The Journal of Laryngology and Otology
August 1991, Vol. **105**, pp. 635–637

Transnasal sinusectomy with combined microscopic and endoscopic technique

G. P. Teatini, M.D., F. Stomeo, M.D., C. Bozzo, M.D. (Sassari, Italy)

Abstract
Severe, diffuse polyposis can be adequately treated through a transnasal approach which combines microscopic and endoscopic surgery. The operating microscope is used to perform ethmoidectomy, usually from the front to the back, and to open the sphenoid sinus and the antral window. The telescopes allow the sphenoid and maxillary sinuses to be cleaned under direct view control as well as enabling good drainage to be performed from the frontal sinuses. The results from 22 consecutive patients were good, with a very low rate of minor post-operative complications.

Introduction

While the treatment of early or limited polyposis is a matter of controversy between advocates of surgery and supporters of medical therapy, there is almost unanimous consensus that severe, diffuse polyposis should preferably be treated by surgery. Opinions are much more divided regarding the operating procedures which range from the most conservative (simple polypectomy) to the most aggressive (external sinusectomies).

Our personal attitude has shifted in the past 20 years from a tendency towards extensive radicalism to a procedure fostering functional preservation. For example, our preferred techniques for maxipolyposis changed about 10 years ago from transmaxillary ethmoidectomy to intranasal ethmoidectomy combined with antrostomy (Morgenstein, 1985). This transition was also stimulated by the introduction of the operating microscope (Dixon, 1985; Bagatella and Mazzoni, 1986) which allows a more meticulous inspection of the mucosa lining the nasal cavities.

The subsequent spread of endoscopic surgery (Kennedy and Zinreich, 1985; Wigand, 1989) prompted us to combine it with microsurgery, thus profiting from the benefits of both procedures and minimizing the respective disadvantages. The clinical material of the present paper consists of two series of patients, the first treated with intranasal ethmoidectomy plus antrostomy carried out under the microscope, and the second operated by intranasal sinusectomy performed with both microscopic and endoscopic surgery.

Clinical material and surgical methods

Group 1—Microscopic technique

This first series of patients includes 78 adults, treated between 1983 and 1986. All of them were primary cases and had bilateral operations, as is usual in maxipolyposis.

Accepted for publication: 25 March 1991.

Surgery started with mobilization or correction of the septum, performed with the naked eye. This step was omitted only when both nasal fossae were wide and completely visible. There was no hesitation in correcting even slight deviations, as any improvement in breathing was considered likely to benefit the patient.

In the majority of patients, ethmoidectomy was carried out from front to back but in some revision cases, and whenever CT scans aroused suspicion of a dangerous situation along the cranial floor, the operation was started from the back (Wigand, 1981) in order to identify immediately the sphenoid roof which is continuous with the fovea ethmoidalis. In such a case, the middle turbinate was usually resected.

The technique to be described refers to retrograde (*i.e.* directed backwards) microscopic ethmoidectomy. At the outset, the intranasal landmarks are few. Very often, the middle turbinate is barely discernible from surrounding polyps. It may be useful to remove some of them to obtain a better view of this structure which is preserved, whenever possible, and outfractured.

All descriptions of surgical procedure state that intranasal ethmoidectomy starts with opening the bulla. In cases of maxipolyposis it is never possible to identify it. One therefore begins by removing polyps from the middle meatus within an area enclosed between two straight lines, parallel to the superior and inferior limits of the free hanging part of the middle turbinate. It must be remembered that anteriorly the lateral ethmoid wall (lamina papyracea) is only a few millimetres distant from the meatus, but the actual width must be evaluated from the coronal CT scans (Fig. 1). When enough space has been cleared to allow identification of the lamina papyracea, the ethmoid roof has to be reached. For this purpose, the difference between the heights of the nasal vault (which is in front of the eyes) and the ethmoid roof must again be inferred from the coronal scans (Teatini *et al.*, 1987). The two dangerous limits of the ethmoid, *i.e.* lateral and superior, should be identified as soon as poss-

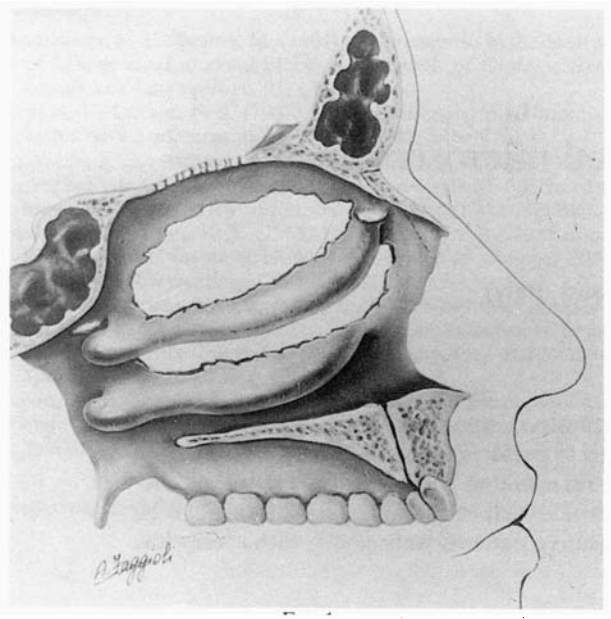

FIG. 1

A coronal scan in a plane a few millimetres behind the middle turbinate tip permits assessing: a) distance between the medial wall of the meatus and orbital plate; b) height difference between nasal vault and ethmoid roof.

ible. Thereafter, the removal of polyps may proceed very quickly, without losing contact with these walls (Fig. 2).

Usually, polyps in the most cranial and dorsal part of the nasal fossa can be directly reached through the wide gaps in the plate which connects the lower margin of the middle turbinate to the ethmoid roof (the so-called lamina of the turbinates) (Fig. 3). The sphenoid sinus is entered both from the ethmoid and from the nasal fossa in order to create a broad opening.

The ethmoidectomy ends with cleaning of the preinfundibular cells. This area cannot usually be directly seen, regardless of the inclination of patient's head, so the cells are gently curetted with the angled forceps. The procedure is completed by means of an antrostomy performed in the inferior meatus. Such an opening provides only a limited view of the sinus inside, and most polyps must be removed blindly.

Group 2—Microscopic plus endoscopic technique

The second series includes 22 adults, treated during the years 1988–1989. All of them were again primary cases and had bilateral operations.

In this series, the surgical technique, which is similar to that of Rudert (1988), consists of three steps. The first two are the same as in the previous procedure, *i.e.* mobilization or correction of the septum, performed with the naked eye, and ethmoidectomy, carried out under the microscope. The operation is then concluded by endoscopic surgery, which is used for three main purposes:

a) to inspect and clean the sphenoid sinus. The well-known relationships between this cavity and several neurovascular structures of importance demand that surgical manoeuvres are done under visual control. Except in underdeveloped sinuses, this can be achieved exclusively through telescopes with deflected angles of view;
b) to open the preinfundibular cells and the frontal recess. Only telescopes allow one to treat this area under full visual control. This step should never be omitted, as ensuring good drainage to frontal sinuses is one of the main goals of the procedure;
c) to inspect and clean the maxillary sinus. With the aid of telescopes it is possible to excise polyps fairly rad-

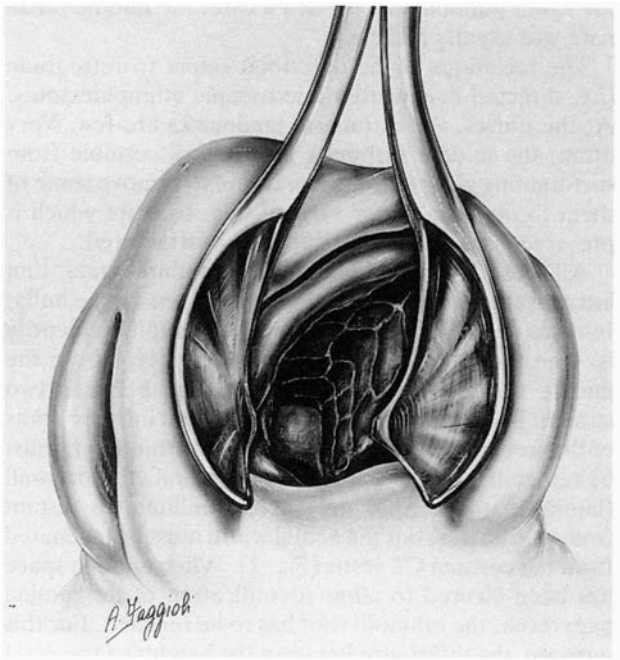

FIG. 2

Ethmoidectomy has been completed. The ethmoid roof and the orbital plate are exposed. The middle turbinate inferior portion has been outfractured and preserved. Reprinted from Teatini, G., Bagatella, F. (1989) Chirugurgia della fistole cribro-meningee. In: trattato di tecnica chirurgia (Paletto, A. E., ed) pp. 236–251, volume 12, UTET, Torino, with permission.

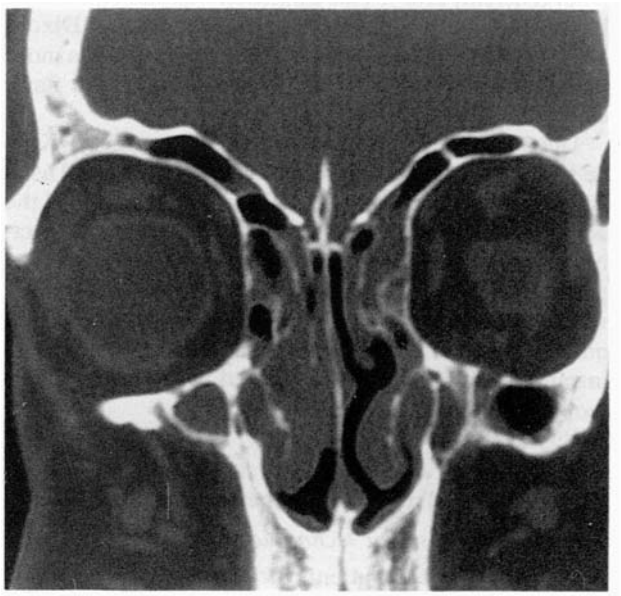

FIG. 3

Sagittal view at the end of ethmoidectomy. The so-called turbinate plate, connecting the middle turbinate free hanging part with the ethmoid roof, usually shows wide gaps through which polyps break into the nasal fossa.

https://doi.org/10.1017/S0022215100116883 Published online by Cambridge University Press

ically through a small opening. We find it helpful to work through two windows, one in the inferior and one in the middle meatus, inserting the telescope in one and the forceps in the other.

Results

Microscopic technique

There were only minor complications, *viz.* orbital ecchymosis (15 cases) and crusting for more than two weeks (18 cases). The interval between post-operative controls was 4–6 months. Most of the patients received topical steroids.

The minimum follow-up lasted two years. After this period, 47 patients (60 per cent) were completely free from polyps, 20 (25 per cent) presented uni- or bilaterally some small, non-obstructing polyps, amenable to medical treatment; 11 (14 per cent) required revision surgery for purulent maxillary sinusitis (two cases) or for recurrent polyps (nine cases). Among the latter, two had a diffuse polyposis, but in the remaining seven the source of the recurrence appeared to be the maxillary sinus. It would seem that the main cause of failure in our cases was the insufficient treatment of antral polyps.

Microscopic plus endoscopic technique

Again, post-operative complications were trivial. A mild unilateral orbital ecchymosis was observed in three cases. Two patients developed haemorrhage on pack removal, and had to be packed again.

These subjects were followed up much more intensively, at intervals of one month. All of them were treated with topical steroids. As soon as even small polyps appeared (five cases), they were removed endoscopically in the office. After one year, no obstructive recurrences were observed; only three patients presented at the last follow-up a recurrence of small polyps along the ethmoid roof.

Discussion

Both techniques, microscopic and endoscopic sinus surgery, have advantages and disadvantages. The main advantages of microscopic surgery are:

a) magnification, which allows a more precise identification of the structures encountered during surgical manoeuvres;
b) the possibility of working with a wholly stereoscopic vision even in very narrow and deep fields, which is probably the main benefit;
c) an opportunity for teaching, which was practically impossible with naked eye surgery.

Endoscopic surgery shares some of the advantages of microsurgery, *i.e.* magnification and the opportunity for teaching. Its unique characteristic is the possibility of looking 'round the corner', that is, to see areas out of direct vision and work there with specially designed instruments. This is particularly important in transnasal-surgery, where a rather large area (the sinus cavities) must be reached through a very narrow route of access (the nostril and the nasal fossa). The most serious disadvantage, in our opinion, is the absense of stereoscopic vision and hence the appreciation of depth. Profuse bleeding is harmful in both procedures, but with the microscope it is possible to avoid this by insertion of the self-retaining speculum which permits surgical manoeuvres under continuous suction.

In our experience, the combination of microscopic and endoscopic surgery seems to be valuable in the treatment of maxipolyposis, minimizing the disadvantages of each technique and permitting a more radical excision, chiefly from the maxillary sinus. The results we obtained with this procedure are better than those with microsurgery alone, even though they were evaluated after a shorter period. However, it must be stressed that such an improvement could also be attributed, at least partially, to a more careful follow-up. In the second series post-operative controls were carried out at shorter intervals (30 days) and any recurrence was immediately excised through endoscopic vision. We intend to keep on checking patients for up to three years, since after this period reappearance of polyps is quite rare, as observed by Sogg (1989) in a follow-up of 6 to 12 years.

Acknowledgement

The paper was prepared with financial support of a 60 per cent MURST grant.

References

Bagatella, F., Mazzoni, A. (1986) Microsurgery in nasal polyposis. Transnasal ethmoidectomy. *Acta Otolaryngologica* **Supplement 431:** 1–19.

Dixon, H. S. (1985) The use of the operating microscope in ethmoid surgery. *Otolaryngologic Clinics of North America,* **18:** 75–86.

Kennedy, D. W., Zinreich, S. J. (1988) The functional endoscopic approach to inflammatory sinus disease: current perspectives and technique modifications. *American Journal of Rhinology,* **2:** 89–96.

Morgenstein, K. M. (1985) Intranasal sphenoethmoidectomy and antrostomy. *Otolaryngologic Clinics of North America,* **18:** 69–74.

Rudert, H. (1988) Mikroskop- und endoskopgestützte Chirurgie der entzündlichen Nasennebenhöhlenerkrankungen. *HNO* **36:** 475–482.

Sogg, A. (1989) Long-term results of ethmoid surgery. *Annals of Otology, Rhinology and Laryngology,* **98:** 699–701.

Teatini, G., Simonetti, G., Salvolini, U., Masala, W., Meloni, F., Rovasio, F., Dedola, G. L. (1987) Computed tomography of the ethmoid labyrinth and adjacent structures. *Annals of Otology, Rhinology and Laryngology,* **96:** 239–250.

Wigand, M. E. (1981) Transnasale, Endoskopische Chirurgie der Nasennebenhöhlen bei chronischer Sinusitis. III. Die endonasale Siebbeinausräumung. *HNO,* **29:** 287–293.

Wigand, M. E. (1989) Endoskopische Chirurgie der Nasennebenhöhlen und der vorderen Schädelbasis. Thieme: Stuttgart-New York.

Address for correspondence:
Gianpietro Teatini, M.D.,
Clinica Otorinolaringoiatrica dell'Università,
Viale Mancini 5,
I-07100 Sassari.

Key words: Paranasal sinus surgery