POSTERIOR TYMPANOTOMY

ITS IMPORTANCE IN COMBINED APPROACH TYMPANOPLASTY

By G. D. L. SMYTH, R. M. ENGLAND, R. GIBSON and A. G. KERR (Belfast)

RECENT articles on tympanoplasty have placed overwhelming emphasis on the problems of hearing restoration. This might suggest that the eradication of disease no longer poses serious technical problems, which is unfortunately not true.

As time passes, there is increasing enthusiasm for the transmeatal approach in the surgical treatment of chronic otitis media, provided that the pathological process can be controlled by this route. When this cannot be done, some authors, more adventurous, recommend a combination of the transmastoid and transmeatal routes (combined-approach tympanoplasty) to avoid the otherwise inevitable open cavity. Regrettably, the accounts of these techniques are so ingenuous that one suspects there may be a high proportion of recurrent disease following this type of operation.

Combined-approach tympanoplasty requires elimination of disease with preservation of the bony meatal wall and avoidance of an exteriorized mastoid cavity, with reconstruction of a drum in the normal anatomical position. The written descriptions of drum repair and ossicular reconstruction techniques are, for the most part, clear and are easily followed. Little, however, has been said in recent papers on the technical problems arising out of the complete eradication of disease, especially where it occurs in the junctional "blind spot" between the middle ear and mastoid antrum, and in the posterior recesses of the meso and hypotympanum. We would hasten to add that two authors (Jansen, 1963; Sheehy, 1965) have described their techniques in considerable detail, but unfortunately their teaching has not been widely disseminated or understood. It is our purpose to attempt to draw greater attention to the problem of elimination of disease, with particular reference to the technique of posterior tympanotomy (Jansen, 1966). Posterior tympanotomy consists of opening the facial recess from its mastoid aspect and extending the exposure inferiorly to permit whatever access to the hypotympanum is necessary for the removal of diseased tissue.

The facial recess extends backwards and upwards in conical fashion from the postero-superior quadrant of the mesotympanum. Its bounds are laterally the chorda tympani and the postero-superior quadrant of the annulus; basally, the long process of the incus, the posterior crus of the stapes, the stapedius tendon and the pyramid; and medially, the genu and

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upper descending part of the VIIth nerve. The apex of the recess extends for a varying distance into the bone deep to and below the fossa incudis.

Historically, the facial recess was previously important in the early tympanoplasty era when Wullstein (1956) described a burr hole through which part of the recess could be inspected. Later, in a different context, Lewis (1956) described his method of exposing the genu and upper vertical segment of the facial nerve by first opening the facial recess through a mastoid approach. The importance of the facial recess in tympanoplasty has been continually emphasized in the teaching courses held by Dr. Howard House and his associates. Recently, Gibson *et al.* (1965) using the term "tympanic sinus" as an alternative for the facial recess, have reiterated the necessity to control this area.

Procedure

Ability to control the facial recess and hypotympanum by posterior tympanotomy is the sine qua non of combined-approach tympanoplasty. As already stated, it is our main concern in this paper to draw attention

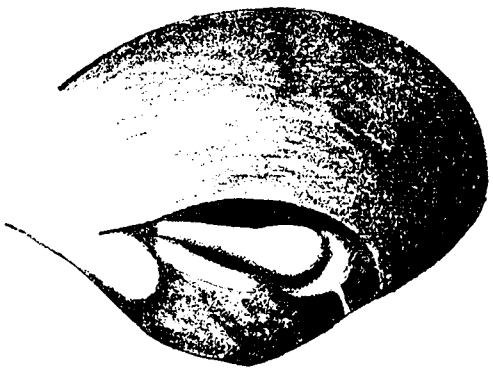


FIG. 1.
Extended mastoidectomy exposure showing the head of malleus, the short process and body of incus in the attic.

to the importance of posterior tympanotomy and to describe how the facial recess can be simply and safely exposed. In combined-approach tympanoplasty whenever the disease cannot be controlled through the meatus, then the mastoid antrum is uncapped and bone removed until the mastoid air cells are cleared of diseased mucosa and cholesteatoma. Further removal of bone is then continued in an anterior direction to open the epitympanum and expose the short process and body of the incus and the head of the malleus. The bone separating the trough thus formed and

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the external meatus is thinned from its superior and posterior surfaces until it is but a shell. The superior meatal wall, as it bends inferiorly on approaching the annulus, becomes more difficult to reach but access to its medial end is often improved by burring down the squama which forms the upper margin of the excavated trough till the dura is exposed. It is now advantageous to reposition the microscope so that it is directed downwards from the vertex to get the best view of the junctional area between the attic and mesotympanum. Thus far go most of the written descriptions of this part of the operation. Unless further work is done in this region to expose the facial recess, it is certain that irreversible pathology will be left behind in a high proportion of cases. Only Jansen and Sheehy describe their technique of opening the facial recess in sufficient detail to give practical assistance.

So far the attic and its contents have been widely exposed by thinning down the meatal wall from its upper and postero-superior aspects. The next step is to thin down the posterior meatal wall and then remove the bone which overlies the facial recess postero-laterally. The most useful

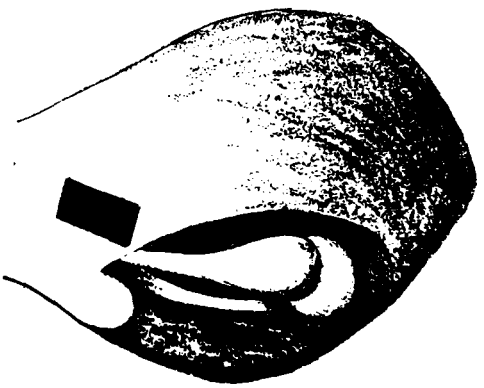


FIG. 2.
Black marker on bone overlying facial recess.

landmark is the short process of the incus and the fossa incudis. Using a $2\frac{1}{2}$ mm. burr, the bone immediately lateral to the fossa incudis is removed in an antero-inferior and medial direction until the facial recess is opened. Once an initial entry is made into the recess, enlargement can be carried out in all directions, but especially towards the hypotympanum so that a triangular aperture is formed. Constant visual reference is made to the position of the VIIth nerve in its horizontal course and as it lies medial to the burr. A diamond paste burr is preferred for the removal of bone

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immediately overlying the facial nerve. The facial recess is open once the stapes, the round window and the pyramid are in clear view, but further removal of bone in an inferior direction may sometimes be necessary to reach hypotympanic disease. It is important to note that this procedure avoids damage to the postero-superior annulus, an important consideration since loss of this part of the annulus would frequently lead to formation of a retraction pocket. Obviously a sound knowledge of the anatomy of the VIIth nerve based on dissection of anatomical specimens is essential before this procedure can be undertaken with safety.

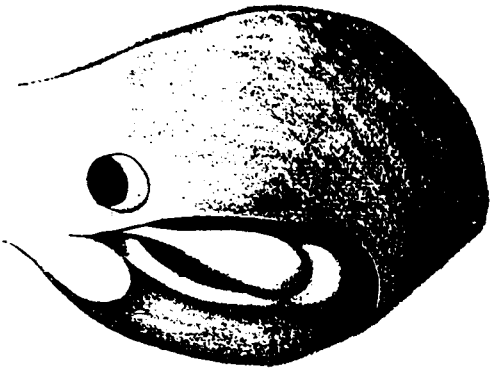


FIG. 3.
Burr hole into the facial recess.

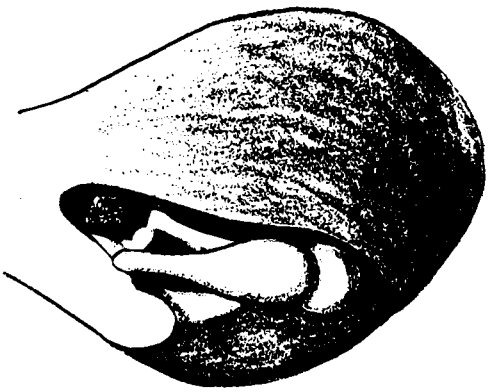


FIG. 4.
Further removal of bone to expose facial recess widely enough to view the long process of the incus, stapes and round window.

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Posterior Tympanotomy

It is now possible, having completed the transmastoid and transmeatal parts of the operation to see the course of the facial nerve throughout its horizontal and upper vertical parts. In addition, the promontory, the oval window and the round window will be visible from two separate directions. There is no longer any dead angle between the transmastoid and transmeatal aspects and the variable posterior areas of the middle ear are controlled. Such an exposure should enable the surgeon to clear diseased tissues from these areas with certainty, and complete the operation by reconstruction of a sound conduction mechanism.

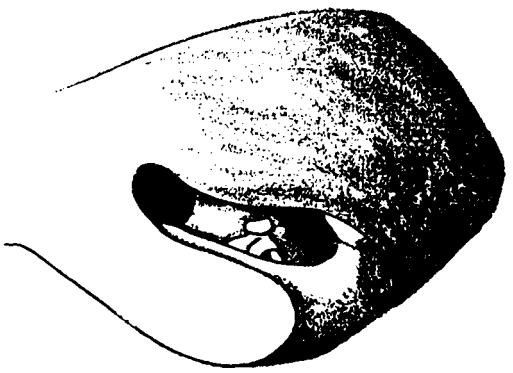


FIG. 5.
After removal of the incus, the facial nerve and hypotympanum are accessible.

Results

In our last 450 tympanoplasties (followed up from 6 months to 5 years) where an open mastoid cavity has been avoided, it has been necessary to open the facial recess on 198 occasions. In only three of these 450 cases has there been recurrence of cholesteatoma (this excludes seven cases where squamous retraction pockets formed in annular notches—a problem which will be dealt with in a later communication).

Acknowledgments

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