomnographic, cephalometric variables, and DISE findings were evaluated. These measurements were compared between the surgical success and surgical failure group based on the results of preoperative and postoperative PSG. Furthermore, we compared the cured and non-cured groups in the surgical success group. **Results** Among 35 patients, a total of 20 patients met the success criteria, and the overall success rate was 57%. Patients with Friedman stage II had a significantly higher success rate ($p=0.032$). According to DISE results, tongue base obstruction affected the surgical outcome ($p<0.001$). The success rate was 100% in the no tongue base obstruction during DISE, 72.2% in the partial obstruction, and 9.1% in the total obstruction. Tonsil size is also helpful in predicting surgical success rate ($p=0.044$). However, none of the variables showed statistically significant differences between the cured and non-cured groups. **Conclusion** Calculating the Friedman stage and evaluating the tongue base degree through DISE helps predict the surgical effect before LPMR surgery. Patients with large tonsil size and no tongue base obstruction may have a high chance of surgical success with LPMR.



1258

Analysis of relationship between obstructive sleep apnea and non-alcoholic fatty liver disease using Korean NHIS-HealS data

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Poster Session | Snoring and OSA | 18 June – 22 June, 2023, All day

Currently, obstructive sleep apnea (OSA) is believed to be a disorder related to metabolic syndrome, however, the association between nonalcoholic fatty liver disease (NAFLD) and OSA has not yet been established. This study analyzed the relationship between NAFLD and OSA using data from the Korean National Health Insurance Service-National Health Screening (NHIS-HealS) data from January 2007 to December 2012. The study enrolled 80,139 patients with OSA and 365,080 control participants. NAFLD was defined as 1) a fatty liver index (FLI) ≥ 60 , 2) a hepatic steatosis index (HSI) ≥ 36 , or 3) clinically diagnosed as NAFLD (ICD-10 code K758 and K760). OSA was identified using claims data (ICD-10 code G473). In the study, 29.1% of the 80,139 patients had a FLI score of 30-60, 31.4% had a score over 60, 40.9% had a $30 \leq \text{HSI} < 60$, and 39.3% had a $\text{HSI} \geq 60$. In multivariate analysis, the risk of OSA was significantly higher in the higher FLI groups (HR 1.784, 95% confidence interval [CI] 1.757-1.812) and higher HSI groups (HR 1.781, 95% CI 1.754-1.808). This finding was consistent across age subgroups (young age 20-39, middle age 40-64, and old age ≥ 65). In conclusion, a high FLI or/and HSI score obtained from national health screening data may help identify patients with a high risk of OSA. Understanding the association between NAFLD and OSA may have important implications for the risk-stratification of patients with NAFLD.

1331

Frequency of upper respiratory obstructive disease in patients with sleep-disordered breathing

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Poster Session | Snoring and OSA | 18 June – 22 June, 2023, All day

Introduction For CPAP failure patients, the consultation of alternative treatments, including upper airway surgery is strongly recommended. In this study, we investigated the frequency of upper airway disease in patients with sleep-disorder who visited a sleep clinic. Methods 739 patients who visited the Ota Memorial Sleep Center between January 1 to December 31, in 2016 were included. Otolaryngologists performed upper airway examination using a nasopharyngolaryngoscope (evaluated degree 0 to 4), sinus CT scan, and rhinomanometry and acoustic rhinometry in the sitting and lying positions, as needed. Results and discussion In this study, 125/576 patients (21.7%) had hypertrophy of the palatine tonsils of degree 2 or more, 76/579 (13.1%) had nasal septal deviation degree 3 or greater, and 16/579 (3%) had hypertrophic rhinitis degree 3 or higher. 139/739 (18.8%) patients were diagnosed with chronic sinusitis, and 46/759 (6.1%) had nasal resistance of 0.35 pa/cm/ 3 sec or higher in the supine position. These are reported as the independent factors for CPAP intolerance. Therefore, after the diagnosis of OSA and prior to the start of conservative treatment such as CPAP, a detailed evaluation of the upper airway is necessary, and there are many cases in which otolaryngologists should intervene appropriately with their expertise.

1462

Modified barbed reposition pharyngoplasty(CWICKs) for OSA

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Poster Session | Snoring and OSA | 18 June – 22 June, 2023, All day

Objective: Uvulopalatopharyngoplasty (UPPP) is performed as a surgical treatment at the oropharyngeal level for obstructive sleep apnea, but there are problems with variations in treatment effects and postoperative complications. Therefore, effective and less invasive surgical methods are required. **Methods:** So-called CWICKs is one of modified methods of barbed reposition pharyngoplasty that use resorbable wound closure devices to pull the posterior palatal arch outward and elevate it anteriorly and superiorly to maintain an open upper airway during sleep at the soft palate level. We compared the therapeutic effects of 46 patients with CWICKs and 96 patients with UPPP. **Results:** In 46 patients with CWICKs, significant improvement was observed after surgery on AHI, %CT 90, ESS and PSQI. The improvement rate of AHI was 61.5%, and the surgical success rate was 58.7%. No postoperative complications such as dysphagia or scar stenosis were observed in CWICKs group. Compared with UPPP, there was no significant difference in the improvement rate of AHI, but significantly improved in AI, %stage 1 and %stage 3. **Conclusion:** The treatment outcome of CWICKs was equal to or better than that of the conventional UPPP. CWICKs are considered to be minimally invasive, simple, and effective surgical procedures for OSA.



1535

THE ROLE OF THE BERLIN QUESTIONNAIRE IN ASSESSING THE FREQUENCY OF OCCURRENCE OF OBSTRUCTIVE SLEEP APNEA SYNDROME IN PATIENTS WITH ASSOCIATED RISK FACTORS

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Poster Session | Snoring and OSA | 18 June – 22 June, 2023, All day

Sleep is a complex biological process. It is a reversible state of unconsciousness in which metabolism and motor activity are reduced. There are two different types of sleep: rapid eye movement (REM) sleep and non-REM (NREM) sleep. Sleep disorders are one of the most common clinical problems encountered. Inadequate or non-restorative sleep can interfere with normal physical, mental, social and emotional functioning. Sleep disorders can affect your overall health, safety and quality of life. In this retrospective study, we aimed to investigate patients with suspected obstructive sleep apnea syndrome based on the appropriate response of the Berlin Questionnaire. The total number of patients who met the study inclusion criteria was 77, each of whom completed the Berlin Questionnaire. The lot was then divided into two main groups according to the result obtained as follows: Gr.I (Low Risk), Gr.II (High Risk). The conclusion of this study was that the association of the suspicion of obstructive sleep apnea syndrome and comorbidities known as factors for the onset and progression of the syndrome.

1699

Nasal pathology in adult patients with obstructive sleep apnoea syndrome

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Poster Session | Snoring and OSA | 18 June – 22 June, 2023, All day

Introduction: Obstructive sleep apnoea (OSA) is a common sleep breathing disorder in which airflow is interrupted or significantly reduced during breathing effort. As the nose is the first anatomical structure of the upper airway, nasal pathology causing obstruction may contribute to sleep-disordered breathing. **Aim:** The aim of this study was to investigate the possible association of nasal pathology and symptoms with the presence and severity of OSA. **Materials and methods:** This was a prospective observational study involving patients who attended the Sleep Study Clinic of the University Hospital of Larissa and were diagnosed with moderate-severe obstructive sleep apnoea, following a full polysomnography. Apnoea/hypopnoea index, oxygen desaturation index, and Epworth Sleepiness Scale scores were assessed. Based on AHI scores, all study participants were divided into three categories of OSA severity: moderate, severe and very severe OSA. Patients evaluation included a complete otolaryngological examination and the use of questionnaires for allergic rhinitis screening (SFAR) and nasal breathing quality assessment (VAS Scale, SNOT-22 and NOSE). **Results:** Forty-three patients, aged 26-73 years old, participated in the study. The comparison of subgroups revealed a statistically significant difference in the body mass index and neck circumference, but not in nasal pathology and symptoms. **Conclusion:** Nasal pathology and associated symptoms do not seem to significantly affect OSA severity. Further research in larger patient samples is needed to draw definitive conclusions.

Technological advances

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ARTIFICIAL INTELLIGENCE IN MANAGEMENT OF NASAL TUMORS – REVIEW AND PERSPECTIVES

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Artificial intelligence (AI) applications in healthcare system is increasing. These “tools” are being explored and applied to help us diagnose, classify, predict, treat and manage different diseases. Although the AI software still has some challenges to overcome, the results obtained so far look promising [1]. Through the machine learning process, the AI could prove useful in the management of nasal tumors as it has been already applied both in imaging and pathological studies. Deep learning process has been used on MRI images to differentiate small round cell malignant tumors and non-small round cell malignant tumors in two studies. One used the T2 signal images and the apparent diffusion coefficient values and obtained 0.83 accuracy, 0.87 sensitivity, 0.78 specificity [2], and the other analyzed the textures of the T2-fat suppressed signal images, obtaining 0.89 accuracy, 0.88 sensitivity and 0.92 specificity. Could we increase the accuracy of the results on MRI images using an AI for automatic facial bone segmentation to make the software understand the exact position of the lesion? Bibliography:1. Martinez-Millana A, et al. Artificial intelligence and its impact on the domains of universal health coverage, health emergencies and health promotion: An overview of systematic reviews. *Int J Med Inform.* 2022 Oct;166:104855.2. Chen C, et al. Machine learning to differentiate small round cell malignant tumors and non-small round cell malignant tumors of the nasal and paranasal sinuses using apparent diffusion coefficient values. *Eur Radiol.* 2022 Jun; 32(6):3819-3829



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