RECENT ADVANCES IN MANAGEMENT OF RECURRENT AND CHRONIC SINUSITIS: TREATMENT

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To understand the changes which are taking place in management of rhinosinusitis, it is first necessary to appreciate the traditional methods of therapy, and especially the surgery of chronic sinusitis as practiced until very recently. Simple acute sinusitis was and is managed by antibacterial therapy, using a bactericidal drug where possible, and bearing in mind that penetration of the sinuses is relatively slow, so that a meaningful course of treatment lasts seven to fourteen days. Nonresolving acute sinusitis usually affects the antrum, and lavage is a traditional treatment which remains useful. Nonresolving frontal sinusitis always threatens serious complications, because of the sinus' proximity to the anterior cranial fossa. The traditional treatment was a trephine of the sinus' floor, a relatively invasive procedure which has some potential to spread infection to the periorbita and skin (Fig 1). Nonresolving sphenoidalitis is rare, but has been treated by sphenoidal lavage, nowadays usually performed, like frontal sinus trephine, under general anaesthetic.

![Fig 1 - Trephine of R Frontal Sinus. The suratrophlear nerve is at risk]

Traditional management of chronic sinusitis has stressed a direct surgical assault on the major sinus principally affected. As maxillary sinusitis has been the commonest form to come to clinical attention, operations on the antrum have been very frequently performed. The more conservative option has been INTRANASAL ANTROSTOMY (referred to in the USA as "nasoantral window"). The antrum drains against gravity into the middle meatus. The antrostomy is classically fashioned via the inferior meatus, giving gravitational drainage (Fig 2). The procedure is quick, and certainly relieves the acute pain of an empyema, but it is not entirely physiological. When the cilia recover from the infective episode, they will once more move antral mucus by the unaltering physiological pathway to the natural ostium, which, if still obstructed, will refuse it drainage. Stasis will follow, and it is only when the antrum contains a substantial quantity of static mucus that gravitational drainage occurs through the "window". The successful antrostomy probably works by relieving a chronic empyema and allowing both mucociliary function and ostial drainage to recover. In the less successful, but useful, case, there will be episodes of recovery, and periods when overload leads to more or less infected mucus being episodically released in surprising quantities (the average antrum can hold 12-15cc) when the nose is blown, or a hearty sniff is performed. In the unsuccessful case, pain may cease, but copious purulent drainage continues.

![Fig 2 - A) Punctured by trochar B) Inferior meatal antrostomy raised]

RECENT ADVANCES IN CHRONIC SINUSITIS

The radical option, classically used where intranasal antrostomy fails, is the sublabial or Caldwell Luc approach (with its variants, Denker's operation and Canfield's procedure). Here, the antrum is opened from in front, usually with a mallet and gouge. The incision for the Caldwell Luc is shown in Fig 3. The Denker approach extends the incision across the nasal pyramid, and allows the operator to bring the nose and antrum into continuity at the pyriform aperture, by taking down the anterior maxillary buttress. The Canfield procedure gains access through the nose, by incising laterally across the pyramid – a Denker in reverse (and, incidentally, despite certain arguments to the contrary, the writer's preferred method for inspecting and biopsying a tumour of the maxillary sinus). Having made a generous bony window, the surgeon attempts to remove the entire sinus lining, and creates a generous inferior meatal antrostomy. One would think this would bring certain cure, but, as explained in the earlier article, if osteomeatal obstruction really results from disease of the ethmoids, and if any mucosal recovery will be followed by further attempted mucociliary transport via the (obstructed)
natural ostium, cure then looks less likely. In practice, most otolaryngologists have been disappointed with the results of the radical antrostomy for many years, and a proportion of such patients have been left to accept chronic purulent nasal drainage for the rest of their lives.

Fig 3 - Incision for R Caldwell (incision above tooth crowns)

Chronic frontal sinusitis has long been recognised as a difficult problem. External frontoethmoidectomy (Fig 4) has a more logical basis than the Caldwell-Luc procedure, as it attempts to restore a physiological route of drainage, but it has far from always been successful, perhaps because insufficient attention has been paid to the ethmoid cells, or to the natural position of the frontonasal duct, and perhaps because recurrent mucosal polyp and granulation formation have tended to re-obstruct the duct region. The operation has often been associated with numbness in the distribution of the supratrochlear and even supraorbital nerves, and the Howarth incision may web if not planned and sutured well, while the Patterson approach requires mobilisation of the nasolacrimal duct. The radical osteoplastic flap procedure (Fig 5) with obliteration of the sinus using fat or bone pate, is exciting to perform but not always gratifying in its results, and it is invasive, although cosmesis is often very good. Direct attacks on the sphenoid are less common, and usually performed through the posterior ethmoids, as a fairly logical procedure.

Fig 5 - Osteoplastic flap approach to frontals
A: Eyebrow incisions  B: Coronal incisions

The modern approach abandons the emphasis on surgery of the major peripheral sinuses, and concentrates on the underlying disease which is the most frequent, and often the causative problem: ethmoidal air-cell disease, obstructing the frontonasal duct, the antral ostium, the sphenoidal ostium, and, of course, the drainage of the critically implicated ethmoid cells themselves. The approach is not so revolutionary; Caldwell himself laid great stress on the importance of ethmoid disease when describing his own approach to the antrum (2). With use of the flexible or rigid nasendoscope (Fig 6) and the coronal CT scan (Fig 7) the ethmoidal lesion can be clearly identified, as can such septal spurs or pneumatised conchae as may also contribute. These factors may then be addressed in one of three ways:

1. **Intranasal ethmoidectomy**

   This may be performed under direct vision, using a headlight and speculum under general anaesthesia. The orbital peristium cannot be directly visualised, and the eye and optic

Fig 4 - R external ethmoidectomy area of initial bone removal via Howarth incision.

Fig 6 - Left to right: Antral trochar and cannula, Rigid 30° nasendoscope, Flexible fibreoptic laryngoscope
anaesthesia in co-operative adults, and to remove areas of polyp formation and osteomeatal disease under accurate direct vision. Straight endoscopes are used for the surgery, in contrast with the angulated view of the diagnostic instruments. The surgeon must undergo training in the technique, and it is of special importance that he or she perform a series of full sphenoidectomies in fresh cadavers with the endoscopes and instruments. FESS is effectively intranasal ethmoidectomy guided by high-quality endoscopic vision, but the risks to the orbit, optic nerve, floor of the anterior cranial fossa and carotid are identical to those in conventional ethmoidectomy performed through the nose. Familiarity with the endoscopic appearance of anatomical landmarks is vital. Local anaesthesia not only reduces the invasiveness of the operations, rendering them basically outpatient procedures, but is also a safety factor: a conscious patient is unlikely to tolerate injury to the orbital contents or optic nerve.

Using the endoscopes, exponents of the technique claim that mucosal disease can be cleared with more accuracy, and surgery restricted to what is necessary to permit restoration of drainage – hence the term “functional”. The technique falls within the current move towards minimally invasive surgery permitted by recent developments in rigid and flexible light systems adapted to small endoscopes. It will not be a cure-all for mucosal disease of the nose and sinuses, and its current advocates (of whom Prof. Heinz Stammberger of Graz, and Dr. David Kennedy of Philadelphia are the best known) stress the continuing need for medical management of nasal allergy and infection.

**DEVELOPMENT OF AN ENDOSCOPIC SINUS SERVICE IN LANCASTER**

I have now attended a foundation course on FESS, and received instruction from Prof. Stammberger, Dr. Kennedy and my British colleague, Mr. Ian Mackay, to all of whom I am indebted for their teaching. Rigid nasendoscopes are now available in clinics at Morecambe and Kendal, and I use them in conjunction with the flexible laryngoscope as a routine in examining nasal cases. The surgical instrumentation has been ordered, and delivery is expected before this article goes to press. I shall then perform a series of cadaver dissections in the postmortem room at the Royal Lancaster Infirmary, and I hope to visit colleagues practising the technique to witness their clinical work before beginning to perform operations - hopefully early in 1993. Meanwhile, I am already performing increasing numbers of conventional intranasal ethmoid procedures, guided by CT scans, for cases of chronic sinusitis, and I now routinely make middle meatal antrostomies by way of the ethmoidal infundibulum. Early results are pleasing.

My hope is that, in two or three years from now, minimally invasive procedures will by my first line of treatment or both chronic and unresolved acute sinusitis. My last illustration shows a patient, who may be recognised by some readers, recovering from an external ethmoidectomy, which was performed because a peri-orbital abscess had developed after a frontal sinus sphene to drain an empyema (Fig. 8). This may help to explain my increasing commitment to accurate endonasal techniques for the relief of such problems.

**REFERENCES**