SURGERY OF THE SINUS, A VANISHING THERAPY

W. F. B. Brinkman, M.D.

The first task of a physician is to make himself superfluous, and a clear example of it is found in the surgery upon the sinus for sinusitis. A comparison between any handbook of rhinology from roundabout 1900 with one dated 1960 will show that the importance of sinus surgery is diminishing.

Therefore, it is a matter of course that in a paper on modern sinus surgery some thought is given to this significant fact. As regards the treatment of sinusitis and especially chronic sinusitis opinion has undergone a revolutionary change for the last twenty years. I still very well remember the publications in which a complete surgical clearing of the paranasal sinuses was recommended as a pre-eminent treatment of pansinusitis (even if it was of an allergic origin), a so-called pansinussectomy. At present more respect is shown for the functional meaning of mucous membrane and sinus. This complete change was brought about by the progress made in anti-bacterial therapy, while an important part was also played by the success of the anti-allergic treatment.

Allergy forms one of the most important factors in the origin and persistence of mucosal inflammations, and, in particular, of those in the upper respiratory tract.

Modern sinus surgery has become a paradox.

At present little is read of new techniques. All well-known names connected with operations on the sinuses date, a few exceptions made, from roundabout 1900. Suffice it to mention amongst others Hajek, Caldwell, Luc, Killian, Denker, Riedel, Seiffert, Uffenorde and Claoué.

These are the principles on which surgery on the paranasal sinuses should be based:

1. An anti-inflammatory and, if necessary, anti-allergic treatment of sinusitis before as well as after the operation.
2. Surgical treatment should as much as possible be limited in order to preserve the greatest possible amount of mucosa.
3. A mucosal inflammation can heal very well if the conditions are favourable or are made so.
4. It is hardly necessary any more to remove the conchas and to strip the mucous membrane of the entire sinus.

We are, therefore, to see to it, that the functional process of the nose and the paranasal cavities remains as much as possible unaffected and that it is hardly damaged at all by our surgical treatment.

A clear view of the operating field is a basic condition which is applied throughout the whole field of surgery. Otolaryngology sometimes seems to make exception to it.

Here I mean, in particular, those intranasal surgical procedures which have been recommended in the course of years, for instance probing the frontal sinus, scraping the nasofrontal duct, the clearing of all sinuses by way of the antrum of Highmore, which can be carried out almost blindly only. Fear of

scar formation in the face will undoubtedly have been the reason to save the facial skin as much as possible. Besides, by intranasal surgery hospitalization may sometimes be avoided. But whether this is so conducive to the patient's state of health is a matter of doubt.

At one time it seemed as if the otolaryngologist had for years been chary of hospitalizing patients, a result of which was that he had to put up with small operation rooms, usually far away from the official operating theatres.

It is evident that the general laws of surgery also hold good for sinusitis surgery.

A clear view of the area to be operated on is necessary, and that is why, as a rule, the external approach will be the only correct one. The enthusiasm for operations like Lima's had better be discarded as soon as possible. It is more than frightening in these operations to see the various instruments disappear into the nose where they are to carry out blindly something that is only supposedly done in the right place. The number of anatomic variants is so great and dangerous spots like the lamina cribosa and abnormalities, if any, like the menigocele so close by, that once and for all this blind operating technique must be done away with. Through a careful aseptic and atraumatic technique most scars from external incisions, like Moure's and Killian's, will hardly remain apparent to the eye.

It is not only the new therapeutic treatment that has diminished the number of chronic sinusitis cases, but also improved hygiene, a higher standard of living and consequently earlier treatment. A more thorough and an earlier treatment of the acute stage will keep sinusitis from becoming chronic, and thereby it will prevent surgery on the sinus.

Surgery of the maxillary sinus.

Before proceeding to any surgical treatment of the maxillary sinus for chronic maxillary sinusitis it is very useful to give before as well as after the operation an antibiotic combined or not with cortico-steroids. It is striking how the operating field calms down then. Thus it will even more often appear to be possible to confine oneself to a Claoué operation .

Moreover, the inferior concha is preserved; if necessary, it may be luxated temporarily. A large opening is made under the inferior concha, the nasal mucosa is carefully incised, and the mucosal flap thus formed is laid in the operation cavity. Thus one gets a fairly clear view of the sinus, which can be cleansed while as much as possible mucosa is preserved. A drainage tube is left in the opening through which the sinus can be flushed with a proper antibiotic.

In case of serious inflammations and especially when they are accompanied with many polyps a Caldwell-Luc operation is to be employed. The technique is supposed to be sufficiently known. When ethmoiditis occurs with it only those cells may be removed from the maxillary sinus which are exposed to view. Should it be necessary to clear up the rest of the ethmoid sinus the external approach should be used. As a rule the maxillary sinus need not be packed after the Caldwell-Luc operation. It is my experience that it will heal sooner and it eliminates the painful removal of the pack. I do leave a drainage tube through the nose through wich the cavity can be flushed with a proper

antibiotic in the after-treatment. The ingress of fibrous tissue formatives from the cheeck through the canine fossa can be avoided by bringing a flap of mucosa across the opening (Abello-Vila).

The Denker operation should not be carried out any more as it has come to be established that it is harmful to the incisors and canine-teeth (Werner-Schicktanz). If external surgery is required to eradicate chronic ethmoiditis I prefer the middle part of Killian's incision and Jansen - Ritter's operative technique. With this approach the posterior ethmoidcells are within easy reach, and besides, if required, a test puncture can be made in the floor of the frontal sinus. Very often, however, I have seen a case of chronic ethmoid disease heal owing to the use of antibiotics and an anti-allergic therapy after a simple removal of polyps.

After a Caldwell-Luc, Claoué or Jansen-Ritter operation for chronic sinusitis the patient should be examined regularly, if necessary, for years in order to apply in time antibiotics or an anti-allergic therapy, when necessary. It will prevent a renewed growth of polyps, a thickening of the mucous membranes and nasal congestion. If the patient remains under close medical inspection and receives proper treatment he has no longer to have his polyps removed annually.

Surgery of the frontal sinus.

The subject most widely discussed in recent publications remains the operative technique for chronic frontal sinusitis. There are a great number of techniques, which, as a rule, does not speak in favour of their effectiveness. Most of them are some 50 years old.

The external approach is the proper procedure; whether the puncture is made slightly higher or lower is no matter of prime importance. The best thing is to flush with a proper antibiotic by way of a drain through the puncture. **Antoniuk** points out the possibility of polyclinically puncturing the frontal sinus through the skin of the forehead provided that one has determined beforehand the exact place where the puncture is to be made.

Some still advocate a luxation of the middle concha in frontal sinusitis. I myself no longer do it, and I think it does not matter much.

About the surgical treatment of chronic sinusitis there is a wide divergence of opinion:

1. the external approach.
2. the internal approach.
3. the interantral approach.

Fundamentally the various surgical procedures date from round-about 1900.

Ogston—Luc (1884—1893): a horizontal incision is made from the glabella laterally, after which the frontal sinus is opened with a perforator.

Killian (1906): via the well-known Killian's incision the anterior wall and floor of the sinus are removed but without the supra-orbital ridge.

Riedel (1898): a skin and periosteal incision is made through the eyebrows down to the inner canthus of the eye, after which the entire anterior wall, as well as all mucosa, is removed. After the operation the skin sags down into the opening. This is the first obliterating operation.

Killian—Hajek and Uffenorde (1898) have devised techniques for the endonasal (internal) approach to the frontal sinus.

The origin of the interantral method cannot be quite traced back. It was Pietrantoni by whom these procedures became widely-known, but in particular by **de Lima** (1936). Pietrantoni emphasizes that it is better to use the extranasal route to treat the frontal sinus.

At present it is generally held that the external approach is the proper surgical procedure both for acute and chronic sinusitis. As regards the external surgical treatment of chronic frontal sinusitis one can proceed from two possibilities:

1. preserving or reconstructing the nasofrontal duct.
2. obliteration of the frontal sinus without preserving the nasofrontal duct.

One of the great number of adherents of the first group is **Boyden.** He is using a flap of mucoperiosteal membrane for lining the reconstructed nasofrontal duct after removal of every partial of mucosa from the sinus and removal of diseased ethmoid cells. **Dylenski** tries to keep the nasofrontal duct open by means of a silk thread with metallic pearls of different sizes. **Tremble** uses a polyethylene tube wrapped in a splitthickness graft from the inner surface of the patient's thigh with the raw surface outward. The tube is inserted into the frontal sinus through the nose. Others try to keep the duct open by means of temporary acrylic mold obturators of polyethylene tubes or other inlays to prevent adhesion.

But by far the greater number of authors advocate the obliterating method, because first-mentioned operations have had drawbacks since the surgically constructed nasofrontal passage was too often obstructed by scar tissue. **Goodale and Montgomery** describe the anterior osteoplastic approach to the frontal sinus (which varies from the Jansen-Lynch-Boyden operation which is usually followed in the U.S.). Fat from the abdominal wall is used to obliterate the frontal sinus (Bergara-Tato). **Lemoyne** obliterates the nasofrontal duct by means of spicules of bone from the crista iliaca superior anterior. **Glaninger** follows the Riedel operative technique but he uses alloplastic material to prevent deformities, by which same principle also Vytrishchak, Grenichanyi, Volkland and others are guided.

I myself successfully apply a combination of an incision from temple to temple as was described by Macbeth, and the use of alloplastic material. The anterior wall of the frontal sinus is with the greatest care and accuracy removed and the same is done with the mucosa. The nasofrontal duct is covered with a periosteal flap, and the forehead is re-shaped by means of an acrylic substance which when hot is freely manipulated and hardens quickly when cold water is poured over it after it has moulded into the cavity. Then the skin it swung back and sutured. The advantages are no scars in the face, and an extremely good view of the frontal sinus, the front part of which is removed with a burr and in spite of a complete obliteration there are no deformities of the forehead.

In an emergency the operating method described by **Bordly** and **Cherry** will lead to good results: it is a rhinotomy operation where the nasal pyramid is swung away to one side after several incisions, a bilateral osteotomy and a

submucous resection of the septal cartilage. It is by all means useful in case of tumors, but therefore falling outside the scope of this paper. (Chassaignac-Bruns).

Surgery of the sphenoid sinus.

The operation on the sphenoid sinus for sinusitis is only seldom discussed. Sphenoid sinusitis is extremely rare. Out of 5000 roentgengrams of the paranasal cavities taken in my clinic in recent years there was not one showing any cloudiness of the sphenoid sinus resulting from sinusitis. The only cloudiness visible was caused by tumors. The attention at present directed to the sphenoid sinus is due to its relationship to the hypophysis. The operative techniques of **Cushing** (1912), **Hirsch** (1910), **Chiari** (1912), **Moure** (1902) and **Faure** (1903) come into use again, because they make a trans-sphenoidal approach to the sella possible. For the past few years many among whom Biber, Lambert, Hamburger-Guiot, have thrown their lights upon it.

I would like to draw your attention to **Hage's** technique. He reviews **Rëthi's** approach to the subcutaneous structure of the external nose, and recommends a modification and extension of the operation as a universal approach to the external and internal nose. This principle can be used in the surgical treatment of hypophysis tumors.

LA CHIRURGIE DES SINUS, UNE THÉRAPEUTIQUE EN VOIE DE DISPARITION

En comparaison avec la place qu'occupait, il y a cinquante ans, le traitement chirurgical de la sinusite dans la littérature otorhinolaryngologique, les publications actuelles sont rares. La grande majorité des techniques prétendument nouvelles sont des variations d'opérations d'il y a environ cinquante ans, époque à laquelle sont toujours liés les noms bien connus d'un Kilian, d'un Claoué, d'un Caldwell, d'un Luc etc.

En général, l'on constate, principalement dans les pays anglosaxons, que les voies d'approche endonasales et transmaxillaires vers les sinus sont actuellement de plus en plus abandonnées. Etat de choses heureux, puisqu'une bonne technique chirurgicale exige un champ opératoire que la vue puisse embrasser.

La littérature prête relativement le plus d'attention au traitement chirurgical de la sinusite frontale. Certains préfèrent la technique de l'oblitération, d'autres essayent de maintenir ou bien de reconstruire le canal nasofrontal. Personnellement je préfère, pour l'intervention chirurgicale dans la sinusite frontale chronique, la technique du lambeau pédiculé, suivie de la restauration des contours frontaux au moyen d'acrylic. La technique chirurgicale cherchant à atteindre le sinus sphénoïdal a trouvé une nouvelle impulsion dans la tendance actuelle de la chirurgie hypophysaire qui préconise la voie nasale. Ici encore les vieux principes de Cushing, de Chiari, de Hirsch et d'autres se maintiennent.

Une modification de la technique de Réthi est signalée.

BIBLIOGRAPHY

Abello-Vila, P.: Indications et résultats de nos modifications techniques dans la chirurgie du sinus maxillaire. Proc. of the VIIth int. Congress of Oto-Rhino-Laryngology. Paris. 1961.

Antoniuk, M. R., The Trephine-puncture Method in Diagnosis and Therapy of Diseases of the Frontal Sinuses.
Acta Otolaryngol., 54 : 111, Febr. 1962.

Bergara, A. R., and Bergara, C., Chronic Frontoethmoidal Sinusitis: Osteoplastic Method According to Author's Technique, Ann. Oto-Rhino-Laryng.
Uruguay 5 : 192—200, 1955.

Biber, J. J., The Hypophysis-Border-Line Subject between Rhinology and Brain Surgery.
Proc. of the 4th Int. Congr. of Oto-Rhino-Laryng. London, 1949.

Bordley, J. E., and Cherry, J., The Use of the Rhinotomy Operation in Nasal Surgery, The Laryngoscope, 70 : 258—270, 1960.

Boyden, G. L., Tr. Am. Acad. Ophth. 61 : 588—591, Sept.-Oct. 1957.

Dawes, J. D. K., The Management of Frontal Sinusitis and its Complications.
J. Laryng., 75 : 297—344, 1961.

Goodale, R. L., and Montgomery, W. W., Experiences with the Osteoplastic Anterior Wall Approach to the Frontal Sinus.
A.M.A. Arch. Otolaryngology 60 : 271—283, Sept. 1958.

Guiot, G., Thibaut B., and Boutteau M., Extirpation des adénomes hypophysaires par la voie trans-septale et trans-spénoidale.
Annales d'oto-laryngologie. 76 : 1017—1031, 1959.

Hage, J. An "external" Intraseptal Approach to the Sphenoid Sinus and the Hypophysis for closure of cerebrospinal Fluid leaks.
Archivum Chirurgicum Neerlandicum, Vol. XIII, fasc. 2, 1961.

Hamberger, C. A., Hammer, G., Norlen, G., and Sjogren, B., Transantrosphenoidal Hypophysectomy.
Arch. Otolaryngol., 74 : 2—8, July, 1961.

Kloods, R. R. Operative Treatment of Chronic Frontal Sinusitis. Proc. 4th Int. Congr. of Oto-Rhino-Laryngology, London, 1949.

Lambert, V., The Trans-sphenoidal approach to the Sella.
Proc. 5th Int. Congr. of Oto-Rhino-Laryngology, Amsterdam, 1953.

Lemoyne, J., L'exclusion du sinus frontal.
Proc. 7th Int. Congr. of Oto-Rhino-Laryngology, Paris, 1961.

Macbeth, R. G., The Osteoplastic Operation for chronic infections of the Frontal Sinus.
J. Laryng. and Otol. 68 : 465—477, July, 1954.

Nishilata, T., Polysinusectomy and Pansinusectomy.
Arch. Otolaryngol. 74 : 243—250, Sept. 1961.

Tato, J. M., Sibbald, D. W., and Bergaglio, O. E., Surgical Treatment of the Frontal Sinus by the External Route.
The Laryngoscope 64 : 504—514, June, 1954.

Tremble, G. E., A.M.A. Arch. Otolaryngol. 63 : 254—259, 1956.

Volkland, H., Der Visierlappenschnitt bei Kunststoff-unterpflanzung im Stirnbereich.
Zentralblatt f. H.N.O. 68 : 144, 1960.

Vytrishchak, V. I., and Grenichanyi, K. V., The Use of a Quick-setting Plastic Mass (Stirakril) for Plomade of the Frontal Sinus.
Vop. Neirokhir. 24 : 53—54, March-April, 1960.

Prof. Dr. W. F. B. Brinkman,
Afd. K.N.O.
Academisch Ziekenhuis,
Nijmegen, Netherlands.