SURGERY OF THE NOSE AND PARANASAL SINUSES IN ALLERGIC DISEASES

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Before referring to the indications and contra-indications as regards surgical intervention in the various allergic conditions which fall within the category of rhinological diseases, I should first like to make a few general remarks on surgical therapy as applied to tissues affected by an allergic disorder.

An operation on mucosal membranes in which an acute allergic reaction has developed always entails the risk that the condition may become aggravated (**Gorelik, Hansel, Sanders, Taillens, Weille** and **Richards,** etc.). Damage to the mucosa of the shocked organ facilitates penetration by allergens, which in turn may lead to renewed sensitisation or, in other words, to an intensification of the antigen-antibody reaction (A.A.R.).

The trauma inflicted at operation may also cause a latent allergy, affecting the upper respiratory passages to become manifest and thus precipitate an acute allergic attack (**Donald**).

These two hazards are in themselves sufficient to warrant the conclusion that, in cases where a respiratory allergy is known or suspected to be involved, surgical intervention as a general rule should only be undertaken with the utmost caution and restraint (**Dean, Hansel, Hill, Sanders, Shambaugh,** etc.).

As a prophylactic measure to guard against an exacerbation **Taillens** recommends that, in all cases of nasal allergy, pre-operative medication should be given until such time as blood counts show that the eosinophilia has diminished to less than 10%.

When treating allergies of the upper respiratory tract, two therapeutic objectives are of decisive importance: firstly, an unhindered drainage of secretions and, secondly, adequate aeration of the nose and paranasal sinuses. In certain allergic conditions, however, it is only by recourse to surgical intervention that these two requirements can be met.

After these brief remarks on questions of principle, I propose now to turn to the various clinical pictures and to discuss the role which surgical treatment can play in their management.

1. Acute allergic rhinitis due to the influence of exogenous allergens.

Prototype: hay-fever or pollinosis

Here, the main signs and symptoms usually take the form of diffuse inflammatory congestion of the nasal mucosa, associated with sneezing attacks, intranasal itching, and serous discharge. Occasionally **small polyps** develop in the middle meatus of the nose, although these generally regress spontaneously

in response to treatment with antihistamines and particularly corticosteroids. In such cases, **surgical treatment** is therefore **not** indicated; indeed, it is actually contra-indicated. Only in very exceptional instances does one encounter larger polyps which obstruct the inferior meatus and may thus require extremely careful extraction. In our opinion, surgical interventions should not be carried out on the congested turbinates of patients suffering from pollinosis.

2. Vasomotor rhinitis of the perennial type

Typical of the symptomatology of this condition is obstructed nasal breathing — an unpleasant symptom, which often varies in severity — as well as sneezing attacks and the discharge of serous or mucous secretions. In these patients one should try, wherever possible, to distinguish between the **allergic form** (caused by house dust, occupational allergens, etc.) and the **extra-allergic form** by making a close study of the history of the rhinoscopic picture. This is done by examining the discharge for evidence of eosinophilia, and by performing skin tests. In this connection, I would like to draw attention to the differential-diagnostic criteria laid down by **Clerici** and **Teatini.** In both forms of the disease, if possible, an attempt should always be made to manage with causal or conservative medicinal therapy. A detailed account of such treatment is given in my monograph entitled "Diagnostik und Therapie der allergischen und extra-allergischen vasomotorischen Rhinopathie" ("Diagnosis and Therapy of Allergic and Extra-allergic Vasomotor Rhinopathy"). For more common in vasomotor rhinitis than in hay-fever is the development of **multiple** or **solitary**, **small** or **large polyps**, which tend to originate in the ethmoid region. The presence of such polyps is in our experience almost always indicative of an allergy, as is borne out by the fact that a greater or lesser abundance of eosinophils can usually be found in them (**Andersen, Hansel, Hlavácek, Haslhofer, Riccabona, Neumann, Majer, Strömme, Voorhorst,** etc.). **Messerklinger,** as well as **Hussarek** and **Neuhold,** are among those who consider that an increase in the number of mast cells in addition to the eosinophils is a pathognomic — though not a specific — sign of an allergic tissue reaction; and, according to **E. H. Majer**, the same applies to branching and anastomosing processes, involving cells of various forms and sizes.

In the presence of nasal polyps, x-ray examination designed to reveal the condition of the mucosa in the sinuses is invariably indicated. **Taillens** claims that nasal polyposis is virtually always associated with polyposis of the paranasal sinuses on the affected side. In cases where the sinusal mucosa shows no marked changes, careful **endonasal remocal of the polyps** should be carried out. Every effort should be made to avoid damage to the turbinates during the operation.

With regard to these endonasal polypectomies, we feel that radical extirpation, aimed at restoring nasal patency is also desirable in view of the fact the condition is frequently associated with anosmia. When performing the operation, we leave the middle and inferior turbinates untouched as far as possible, and do not undertake any resections on them; we also refrain from opening the ethmoid, so as not to create a too wide nasal lumen by transnasal ethmoidectomy. Whenever we carry out a polypectomy, we administer — always in the post-operative phase, and usually prior to the operation as well — a combi-

nation of antihistamines and corticosteroids as anti-allergic therapy, and in the event of suspected or confirmed infection we also give antibiotics. Among the corticosteroid preparations, β-methasone has yielded particularly good results in our experience and, when cautiously dosed, has hardly ever provoked any undesirable side effects (Fränkel et al.).

The dosage which we employ as a rule, following operations for allergic conditions is as follows:

0.5 mg.	Celestone or Betnesol	3 times daily for 7 days, twice daily for 10 days, and once daily for a further 10 days.

If necessary, this treatment is continued for some time afterwards with small maintenance doses.
Intramuscular depot injections of β-methasone — which, on the average, need only be given once a week — constitute a further advance with regard to corticosteroid therapy. For the purposes of antihistamine medication, we prefer to use long-acting preparations, such as Polaramine retard, Fenistil retard, etc. If the patient is also suffering from catarrh of the lower respiratory tract, resulting in coughing and expectoration, we prefer to use antihistamine preparations such as Phenergan Expectorant or Benylin Expectorant, which help to liquefy the secretions.

A special situation arises in all those cases of prolonged vasomotor rhinitis, in which the rhinopathy has led to **genuine hyperplasia of the inferior turbinates** in particular — associated with polypous, hyperplastic swelling of the margins or posterior ends of the turbinates — and hence to partial or complete obstruction of the nasal lumen. As you may know, certain authors advise against any surgical intervention on the inferior turbinates. **Terracol** and **Chevance,** for example, in their brilliant review of the surgical problems posed by nasal allergies (7th International Congress for Otorhinolaryngology, Paris, 1961), conclude their remarks on the indications for surgery as follows:

"Une conclusion enfin, le respect systématique
du cornet inférieur, organe respiratoire et élément de défense."

It is undoubtedly true, that most rhinologists are reluctant to operate on the inferior turbinates, because of the risk of destroying the ciliated épithelium and thus interfering with an important physiological function. On the other hand, is has been demonstrated that, since the tissues in question show a markedly favourable tendency to regeneration, even the infliction of a severe trauma may be followed by restitution, including restitution of ciliary activity (**Burian, Hilding**). We therefore consider that, when the nasal lumen is completely blocked and, where conservative medicinal therapy — including an attempt at intraconchal corticosteroid injections — has failed, an operation calculated to inflict a minimum of damage, such as a **careful mucotomy or resection of a polypous, hyperplastic posterior tip of the turbinate,** may sometimes be unavoidable and may in itself produce the desired effect, although the results obtained are admittedly often of only limited duration.
When the correct amount of congested hyperplastic tissue was resected from the turbinate, and when care was taken not to excise any of the underlying bone, we never have observed subsequent atrophy of the inferior turbinates resulting in rhinitis sicca; on the contrary, if anything, there is a tendency for renewed hyperplasia to develop after some time has elapsed.

One unpleasant complication which we did encounter, however, took the form of an onset of asthma 8 days after mucotomy had been performed on a young woman. It is possible, that, in this case reflex mechanisms (**Sercer**), mediated via exposed nerve endings, caused the shock to become transferred to another organ, as a result of which the patient developed new symptoms causing her considerably more suffering than before.

Still a highly controversial issue today is the question of **electrocoagulation** as a treatment **for hyperplasia of the turbinates.** By and large, the same arguments probably apply to this form of therapy as well as to mucotomy. Electrodes as described by **Donald**, which can be inserted submucosally, may possibly offer a means of minimising damage to the ciliated epithelium.
In cases of incipient hyperplasia affecting the margins of the turbinates and causing blockage of the nasal passage, we ourselves resort to striate cauterisation. The responses, however, are extremely variable: occasionally the patient obtains permanent freedom from obstruction of nasal breathing, whereas in other cases the relief proves to be only temporary.
And now let us turn to

3. Affections of the paranasal sinuses.

Ridge-shaped, polypous swellings of the sinusal mucosa which, under x-ray show up most frequently in the alveolar cavities or along the lateral wall of the maxillary sinus, and are occasionally observed purely by chance, **do not** in our opinion **call for surgical treatment** as long as they are not associated with infectious processes. On the other hand, such circumscribed polyps in the maxillary sinus sometimes provide the first warning of a progressive nasal allergy, with all that this implies in terms of later hazards, and should terefore not be neglected. They fall, however, within the domain of systematic conservative anti-allergic therapy (**Hansel**).

One clinical observation which we have made repeatedly of late is that the presence of an asymptomatic sinusal polyp is often associated with a refractory, spastice irritative cough. In such cases, the allergic reaction has presumably elicited a shock in two organs at one and the same time, i.e. in the maxillary sinus as well as in the trachea. Accordingly in patients of this kind, who often showed very little response even to the most potent antitussive agents, we have obtained on a number of occasions astonishingly good results by administering β-methasone; as a rule, however, x-ray examination failed to reveal any marked inprovement in the polypous mucosal swellings.

Occasionally — particularly in children — acute polypous swellings in the paranasal sinuses are observed as transient, incidental findings, which may disappear again completely within days or even hours. Polypous changes affecting the mucosa of the paranasal sinuses are generally regarded, and rightly so, as indicative of an allergic form of sinusitis. But since the x-ray findings alone by no means provide a reliable clue to the nature of the pathological changes, one should always look for evidence of infection, also in cases where the x-ray picture reveals polypous clouding. The absence of any demonstrable discharge and, in particular, the fact that rhinoscopy may reveal no flow of pus is, of course, in itself no proof that the paranasal sinuses are free from infection. Nor, if irrigation yields negative findings, does this exclude the possibility of infection. In the polypous, hyperplastic mucosa, there may well be small intramucosal pockets or cysts filled with pus, although no discharge into the lumen occurs. **Grove** has demonstrated that, even in the absence of any free pus, bacteria can be found either on or in the mucosa in 80% of patients

suffering from hyperplastic polypous sinusitis. That **Haemophilus influenzae** plays a cardinal role in the pathogenesis of nasal allergies, and that its presence is frequently overlooked, is a point to which **van Dishoeck** and his collaborators (**Voorhorst, Mulder, Franssen, Hers** and **Goslings**) have drawn attention.
A number of authors **(Bauer, Grove, Nehls, Riccabona, Rüdiger, Wodak)** have recommended endoscopy of the maxillary sinus as an aid to the more accurate diagnosis of conditions within the sinuses. In our opinion, however, a thorough study of the case history and observation of the clinical course, coupled with cytological and bacteriological examination of the nasal discharge, offers the best method of obtaining a closer insight into the pathogenesis and character of diseases affecting the paranasal sinuses.

Some types of allergic sinusitis begin with a primary exogenous allergy and — in the course of time and as a result of repeated relapses — gradually develop into an **allergic-infectious mixed form**. There is no doubt that allergic reactions of the tuberculin type (the so-called "delayed type") imply a predisposition towards secondary infection **(van Dishoeck, Franssen, Hansel, Maggio, Mounier-Kuhn, Takeda).** Conversely, however, infection of the upper respiratory tract is also liable to cause a genuine bacterial allergy resulting from microbial sensitisation. This applies not only to perennial vasomotor rhinitis but also particularly to **chronic hyperplastic, polypous sinusitis.** In the literature, 65-90% of cases of this latter type are listed as being of allergic origin **(van Dishoeck** and **Franssen, Hansel, Silcox, Shambaugh).** Treatment for this condition must, of course, be aimed at combating both aetiological factors, i.e. the allergy and the infection. Whether or not systematic anti-allergic therapy, combined with specific antibacterial medication, will elicit the desired response, depends in such cases largely upon the severity of the histological changes in the mucosa. Whereas purely allergic mucosal changes, including those of a severe type, show a decidedly favourable tendency to regeneration — even of the ciliated epithelium — the chances of a **restitutio ad integrum** are as a rule only very slight in cases where secondary infectious changes have occurred in the form of leucocytic infiltration, epithelial metaplasia, and destructive processes in the tunica propria, especially if these processes are of a **sclerosing, proliferative** nature. In such cases, conservative medicinal therapy alone is doomed to failure. In these stages, various authors therefore recommend that conservative therapy be supplemented by minor surgical interventions which, though inflicting only a mild trauma, serve to restore patency of the nasal passages, to promote drainage of the paranasal sinuses, and thus to re-establish physiological function (**Choppy, Craft, Donald, Evans, Fox** and **Harned, Portmann, Rapaport, Shambaugh, Schenck, Taillens, Vallery-Radot,** etc.). Among these interventions a **careful submucous resection of a nasal septum-deformity,** especially in cases of a severe obstruction of the middle meatus, may be indicated. In contrast to this cautious approach to surgical treatment, there are numerous other writers who advocate radical surgery in all cases of purulent, infectious-allergic sinusitis (**Diamant** and **Ottosson, Grove, Kotyza, et al. Simonton, Uffenorde,** etc.).
Our own standpoint as regards surgical intervention in these affections of the paranasal sinuses can be summarised as follows: **Surgical treatment** is always **indicated** in **chronic hyperplastic, polypous sinusitis with purulent infection.**

a. if attempts at anti-allergic, antibacterial **therapy along conservative lines have proved unsuccessful;**
b. if **threatening complications** of local or focal origin arise;
c. if the **purulent sinusitis** has already persisted for years and the nasal lumen is severely obstructed **by extensive polyps;**
d. if recurrent, relapsing sinusitis of the bacterial-allergy type shows signs of passing into the chronic stage **(microbial allergy)** and leads to massive polypous clouding of the paranasal sinuses in the x-ray picture;
e. if purulent sinusitis has produced a **descending syndrome** resulting in chronic infection of the lower respiratory tract, bronchitis with or without asthma, and bronchiectasis.

In all these situations we try to remove the chronically diseased and infected mucosa as radically as possible. Besides evacuating the maxillary sinus, we usually also perform either a transmaxillary ethmoidectomy or, if necessary, an operation based on the method of **Pietrantoni** or **de Lima.** The importance of careful and radical surgery to clean out the ethmoid has been emphasised by **Riccabona** and **Schröer** in particular; the latter prefers the external approach for ethmoidectomy. The beneficial effect of such sinus operations on the allergic-infectious disorders of the lower respiratory passages can be ascribed chiefly to the elimination of the suppuration in the upper regions of the respiratory tract and to the restoration of nasal breathing. In addition it may possibly also be attributable to the fact that the operation itself provides a nonspecific stimulus which is tantamount to non-specific desensitisation **(Schröer,** etc.). It goes without saying, of course, that these operations should always be undertaken in association with pre- and post-operative anti-allergic and anti-infectious medication, using the combination of antihistamines, corticosteroids, and sulphonamides or antibiotics already referred to in connection with the treatment of polyposis (**Fox** and**Fabricant, Grove, Guerrant et al., Hansel, Hlavácek, Roos, Rüdiger, Shambaugh, Schenck, Schröer).**

In the case of **children suffering from sinusitis,** it is our opinion that — for well-known reasons, such as the danger of damaging the dental system and the fact that the chances of a recovery in response to conservative treatment are better in children — far greater caution should be exercised when deciding whether or not surgical treatment is indicated. We ourselves operate on children only in very exceptional instances, where there is extremely severe chronic suppuration or a danger of complications. It is interesting to note that, in the majority of cases, sinusitis in children can be cured without recourse to surgery — often with sulphonamides alone, although usually by means of specific antibiotic therapy. Accordingly, of major importance in this connection are general roborating measures, climatotherapy and balneotherapy, possibly combined with the use of oral vaccines (Entoral, Lantigen B) as prophylactic treatment to guard against relapses.

In conclusion, I should like to add just a few figures relating to the cases we have treated ourselves; the statistics showing the results obtained are deliberately omitted, because the indications varied so widely that in my view such statistics would not prove very informative.

In the E.N.T. Department of the St. Claraspital in Basel, we have performed during the past 5 years 691 operations on the nose and paranasal sinuses, which can be classified as follows:

	Cauterisation of turbinates	Mucotomy	Endonasal polypectomy	Radical operations on the sinuses	
1961	12	16	31	74	
1962	10	22	26	73	
1963	18	20	33	83	
1964	19	9	42	75	
1965	11	12	35	70	
	70	79	167	375	Total = 691

Assessed on the basis of the case histories, as well as the clinical and particularly the histological findings, the extent to which allergy was involved in all these conditions works out at an average of some 70%, although it should be added that — as already reported by **van Dishoeck** and co-workers — the percentage is considerably higher in cases of bilateral polypous sinusitis or pansinusitis.

This brief outline will, I trust, have shed some light on the purely clinical aspects of the topic I was invited to discuss. It is impossible to provide a categorical, universally valid answer to all the questions posed by the whole problem of **allergy, infection,** and their **surgical treatment.** These questions must be solved on a strictly individual basis after painstaking study, observation, and evaluation of the findings in each particular case. It is only in this way that we can hope to steer a middle course between the two extremes of purely conservative treatment on the one hand, and surgical therapy on the other — a middle course which will enable the patient, who often proves difficult to manage, to derive the maximum of benefit from the treatment.

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