

Management of retraction pockets of the pars tensa

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Abstract

A study of 73 patients with retraction pockets of the pars tensa (93 affected ears) has been carried out. Of these 32 per cent had otalgia and 31 per cent reported episodes of aural discharge. Adequate audiometric data was available on 75 ears. Mean air-bone gaps were calculated using 500 Hz, 1000 Hz, 2000 Hz and 4000 Hz. Thirty per cent of ears had air-bone gaps of less than 10 dB and in 93 per cent the air-bone gap was less than 30 dB. Air-bone gaps of more than 40 dB were found in seven per cent. Of this group, seven patients were selected for surgical treatment. In all cases the retraction pockets were elevated and everted. In six cases, the thinned tympanic membrane was reinforced with a composite graft of cartilage and perichondrium. This technique has also been used in three patients not included in this study group. An ossiculoplasty was performed in four cases. In the early months, the retraction pockets remained completely everted. However, by 12 months some degree of retraction had recurred in four of the six patients who have been followed for more than 12 months.

Introduction

Retraction pockets of the pars tensa are relatively common findings in patients with previous ear disease, notably otitis media with effusion (OME) (Sade, 1979). Sade (1979) has classified them into four stages or grades (Fig. 1). It is not always easy to differentiate between grades 3 and 4 clinically, but movement of the retracted membrane on pneumatic otoscopy confirms grade 3. Thinning of the involved area of tympanic membrane occurs, with loss of the collagenous middle layer.

In contrast to attic retraction pockets, those in the pars tensa generally have wide necks and are usually self cleansing (Sade, 1979). However, in some cases epithelial debris accumulates within them and they may be a precursor of pars tensa cholesteatoma (Tos, 1987).

Many patients with this type of drug pathology require no treatment and, especially in the case of grade 4 retractions, they are difficult to treat successfully. Some may benefit, at least temporarily from the use of ventilation tubes (Palva, 1963; Sirala, 1963), but in some instances the placement of a tube through a thinned membrane may simply convert it into a sizeable perforation. Palva (1963) has advocated a tympanotomy with mobilization of the tympanic membrane, if necessary, prior to tube placement. An alternative approach is to provide an air reservoir to improve middle ear ventilation, by carrying out a cortical mastoidectomy (Arnvig, 1963; Grahne, 1964). This can be combined with placement of a ventilation tube (Siralva, 1963).

These approaches are based on the premise that retraction of the tympanic membrane is due to poor eustachian tube function and can be corrected by improving middle ear ventilation. While tubal dysfunction is an important part of the pathogenesis of such problems, it

does not follow that all such cases have an on-going Eustachian tube problem. In some cases the process may have been initiated by childhood otitis media, in association with age related tubal hypofunction, but perpetuated by the damage done to the middle ear during this

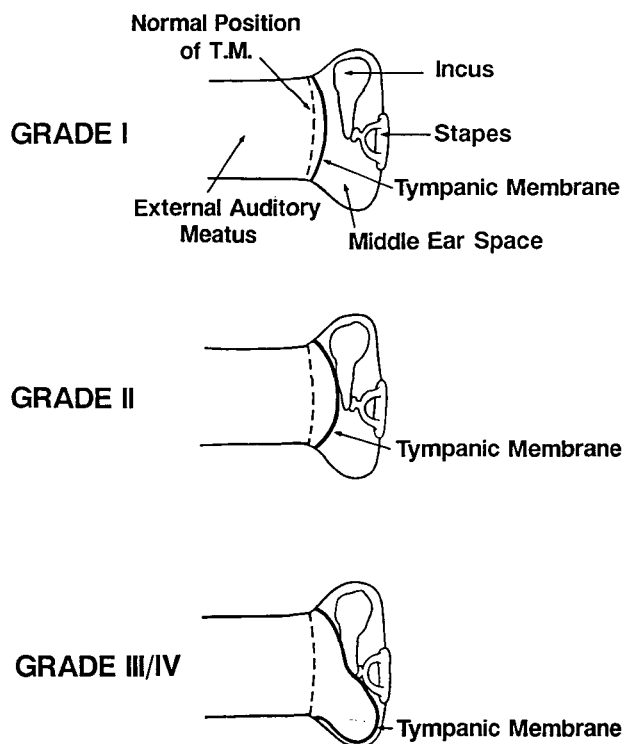


FIG. 1

Classification of retraction pockets of the pars tensa proposed by Sade.

period. In addition, the loss of the middle layer of the drum is a problem which will not be alleviated by middle ear ventilation. It can be alleviated by reinforcement of the drum with a graft of, for example, temporalis fascia. Recurrent pockets can be made shallower and wider necked by reduction of the bony annulus with a burr at the same time. Others have advocated excision of the thinned segment, the resulting perforation being left to heal. Glasscock *et al.* (1987) has described an alternative technique in which a composite graft of cartilage and perichondrium is used to stiffen the drum. This has particular appeal, because areas of drum in which tympanosclerosis are found are hardly ever retracted.

This paper describes the morbidity associated with retraction pockets of the pars tensa and discusses the use of the cartilage/perichondrium grafts described above in a small series of such cases.

Materials and methods

1) Patient survey: All patients with retraction pockets of the pars tensa, of grades 2, 3, and 4, seen by the author during an 18 month period were included in the study. In some cases the patients were referred to the clinic because of symptoms directly related to the drum retraction, while in others the findings were incidental. Patients were questioned about otalgia and aural discharge. The tympanic membrane was examined using a pneumatic otoscope in all cases and in many this was supplemented by further assessment using the operating microscope. The degree of retraction was recorded using the Sade classification. Retractions were classified as grade 3 if the drum was mobile on pneumatic otoscopy, and grade 4 if it was not. The site of the retraction was recorded using the four quadrant scheme presented in Figure 2. This system is used in our department to record various types of drum pathology and facilitates computerization of the data. Particular note was taken of the condition of the ossicular chain as observed through the thinned drum membrane. Cases were classified as either having a myringo-stapedioplasty ('natural type 3 tympanoplasty') or as having no evidence of such an arrangement. In many cases within the latter group it was possible to see that the incudo-stapedial joint was intact through the thinned drum membrane, but in others its condition could not be assessed. Whenever possible an audiogram including air conduction and masked bone conduction thresholds was obtained. The mean air-bone gap was determined using the frequencies 500 Hz, 1 KHz, 2 KHz and 4 KHz.

2) Surgical treatment: In selected cases, retraction

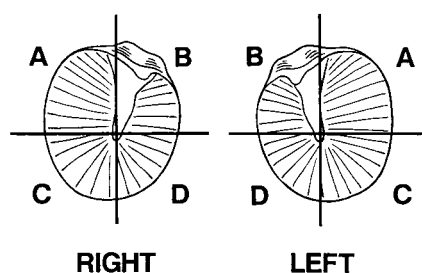


FIG. 2

Scheme for recording the site of tympanic membrane retractions.

pockets were treated surgically using a composite graft of tragal cartilage and perichondrium. The surgery was carried out under general anaesthesia, using an endaural incision. The graft was obtained, either via an extension of this incision on to the medial aspect of the tragus or via a separate incision at the base of the tragus. Cartilage and perichondrium were excised together and the cartilage was then trimmed back leaving the perichondrium so that the graft with cartilage in the middle and perichondrium alone at either end was produced (Fig. 3). A tympanomeatal flap was then raised and the retraction pocket was everted by careful dissection. Care was taken to avoid leaving an area of squamous epithelium within the middle ear space. If appropriate, an ossiculoplasty was then carried out and the composite graft was introduced as an underlay. A disk of 'Spongostan' (Johnson & Johnson) was placed over the tympanic membrane and a 'Pope Otowick' (Xomed) was introduced into the external meatus and saturated with 'Sofradex' (Rousell) ear drops. This was left *in situ* for five days. A head bandage was applied for 24 hours.

Results

1) Patient survey: Seventy-seven patients with 93 involved ears (51 right, 42 left) were seen during the study period. Twenty-seven were male and 50 were female and their ages ranged from 6 to 88 years (mean = 39 years). Grade 2 retractions were the commonest type, accounting for 68 per cent of the group (grades 3, 16 per cent; grade 4, 16 per cent). The distribution of retraction was classified into eight groups. Ninety-three per cent of cases fell into one of three groups and these are presented in Figure 4. Of the remainder, two patients had retraction involving quadrants A and B, and one each had involvement of quadrants A+C+D, A+C+B, B+D, and D alone. The incidence of ear symptoms is presented in Table I. Thirty-nine ears (36 patients) had spontaneous myringo-stapedioplasties visible. Of the remainder, 21 ears had a visible intact incudo-stapedial joint, while the rest either had absence of the stapes arch or ossicular chains which could not be viewed through the drum. Figure 5 presents the distribution of mean air bone gaps for the whole group, while in Figure 6 the hearing findings for patients with myringo-stapedioplasties are shown.



FIG. 3

The cartilage and perichondrium graft used for drum reinforcement.

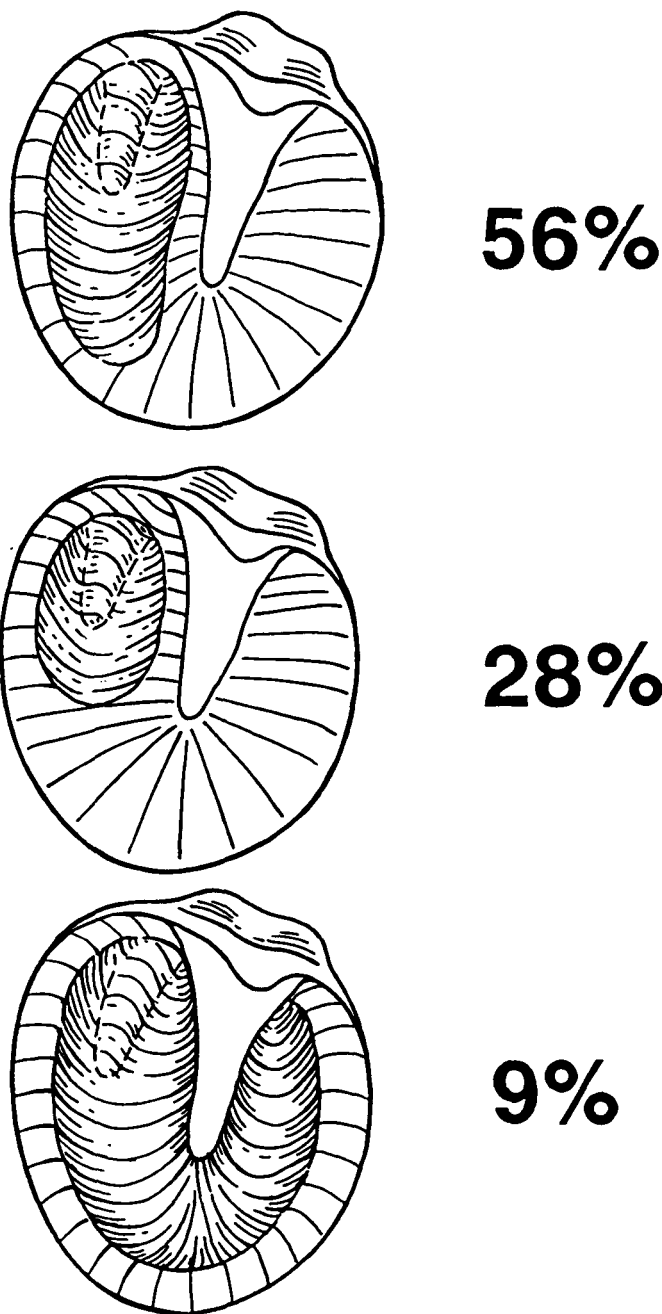


FIG. 4

The three commonest patterns of drum retraction observed in the patient survey.

2) Surgical treatment: Of the 77 patients described above, only seven were considered suitable for surgical treatment. In four cases the main indication was troublesome recurrent discharge, in the two it was hearing loss and in one it was hearing loss and otalgia. In six cases the

TABLE I

INCIDENCE OF EAR SYMPTOMS IN PATIENTS WITH RETRACTION POCKETS OF THE PARS TENSA

History	Number of ears	(%)
Asymptomatic	48	(52)
Symptomatic	45	(48)
Otalgia	30	(32)*
Discharge	29	(31)*

*14 patients reported more than one symptom in the same ear.

composite graft of cartilage and perichondrium was used. In the remaining case temporalis fascia was used to reinforce the thinned drum. Three additional patients, who were not included in the study population described above, have also undergone drum grafting of this type. One of these was having the second stage of an intact canal wall mastoidectomy, one was having a tympanoplasty and the other was undergoing revision of a mastoid cavity. All three had retraction of the posterior part of the tympanic membrane. In four cases an ossiculoplasty was performed, using the patient's own incus. In a further case a defect of the long process of the incus was identified but not corrected, as the patient had indicated that she was unconcerned about her hearing. In fact this patient obtained a useful, though unexpected, hearing gain (1 year: mean post-operative air-bone gap 5 dB, mean residual hearing loss 22 dB). At one year, none of the four patients who complained of recurrent discharge had had any further otorrhoea. In the early months all the retraction pockets remained everted with the drum in a physiological position. So far six of the nine patients who underwent operations using cartilage and perichondrium have been followed for 12 months or more. The findings at 12 months in these patients are presented in Table II. The results indicate a marked tendency for the pockets to recur. However, in one case the pocket has remained completely everted for over two years.

Discussion

In the present study, the commonest area of the drum to be affected by retraction was the postero-superior quadrant. This finding is in contrast to the results reported by Sade (1979) who found that retraction of all four quadrants of the drum was the commonest pattern observed. In the present study, most of the patients had been referred to the outpatient clinic for complaints not directly referable to their retraction pockets. It is possible that the patients in Sade's study were a more highly selected group. It is of some interest to speculate why the posterior portion should be most susceptible to such changes. It may be that this finding is related to the fact that this part of the drum is further away from the Eustachian tube than the anterior part of the drum. Alternatively it may relate to the distribution of forces within a retracted drum. The fact that ventilation tubes are

DISTRIBUTION OF MEAN AIR/BONE GAP (whole group)

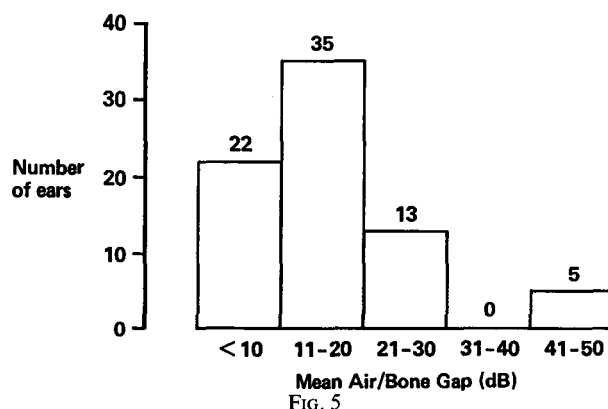


FIG. 5 The distribution of mean air-bone gaps for the whole study group.

DISTRIBUTION OF MEAN AIR/BONE GAP

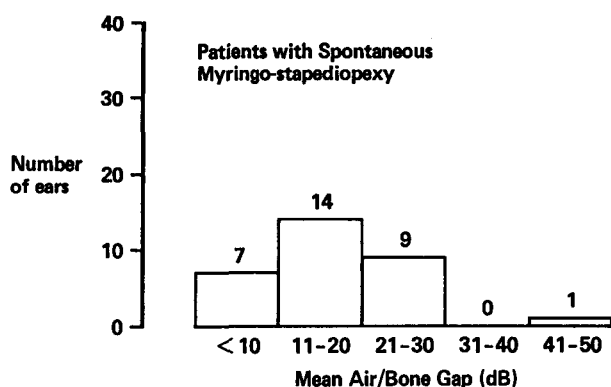


FIG. 6

The distribution of mean air-bone gaps for the patients with spontaneous myringo-stapedioplasties.

usually placed antero-inferiorly suggests that their use cannot be blamed for the formation of the majority of pars tensa retractions. The symptoms described in this study were elicited by direct questioning and may not have been of much consequence to the patient. It is likely that aural discharge was directly related to the observed drum pathology, while in many cases otalgia was probably related to Eustachian tube dysfunction, rather than to the retraction pocket itself. The four surgical cases were the only ones with frequent recurrent discharge. The majority of patients with retraction pockets of the pars tensa have relatively minor ear symptoms and do not require surgical treatment.

There was considerable variation in the degree of conductive loss experienced by patients in the study group. Some had minimal or absent air bone gaps, while others had quite a marked conductive element to their hearing losses. This variation was also seen in the subgroup with myringo-stapedioplasty. This may well be due to variations in stapes mobility, though other factors may influence the efficiency of such an arrangement. Experience has shown that some patients with significant conductive hearing losses despite having a spontaneous myringo-stapedioplasty do sometimes benefit from an ossicular reconstruction.

The early results obtained using the cartilage/perichondrial graft were encouraging, but there appears to be a progressively increasing recurrence rate for drum retraction as time passes. None of the patients who had recurrent discharge prior to surgery have had any post-operatively, despite the fact that three out of four have some recurrence of their drum retraction. At the outset of this investigation the author felt that eversion of the pocket would prevent recurrence of the discharge by facilitating migration from that area of the drum. It may be that, although retraction recurs, the new pocket remains self cleansing either because it is shallower or allows adequate migration for some other reason. Alternatively it may simply be that the epithelium which

Key words: Tympanic membrane; Otitis media

TABLE II
RESULTS OF CARTILAGE TYMPANOPLASTY AT ONE YEAR

Case number	Grade of drum retraction	
	Pre-op	1 year
1	3	3
2	4	2
3	4	2
4	4	0
5	2	2
6	4	0

forms during the healing process is healthier than that which was present pre-operatively. In some cases troublesome pockets have granulations within them and these can be excised during the surgery. The results suggest that ongoing Eustachian tube dysfunction is a feature of many of these cases.

The surgical results presented above could probably have been achieved using a temporalis fascia graft instead of cartilage and perichondrium. This has led the author to change to partial excision of the tympanic membrane without primary grafting in such cases. The early results with this technique are encouraging but must be viewed with extreme caution. These patients, together with those described in this paper will be closely monitored to determine the long-term outcome.

Acknowledgements

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