CLINICAL RECORDS

CHOLESTEATOMA FOLLOWING STAPEDECTOMY

By B. D. BIRT (London)

THE more important complications of stapedectomy are held to be those due to inner-ear damage. Other complications do, however, occur and these include otitis media, facial palsy, cerebrospinal fluid otorrhoea and meningitis (Shea, 1963; Rutledge, Lewis and Sanabria, 1963; Pinel and Richard, 1964). Bull (1965) has investigated the effect of sectioning the chorda tympani. Necrosis of the long process of the incus has been described (Alberti and Dawes, 1961; Smith, 1962) and there has been one report of massive operative haemorrhage thought to originate from the jugular bulb (Vergés-Llardent and Roca De Viñals, 1964). Several authors have described the development of granulomatous polyps in the oval window region, usually discovered when the ear was re-explored because of recurrence of deafness following fat graft stapedectomy (Harris and Weiss, 1962), extensive drill cuts (Scheer, 1962), or gel sponge implantation (Pratt and Winchester, 1962). This report describes the finding of a cholesteatoma in the middle ear 21 months after a fat graft stapedectomy.

Case Report

Mrs J.P. was first seen at the Royal Ear Hospital, University College Hospital in 1955. She complained of gradually increasing deafness since 1939 and a diagnosis of otosclerosis was made. Following a successful left fenestration, which was re-opened in 1961, she underwent a right stapes mobilization in 1962. A standard Rosen approach was used and some bone from the posterior superior meatal wall removed with the drill and curette. The tympanic membrane was slightly torn. A mobilization procedure was carried out and gel sponge placed on the defect in the tympanic membrane which healed perfectly. Although she experienced vertigo for 2 days post-operatively there was no change in her hearing, and it was considered justified to proceed to a right stapedectomy which was undertaken 5 months later in *February 1963*. A Rosen approach was again used. There was considerable fibrosis in the middle ear and more bone was drilled out of the meatal wall. The long process of the incus was identified and cleaned of adhesions. The stapes superstructure was removed and a narrow solid footplate found which had to be drilled out. A Shucknecht wire fat prosthesis was inserted using fat from a small incision in the lobe of the ear. Gel sponge was placed over the incus and the tympanic membrane replaced.

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She recovered uneventfully and thought that her hearing had improved. One month post-operatively an audiogram confirmed 20–40 db. improvement and the tympanic membrane appeared healed. However, over the next 2 months deafness and tinnitus developed and in *May 1963* an audiogram revealed air and bone thresholds of 80 db. or worse. The tympanic membrane appeared normal and there had been no vertigo, pain or otorrhoea. An inner ear loss was presumed. She was seen again in *July* and *January 1964* when her hearing and the appearance of her right tympanic membrane remained unchanged. However, when she attended in *November 1964* examination of the right ear revealed a pearly white rounded swelling occupying the posterior part of the tympanic membrane (Fig. 1). Thin blood vessels coursed over it, and slight movement

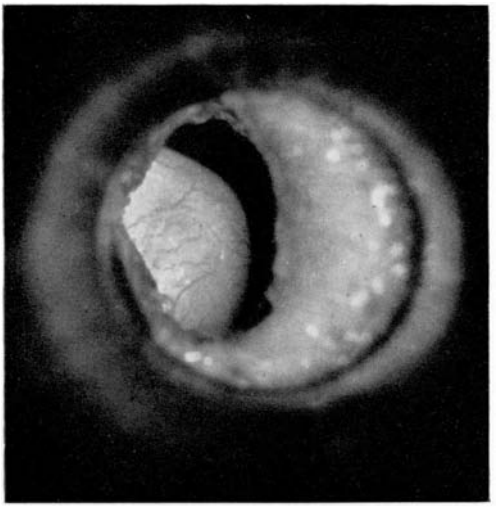


FIG. 1.
The appearance of the tympanic membrane.

occurred with vigorous use of the Siegle speculum. The meatus itself was quite normal up to the tympanic ring. There appeared to be no hearing in the right ear. It was thought that the appearances would be explained by a cholesteatoma in the middle ear and in *December 1964* a right tympanotomy was performed by the author. A Rosen incision was made and the stretched tympanic membrane peeled forward off the swelling. It was found that the middle ear as far forward as the malleus was occupied by a typical cholesteatoma which was dissected out and removed (Fig. 2). The entire long process of the incus had been eroded, and the wire strut from the previous operation lay in the middle ear with its foot buried in fibrous tissue at the site of the oval window (Fig. 3). This was left undisturbed and the tympanic membrane replaced. Following this operation she had no vertigo. Air and bone conduction studies again revealed absence of

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any hearing in that ear. Microscopy of the material removed from the middle ear revealed plaques of keratin. She has remained well and 6 months later her ear presents a normal appearance.

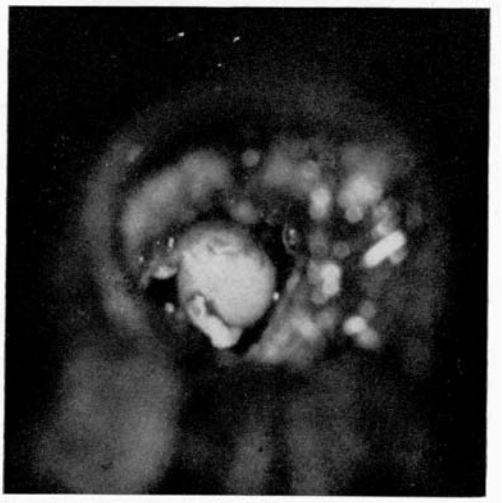


FIG. 2.
The cholesteatoma partly dissected.

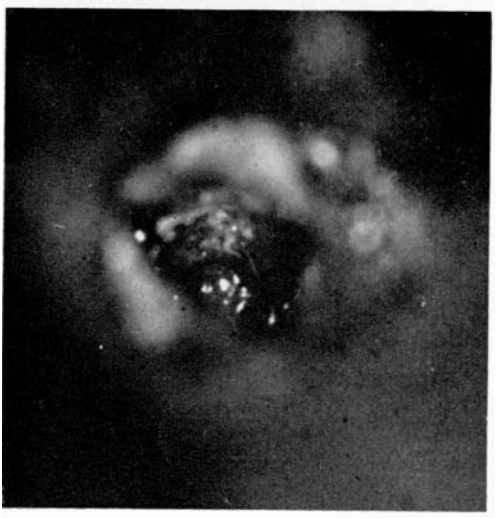


FIG. 3.
The oval window niche showing the wire prosthesis *in situ*.

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Discussion

It is not intended here to review the current theories of spontaneous cholesteatoma formation. However, Colman (1960) has described vividly the development of epidermoid cysts in the middle ear following experimental sealing of the oval window with thin split skin grafts, and it seems probable that this patient's cholesteatoma developed following the implantation of epithelial elements at the time of the second operation on her right ear. It has been expected that such a sequence could occur. In an article discussing cholesteatoma genesis in general Juers (1965) states: "There have been a few informal unpublished references to the development of cholesteatoma in ears subjected to tympanotomy for stapes surgery. This certainly serves as a warning to every otological surgeon to use utmost care to avoid dragging epithelial shreds into the tympanic cavity through the tympanotomy incision." Similarly House (1963) states that cholesteatoma cysts can develop in a tympanotomy incision if the edges are replaced inverted. However, the present cholesteatoma apparently developed deep in the middle ear and an alternative mechanism which seems at least a theoretical possibility is the inadvertent inclusion of squamous tissue within the fat graft itself. Harris and Weiss (1962) provide some support for this theory since they have described the microscopical finding of a giant cell system associated with keratin and a deep focus of squamous epithelium together with lanugo hair shafts in a normal looking fat graft plug removed from an ear they re-explored because of loss of hearing improvement. Clearly great care is required in cutting the fat graft plug if this type of stapedectomy is performed.

The association of cholesteatoma with stapedectomy prompts a degree of caution in advising operations on the second ear, except after an adequate interval. This case suggests an interval of at least 2 years and this is in agreement with the observation of King (1965) who found that the tendency for cholesteatoma to develop in skin graft tympanoplasties ceased after 2 years. A further point underlined by the present case is the need for post-operative follow-up examinations, particularly in those patients with a bad result, who are not able to develop the warning symptom of deafness should they develop a cholesteatoma.

Summary

A case is presented in which a cholesteatoma was found in the middle ear 21 months after a fat graft stapedectomy. Possible mechanisms causing the development of the cholesteatoma are discussed. It is suggested that after stapedectomy an interval of 2 years should be allowed before operating on a patient's other ear. The importance of follow-up examination is stressed, particularly in those patients whose stapedectomy has not been successful.

Acknowledgments

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