

Sinonasal pathology and headaches*

Doğan Senocak¹ and Mustafa Senocak²

¹ Department of Otolaryngology, Cerrahpasa School of Medicine, Istanbul University, Istanbul, Turkey

² Department of Biostatistics and Medical Biology, Cerrahpasa School of Medicine, Istanbul University, Istanbul, Turkey

SUMMARY

Primary headaches or other chronic headaches can be triggered by sinonasal pathologies, or variations within the sinonasal tract. Establishing a cause and effect relationship between certain sinonasal conditions and chronic headaches can justify sinonasal surgery for the relief of headaches and provide considerable relief to a subgroup of patients with chronic headaches resistant to medical treatment. A prospective study on 204 patients undergoing sinonasal surgery for an apparent symptomatic sinonasal pathology was conducted to determine the incidence and types of headaches in sinonasal patients preoperatively, the presence of potential sinonasal triggering mechanisms, and postoperative headache relief when such triggers are removed. The relationship between potential triggers and postoperative relief is analysed to determine a possible link. Headache was a major complaint in 50% of these patients and the overall incidence of primary type headaches was 25.5% (52 of 204 patients). Postoperatively, 83.4% of the patients expressed improvement of the headaches (85/102). High scores of preoperative Sinonasal Headache Quotient (SNHQ), obtained through a general questionnaire and endoscopic/radiologic work up seems to correlate well with postoperative relief of headaches ($p < 0.0001$), as well as a well defined lesion site and an ipsilateral pain localization ($p < 0.02$). A detailed sinonasal analysis of chronic headache patients may help identify a subgroup with potential sinonasal triggers and these patients may experience considerable relief of headache following surgery.

Key words: sinonasal headache, rhinopathy, nasal contact points

INTRODUCTION

Headache is present as a primary complaint in an estimated 1% of all patient visits (Seiden, 1996). The International Headache Society (IHS) classification lists 13 major types of headaches (Headache Classification Committee, 1988). Most of the diagnosis made for chronic headaches fall into a group termed primary headaches which are Migraine, Tension Type Headache (TTH) and Cluster Headache and exclude an identifiable etiology by definition. The diagnosis depends on a typical clinical presentation in most of the cases, and the complex underlying physiopathologic events leading to the clinical presentation are not well understood (Clerico, 1996a). This perhaps is responsible for the limited efficacy of present treatment options for the majority of patients diagnosed with primary headaches. A multitude of possible triggers of primary headaches have been suggested, avoidance or treatment of which could potentially prove beneficial for the patients.

The International Headache Society classification lists headaches arising from the nose and paranasal sinuses along

with those arising from "cranium, neck, eyes, ears, teeth and other facial and cranial structures". Eventhough pain arising from acute conditions of the sinonasal tract is easy to diagnose and is expected to disappear once the primary condition is cured, the relationship of sinonasal pathologies with chronic pain or headaches, especially of the "primary" type, is not well understood. It is generally accepted that sinonasal pathologies, with the possible exception of isolated posterior sinusitis, are not responsible for chronic headaches. IHS states that "chronic sinusitis is not responsible for headaches unless there is an acute exacerbation" (Headache Classification Committee, 1988). Eventhough a number of reports describing patients diagnosed with primary headaches refractive to medical treatment, where treatment of various sinonasal conditions have led to considerable relief of the headache problem exist, sinonasal surgery with the primary intent of headache relief does not seem justified at the moment. Being able to identify a sinonasal condition as the causative factor in a primary headache patient, or any patient with a chronic form of

*Received for publication: June 23, 2003; accepted: November 7, 2003

headache is a challenging task and requires accurate understanding and addressing of certain issues.

1. Sinonasal pathologies, or variations of the sinonasal anatomy thought to be responsible for headaches are present in a large group of normals or patients who do not experience any headaches at all.
2. Most patients with primary or other chronic headaches do not exhibit one type of headache only. They will frequently identify one type preceding and perhaps triggering the other, as well as other triggers such as ingestion of certain foods, stress etc. These patients are possibly "prone" to headaches much more so than the average person, which may suggest why and how sinonasal conditions can also act as triggers.
3. A certain subgroup of patients will describe typical sinonasal symptoms preceding headaches, however rhinologic exams and radiologic work up do not necessarily detect a pathology in all of these patients even though a sinonasal trigger seems to be clinically evident.
4. Some of these patients "prone" to headaches with sinonasal problems will have complete resolution of the pain once the sinonasal problem is treated while some will not experience any difference at all.
5. If sinonasal surgery can provide relief from a primary type headache, the definition of "primary" headaches will need to be reconsidered, including certain etiologic criteria in the definition, and justifying a complete sinonasal work up in all of these patients.

The challenge is to accurately identify those patients who exhibit potential signs and symptoms of sinonasal triggering mechanisms for their headaches, as well as identifying those sinonasal conditions that have the potential to be such triggers. Once this relationship is well identified, the correct subgroup of chronic headache patients with unsatisfactory response to medical treatment can find considerable relief and some of the issues mentioned above can be resolved.

Many conditions of the sinonasal tract have been proposed as potential triggers of chronic headaches since the times of Hippocrates. With the development of endoscopic and radiologic evaluation, previously unrecognized conditions have also been included in a long list of potential triggers. Septal deviations, septal spurs, turbinate hypertrophy, contact points within the nasal cavity, concha bullosa, large ethmoid bulla, pneumatized superior turbinate, isolated infections of especially the posterior sinus groups have all been suggested (Chow, 1994; Clerico and Fieldman, 1994; Clerico, 1996a; Clerico, 1996b). Since these conditions can also be present in patients with no headaches or even no sinonasal symptoms, the question of when they should be addressed for headache relief needs to be made on an individualised basis. Analysis of patients undergoing surgical treatment for an apparent symptomatic sinonasal pathology for the presence of preoperative headache history,

and postoperative evaluation can provide invaluable information on such a cause and effect relationship.

PATIENTS AND METHODS

Two hundred four patients diagnosed with chronic nasal obstruction due to septal or turbinate problems, nasal polypsis and/or rhinosinusitis not responsive to medical treatment, who were operated on by the author between 1994 - 2002, were included in the study. The patients were preoperatively asked about the presence, severity and types of headaches they experience. Hundred two patients (50%) considered headache an important factor affecting the quality of their lives. Pertinent information on sex distribution, surgical indications and headaches can be seen in Table 1. Patients were asked to score their headaches on a range of 1 to 3 (Table 1). Headache types were defined according to the International Headache Society guidelines (Figure 1).

All patients underwent nasal endoscopy using a 3.0 mm rigid endoscope or a 2.4 mm flexible nasolaryngoscope. Coronal plan computerized tomographies (CT) were also obtained for all patients. Potential sinonasal triggers of headaches detected on radiologic and endoscopic examination were noted for all patients. Ipsilaterality of headaches and detected sinonasal pathologies or variations were also noted (location vs. lesion). Table 2 lists such potential anatomical triggers found in the patients with and without headaches.

Depending on the sinonasal symptomatology and endoscopic/radiologic findings, patients with headaches were given a preoperative Sinonasal Headache Score (SNHQ) (Figure 2). Such a scoring system has not been defined previously and aims to identify the presence of sinonasal triggering factors for patients susceptible to headaches. Higher scores were expected to suggest a higher possibility of sinonasal triggering mechanisms and thus a better chance of postoperative headache relief.

M. Migraine or variant. Unilateral, throbbing in quality, with prodrome and/or aura, nausea and vomiting, abdominal cramping, family history.

C. Cluster headache. Severe, unilateral, orbital, periorbital or temporal pain with nasal congestion, rhinorrhea, lacrimation, conjunctival injection, myosis, ptosis or eyelid edema.

T. Tension type headache. Pressing, tightening type of pain, no throbbing, may last up to seven days, physical activity will not worsen the condition, no nausea or vomiting.

Non Primary. Pain that cannot be typed as any one of the primary types with regards to location or accompanying symptoms.

Figure 1. Primary headaches. Adapted from the International Headache Society guidelines.

Table 1. Preoperative headaches/surgical indications.

| Patients n=204 male:100, female:104 Age:40.12±12.7 | Headaches-1^o n=36 m:13,f:23 migraine:13,cluster:8, TTH:15 | Headaches-2^o n=46 m:28,f:18 migraine:2,TTH:13 not primary:30 | Headaches-3^o n=20 m:9,f:11 not primary:20 | No Headaches n=102 m:55,f:47 |
|--|--|---|---|--|
| Nasal Airway Obstruction | 17 m4,f:13 | 12 m9,f:3 | 4 m:3,f:1 | 28 m:19,f:9 |
| Sinusitis | 9 m:6,f:3 | 28 m:14,f:14 | 10 m:5,f:5 | 22 m:11,f:8 |
| Nasal Airway Obstruction and Sinusitis | 9 m:3,f:6 | 6 m:5,f:1 | 6 m:1,f:5 | 49 m18,f:31 |
| Osteoma | 1 ,f | 0 | 0 | 3 |

1^o. Very severe and/or frequent (more than twice a week), debilitating, affects daily activities even with medication.

2^o. Less severe, will respond to medication soon enough to go on with daily activities, once a week or less.

3^o. Does not affect daily activities even without medication, less than once every other week.

Table 2. Potential sinonasal triggers and presence of headaches.

| Potential Triggers* 98/204 (53.9%) | Patients with Headaches and potential triggers 65/102 (63.7%) | Patients without Headaches and potential triggers 33/102 (32.3%) |
|---|--|---|
| Septal Spurs-IT ¹ | 11 | 6 |
| Septal Spur-MT ² | 8 | 3 |
| Septum-MT | 8 | 14 |
| Concha Bullosa | 27 | 6 |
| Bulla Ethmoidalis-MT | 9 | 8 |
| Superior Turbinate ³ | 4 | 0 |
| Osteomas | 1 | 3 |
| Infections ⁴ | 27/48 | 11/22 |

* Nasal polyposis, mucosal hypertrophy of the turbinates are not considered potential triggers. Patients can have more than 1 potential trigger. There are 95 potential triggers in 65 patients with headaches and 51 potential triggers in 33 patients without headaches.

¹ IT: Inferior turbinate. Septal spurs penetrating bony turbinate .

² MT: Middle turbinate. Contacts between MT, septal spurs, septum or bulla ethmoidalis are potential triggers.

³ Pneumatized superior turbinates, or superior turbinates contacting the nasal septum.

⁴ Not all infectious foci such as mucosal thickening, acute infections with an air-fluid level draining into the nasal cavity are considered potential triggers. All posterior sinus infections, cysts and completely opacified sinuses/cells are considered potential triggers.

Table 3. Distribution of types of headaches among surgical indications.

| | Migraine | TTH | Cluster | Mixed¹ | Non Primary² |
|---------------------------------|-----------------|------------|----------------|--------------------------|--------------------------------|
| Nasal airway obstruction(NO) | 3 | 6 | 3 | 11 | 13 |
| Sinusitis | 2 | 3 | | 19 | 23 |
| NO and sinusitis | | 1 | 1 | 2 | 14 |
| Osteoma | 1 | | | | |

¹ Not all patients describe "pure" headaches of one type only. There were 15 patients with typical migraine episodes but 9 of them also had other types of headaches, 29 patients with TTH, 19 of them with other types as well, and 8 patients with Cluster headaches, 4 with other types.

² Non-primary defines headaches that can't be typified as one of the three primary types of headaches; migraine, TTH, cluster.

| |
|--|
| <p>1. Patient complaints (Sinonasal questionnaire) (1 point each).</p> <p>Nasal obstruction Nasal discharge Postnasal drip Nighttime cough Prolonged or frequent nasal infections Throat clearing Facial/forehead pressure Barometric changes provoking headaches Increased nasal symptoms prior to or during headaches Presence of nasal allergies</p> <p>2. Endoscopic/Radiologic</p> <p>Mucosal contact points; Septal spurs penetrating the tissue on the lateral nasal wall, Concha bullosa, Paradoxal middle turbinate, Bulla ethmoidalis or Pneumatized superior turbinate where the mucosa and the underlying skeletal tissue is at contact with an opposing such area (2 points each).</p> <p>Infections of the sinonasal tract; Intranasal purulent discharge, or asymptomatic sinus infections as determined by radiology. Isolated sinusitis: effecting one sinus group only, Anterior sinusitis, Posterior sinusitis or pansinusitis, with or without polyps (2 points).</p> <p>Polyps or mucosal hypertrophy of the inferior turbinates are not registered as mucosal contact points. For isolated sphenoiditis along with tension type headaches or isolated frontal sinusitis with orbital, periorbital pain, or well lodged osteomas (3 points).</p> <p>Provoked/Aborted pain, typical headache induced by endoscopic exam, immediately or the day of examination; or pain aborted by application of a topical anesthetic strongly suggests a sinonasal trigger (5 points).</p> <p>Location. For any sinonasal condition coinciding with the side of pain as described by the patient (2 points).</p> |
|--|

Figure 2. Parameters for potential sinonasal causes of chronic headaches: sinonasal headache quotient (SNHQ).

| |
|--|
| <p>Complete relief: No headaches at all, headache is a negligible complaint.</p> <p>Some relief/Improvement: The frequency, duration or severity of headaches is less then they were preoperatively, though headaches are still present.</p> <p>No relief: There is no postoperative change in headaches.</p> <p>Worse: Some or all components of headaches are worse.</p> |
|--|

Figure 3. Postoperative headache evaluation.

All patients were reevaluated on the postoperative 2nd month with reference to headaches. Postoperative headache scores were compared with preoperative scores and surgical benefit was assessed (Figure 3).

Statistical Analysis

Postoperative outcome with reference to headaches and preoperative data on sex, type of headache, severity of headache, location vs. lesion, surgical indication, nasal polyposis, SNHQ, contact points within the nasal cavity, presence of purulence or polyps and provoked pain were compared using the Chi-square test. For analysis of these relationships, Pearson correlation coefficients were computed and tested for statistical significance. Statistical significance was set at $p < 0.05$. Variables with statistical importance were then analysed using logistic regression to determine the odds ratio for postoperative relief expectancy.

RESULTS

Two hundred four patients were initially evaluated for the presence of headache. Fifty percent of the patients considered headache an important symptom. These patients represent the core of the study since postoperative relief of headache was considered to be the single most important indicator of a sinonasal trigger of pain. Of the 102 patients with headaches, 35.3% had severe headaches (36/102), 45.1% had moderate pain (46/102) and 19.6% had what they considered mild headaches. Fiftyone percent of the headache patients described one of the primary types of headaches as the typical pain, alone or with other types of headaches. Tension type headache (TTH) was the most common of these. Table 3 lists data on the types of headaches.

Postoperative evaluation on the 2nd month with reference to headaches revealed that 32 patients had complete relief from headaches (31.4%), 53 had some relief (52%), whereas 16 (15.7%) had no relief at all and 1 patient actually had worsening of his symptoms. Headache relief and various parameters were then analysed for statistical significance.

The type or the severity of preoperative headaches did not effect postoperative outcome. Patient sex did not effect the presence of headaches or postoperative relief either.

Surgical indications were grouped under

1. Nasal airway obstruction (32.7%),
2. Rhinosinusitis (47.6%),
3. Airway obstruction and rhinosinusitis (20.9%)
4. Osteomas (1%).

Distribution of surgical indications can be seen in Tables 1 and 3. Surgical indication did not affect outcome with reference to headache relief. Thirtyeight patients had rhinosinusitis limited to the anterior sinuses, 12 (14.4%) had isolated posterior sinusitis and 18 (16.6%) had inflammation affecting all the sinus groups. Location of the inflammation did not seem to effect the outcome either. Presence of purulence in the nasal cavity and postoperative headache relief also did not correlate well. Concha bullosa was the most common variation encountered in the sinonasal cavity. Twentyseven of the 102 patients had concha bullosa, 6 of the cases were bilateral. Though this is a

Table 4. Statistically significant findings of the study: relief vs. triggers.

| | Relief of Headaches 85/102(83.4%) Complete:32(31.4%) Some relief/ improvement:53(52%) | No relief No relief: 16(15.7%) Worse:1(1%) | Chi-Square | p | Odds ratio |
|----------------------|---|---|------------|---------|------------|
| Location vs lesion + | 51 | 5 | 5,35342 | 0,02068 | 4,0392 |
| Location vs lesion - | 34 | 12 | | | |
| SNHQ <10 | 15 | 10 | 13,43311 | 0,00121 | 0,2492 |
| SNHQ 10-15 | 38 | 5 | | | |
| SNHQ >15 | 32 | 2 | | | 1,558 |

The presence of location vs. lesion and a high SNHQ were the only findings suggesting a favorable surgical outcome with reference to headache relief. A low SNHQ suggested a lower expectancy for postoperative headache relief.

higher occurrence than the reported 15% incidence of concha bullosa, it did not effect the presence or postoperative relief expectancy. Sixtythree patients had contact points between two opposing walls of the sinonasal tract (61.8%). The presence or the level of contact, i.e. at the level of the inferior, middle, or superior turbinates did not seem to effect the outcome. Presence of a contact point or an inflammatory focus coinciding with the distribution of headache (location vs lesion) correlated well with postoperative headache relief ($p < 0.02$). Postoperative headache relief expectancy was 4 times more for these patients than those who did not have matching lesion and pain locations.

The patients were divided into 3 groups based on their SNHQ scores. Scores of less then 10, 10-15 and more then 15 were analysed seperately to see if there was a significant difference in outcome. Bivariate analysis of SNHQ scores against postoperative headache relief suggests a strong link between high scores and postoperative relief ($p < 0,00121$). The odds ratio for postoperative relief was much smaller for patients with a low score of 10 or less (0.2457).

Table 4 lists the statistically significant variables of the study.

DISCUSSION

Patients with chronic headaches are usually evaluated by a variety of different specialists. An internist or a neurologist is usually the first specialist to diagnose such a patient with a "primary" headache if the clinical presentation is typical. As mentioned earlier, diagnosis of Migraine, Cluster Headaches or TTH are based purely on clinical presentation and most patients with chronic headaches (90%) will describe one of them or a combination of these (Headache Classification Committee, 1988). The criteria for clinical diagnosis is outlined by the International Headache Society statement, the most recent one dating back to 1988. Once the diagnosis is established, the next step is usually a trial of different medical treatment options, until and if one that is effective enough is encountered. There seems to be a disparity between the approach employed by the IHS and the experience of most

otolaryngologists as far as chronic headaches are concerned however (Blumenthal, 2001). Most of us have had experiences with patients presenting with typical primary headaches and sinonasal problems, the treatment of which also had a considerable impact on headache relief. There are many published reports of such cases (Chow, 1994; Clerico and Fieldman, 1994; Clerico, 1996a; Clerico, 1996b). Since the pathophysiological events leading to the typical presentation of primary headache syndromes are not well understood, it is perhaps not possible to explain the process through which sinonasal problems may trigger such headaches either. Recently, Cady et al. (2002) have reported a study on a convergence hypothesis for primary headaches where they refer to an escalating process of pain gradually leading to tension type headaches and migraine. Sinonasal problems may be responsible for triggering such a process as well as any other source of chronic inflammation within the head and neck region. Clerico (1996a) has described in detail the process that he refers to as "neurogenic inflammation" and its potential role as a trigger in primary headaches. A neuromediator termed Substance P (SP) seems to be responsible for the trigger of pain and accompanying symptoms in these cases. This process could trigger the vasospasm leading to the typical clinical presentation of migraine and/or cluster headaches.

Headache is an obvious symptom in most sinonasal patients. Studies refer to a 64-82% presence of chronic headache in patients with chronic sinonasal problems. Postoperative relief from headaches for such patients is also reported at around 80% (Damm et al., 2002). There are also reports of patients presenting with primary type headaches and sinonasal conditions detected radiologically which are otherwise not symptomatic at all, some of which are variants of normal anatomy (Kenny et al., 2001; Mudgil., 2002). Unless a large number of patients with primary headaches are analysed routinely for such conditions, we may never get an accurate answer for questions such as:

1. Which potential triggers should be sought within the sinonasal cavity in such cases, and
2. What should be done

once they are encountered? Should we, for example, suggest surgery for all patients with migraine and a large concha bullosa, (how) do we know it is going to be beneficial for the patient.

This present study was a prospective study on patients with obvious sinonasal pathologies with an apparent surgical indication. As there is not enough evidence to suggest surgery for chronic headaches when an obvious sinonasal pathology is not present, the data obtained from these patients was analysed to identify potential conditions which may act as triggers in the headache "prone" patient. Being "prone" to chronic headaches seems to be a personal trait, and obviously such triggers are significant only for such patients. An analysis of potential triggers in the non-headache group of patients was therefore not carried out. Of the 204 patients included in the study, 102 (50%) considered headache an important symptom. A Sinonasal Headache Score was obtained for all patients with the aim of testing our ability to determine those patients who will benefit from surgery preoperatively. Symptoms or signs which are suggestive of sinusitis or any predisposing conditions were included in the questionnaire. Conditions like isolated posterior sinusitis, osteomas or bony contact points were also given special attention. Most researchers suggest bony contact points as potential triggers of primary headaches, and there are reports of isolated posterior sinus infections, especially sphenoiditis presenting with migraine like headaches (Clerico et al., 1997; Ng and Butler, 2001). Varying degrees of headache relief following sinonasal surgery in these patients is reported. Some articles mention very high success rates. Chow (1994) reports a 83% postoperative relief of headaches if the area of contact either triggers the headache when palpated, or if there is headache relief when anesthetised. He identifies nasal septal spurs as the triggering factor in 12 of 18 patients (Chow, 1994). Clerico (1996a) also has extensively studied and reported on mucosal contact points, the process of neurogenic inflammation and potential triggers within the sinonasal tract. He suggested the term "Rhinopathic Headaches" for such primary headaches triggered by problems within the sinonasal tract (Clerico, 1996b). Our analysis failed to reveal a correlation between contact points within the sinonasal cavity and headaches. Patients with contact points were divided into 3 major groups depending on the level of contact, i.e., inferior, middle or superior turbinate levels, none of which proved to have any significant correlation with headaches. There also seems to be no statistical relationship between the presence of nasal purulence or nasal polyposis and headache relief after surgery. This finding is in agreement with the notion that polypoid tissue or tissues with high levels of inflammation lack the SP concentrations necessary to trigger pain. Stammberger and Wolf (1988) have measured levels of SP in various inflammatory stages of sinonasal mucosa. Their study reveals that the amount of SP within the mucosa is inversely proportional to the level of inflammation. Polypoid tissue contains very

minute or undetectable amounts of SP whereas normal mucosa has the highest levels.

Typical headache triggered by endoscopic exam, or aborted by the application of a topical anesthetic agent during endoscopy seems to be an important predictive data on postoperative relief according to some researchers. Only 4 of our patients actually had headaches during endoscopic examination. Three of these patients did experience headache relief from topical application of lidocaine, and had complete headache relief postoperatively. However due to the small number of patients this information is statistically not significant.

One of the most significant findings of this study was in reference to the relationship between the location of the pain and endoscopic or radiologic findings which were considered abnormal or variant. Even though this finding does not seem to be in agreement with various studies which suggest a lack of correlation between sinonasal symptoms and CT findings (Kenny et al., 2001; West and Jones, 2001; Mudgil et al., 2002), it should make sense for referred pain, or "neurogenic inflammation" to be an ipsilateral process. We feel that the evaluation of chronic headache patients with a typical consistent location, especially in the distribution area of Trigeminal branches should involve a complete sinonasal examination.

Postoperative follow up period can be considered one of the shortcomings of this study. Patients were followed up closely in the immediate postoperative period as routine postoperative care is necessary in all these patients. On the postoperative 8th-10th week, they were asked to return for headache evaluation, at which time they were asked to score their headaches. Since criteria for preoperative presence of headaches included a minimum of biweekly episodes, an 8 to 10 weeks of headache history should be considered sufficient. Patients whose headaches recurred probably chose to seek help from their neurologists or other specialists since the sinonasal procedure was not presented as a means of curing their headaches. We think, however, that even a short term headache relief following sinonasal surgery suggests that sinonasal tract work up in headache patients is justified.

This study clearly demonstrates the complexity of understanding the relationship between chronic headaches and potential sinonasal triggers. There does not seem to be one single condition that can act as a trigger alone. It is therefore important to evaluate the sinonasal tract as a whole with potential symptoms and signs of chronic or recurrent sinusitis, or any condition predisposing to mucosal inflammation such as allergies and contact points which may eventually predispose rhinosinusitis. This is evident in the finding that eventhough most of the parameters that are included in the study are not individually significant, an overall evaluation of the sinonasal tract, defined by the SNHQ score in our study, seems to correlate well with postoperative headache relief. Results show that despite the lack of a clear understanding of the pathophysiology

gy of sinonasal triggering mechanisms, a subgroup of patients diagnosed with primary headaches will benefit from surgery if a detailed rhinologic work up is suggestive. Our aim should be to inform other healthcare professionals who treat headache patients for the presence of such potential conditions.

CONCLUSION

Headache seems to be a frequent complaint of patients with apparent sinonasal pathologies. Clinically headache triggered by sinonasal pathologies can mimic or actually present as primary headaches. A certain subgroup of patients diagnosed with primary headaches with occult or undiagnosed sinonasal pathologies will benefit from treatment of these conditions. A complete sinonasal examination with a detailed questionnaire will help identify these patients. Surgery for mucosal contact without suggestive symptomatology and findings does not seem to be justified for the treatment of headaches with the present results. A well matched pain and lesion localization is a favorable indication of postoperative relief of headache however and should be considered prior to surgery. Patients with sinonasal symptoms and findings and chronic headaches have a 85% chance of postoperative improvement of headache symptomatology.

REFERENCES

1. Bluementhal HJ (2001) Headaches and sinus disease. *Headache* 41: 883-888.
2. Cady R, Schreiber C, Farmer K (2002) Primary Headaches: a convergence hypothesis. *Headache* 42: 204-216.
3. Chow JM (1994) Rhinologic Headaches. *Otolaryngol Head Neck Surg* 111: 211-218.
4. Clerico DM (1996) Pneumatized superior turbinate as a cause of referred migraine headache. *Laryngoscope* 106: 874-879.
5. Clerico DM (1996) Rhinopathic Headaches. In: ME Gershwin and GA Incuado (Eds) *Diseases of the Sinuses*. Totowa, NJ. Humana Press Inc. 403-423.
6. Clerico DM, Evan K, Montgomery L (1997) Endoscopic sinonasal surgery in the management of primary headaches. *Rhinology* 35: 98-102.
7. Clerico DM, Fieldman R (1994) Referred headache of rhinogenic origin in the absence of sinusitis. *Headache* 34: 226-229.
8. Damm M, Quante G, Jungehuelsing Mstennert E (2002) Impact of functional endoscopic surgery on symptoms and quality of life in chronic rhinosinusitis. *Laryngoscope* 112: 310-315.
9. Headache Classification Comitee of the International Headache Society (1988) Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain. *Cephalgia* 8 (suppl.7): 19-36.
10. Kenny TJ, Duncavage J, Bracikowski J (2001) Prospective analysis of sinus symptoms and correlation with paranasal computed tomography scan. *Otolaryngol Head Neck Surg* 125: 40-43.
11. Mudgil SP, Wise SW, Hopper KD (2002) Correlation between presumed sinusitis induced pain and paranasal sinus computed tomographic findings. *Ann Allergy Asthma Immunol* 88: 223-226.
12. Ng YT, Butler J (2001) Sphenoid sinusitis masquerading as migraine headaches in children. *J Child Neurol* 16: 882-884.
13. Seiden AM (1996) Otolaryngologic evaluation and management of headache. *Curr Opin Otolaryngol Head Neck Surg* 4: 205-211.
14. Stammberger H, Wolf G (1988) Headaches and sinus disease: the endoscopic approach. *Ann Otol Rhinol Laringol* 97 (Suppl.134): 3-23.
15. West B, Jones NS (2001) Endoscopy-negative, computed tomography-negative facial pain in a nasal clinic. *Laryngoscope* 111: 581-586.

Dr. Dogan Senocak

B. Mehmet Pasa Sok 4/4 Guliz apt.
Camlik, Istanbul, Turkey

Tel: +90-532-321-6402

Fax: +90-212-263-1388

E-mail: dsenocak@superonline.com

FELLOWSHIP

Calling all rhinologists

All those with an interest in this area will already be aware of the Rhinostanbul - the 20th Congress of the European Rhinologic Society and 23rd International Symposium on Infection and Allergy of the Nose, which will be held between June 18th -23rd 2004 in Istanbul, Turkey. The journal is offering 3 Fellowships to a maximum of 1,500 Euros to allow young researchers or clinicians to attend this ERS/ISIAN Congress. Candidates must be under 35 years of age and the closing date is June 1st 2004. The application letter should include a curriculum vitae, a travel plan and a letter of recommendation from a referee. The Editors of '*Rhinology*' Bert Huizing, Wytse Fokkens and myself, Valerie Lund, very much hope that many of you with an interest in this area will apply.

Please send 3 copies of the application to:

'Rhinology'

The Editor's Office:

Department of Otorhinolaryngology

University Hospital Utrecht, P. O. Box 85.500

NL-3508 GA Utrecht, The Netherlands