Eustachian tube surgery

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THE surgical approach to the bony part of the Eustachian tube is an extremely difficult procedure due to the regional anatomy. Zöllner (1963) has indicated the approach to the tube via an open mastoid cavity and it is the experience of many aural surgeons that at least the tympanic entrance of the bony part of the tube can be visualized in this way. In 1969, House *et al.* designed the middle fossa approach for Eustachian tuboplasty; however, this procedure seems not to be accepted for common use. The aim of this report is to draw attention to a combined postauricular transcanal approach which was used in one case for removal of a small piece of metal in the bony part of the Eustachian tube.

Report of a case

History. This 33-year-old male welder was referred to the hospital in March 1970, with a three-day history of drainage from his right ear and slight hearing loss. No past history of ear, nose and throat disease was obtained.

Findings. The patient had a purulent otorrhea from the right ear with a tympanic membrane perforation. The mucosa over the promontory was red and swollen. The hearing was impaired and the Weber lateralized to the right ear. The patient was then placed on antibiotic (penicillin V 800,000 IU) three times every eight hours for ten days. Two weeks later, the ear was rechecked. The patient had a dry central perforation without signs of infection. Radiographs of the ear showed a small piece of metal in the isthmus of the Eustachian tube as shown in Figure 1. The Eustachian tube function was tested according to deflation and aspiration methods. The measurement technique used has been described in a previous report (Holmquist, 1969). No tubal function was noted. Over a period of three months follow-up, the size of the perforation was unchanged. X-ray investigation of the Eustachian tube with contrast material via the perforation in the middle ear (Compere, 1960) still showed an X-ray dense piece of metal in the bony part of the tube (Fig. 2). Hearing tests with pure tone audiograms showed an air bone gap of 35 dB (Fig. 3). An operation was performed in June 1970, using a combined postauricular and transcanal approach.

Surgical procedure. Under general anaesthesia, a circular incision in the ear canal about 2–3 mm. from the annulus of the tympanic membrane was performed (Fig. 4a). Then a postauricular incision was made, exposing the mastoid cortex. The ear canal skin was elevated and displaced laterally. An anteriorly based tympanomeatal flap was raised and displaced posteriorly (Fig. 4b). In order to explore the bony Eustachian tube in its whole length it was necessary to remove a portion of the anterior bony meatus and also to remove the cortex of the mastoid partially as shown in Figure 4c. Now the whole length of the bony part of the Eustachian tube was visualized laterally and the small piece of metal was removed. The tympanic membrane and the ear canal skin were

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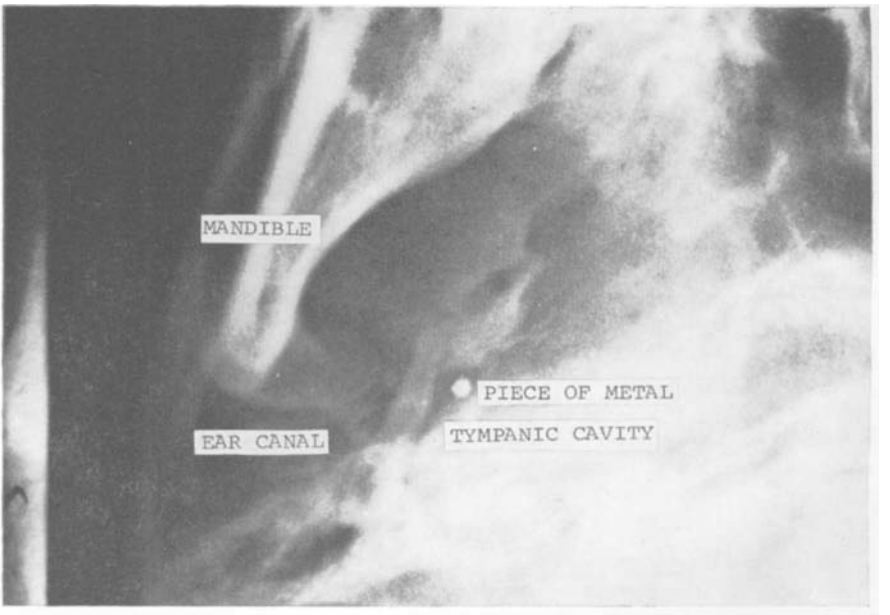


FIG. 1.
Radiogram (submento-vertex position) showing a small piece of metal in the Eustachian tube.

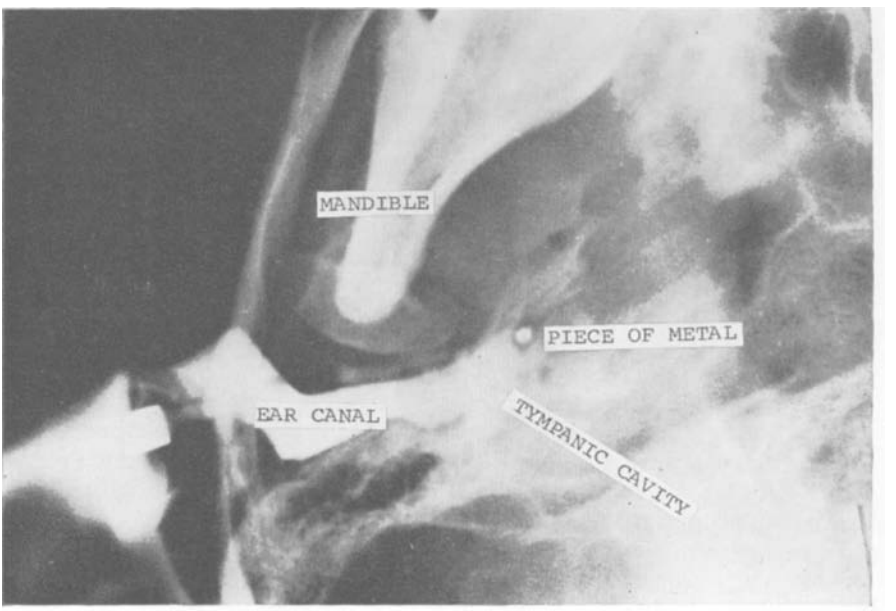


FIG. 2.
Radiogram with contrast material in the ear canal, tympanic cavity and bony portion of the Eustachian tube. Arrow indicates the small piece of metal.

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then placed in their original position and the ear canal packed with a pack soaked in a corticosteroid-antiobiotic solution (Terra-Cortril[R], Pfizer). The pack was removed two weeks later. Postoperatively, the ear canal skin healed and the perforation in the tympanic membrane was dry.

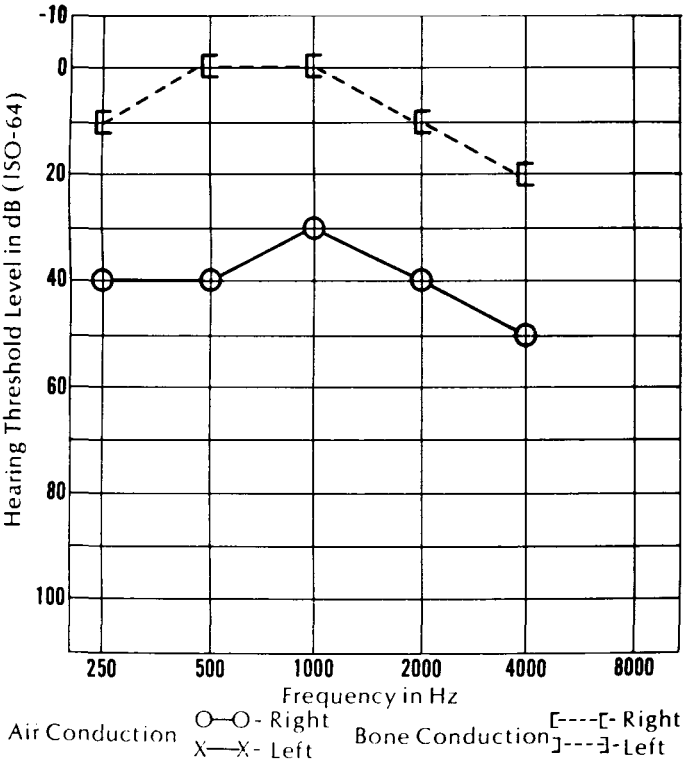


FIG. 3.
Pure tone audiogram showing an air bone gap of 35 dB.

Follow-up. Three months after the surgical procedure (September, 1970) the Eustachian tube function tests were found to be normalized according to the aspiration method (3), which means equalization of artificial intratympanic negative air pressure to zero-level upon swallowing. Seven months after the tubal surgery (January, 1971), myringoplasty was performed. It was successful, confirmed with otomicroscopy, and hearing tests were made three months later. The audiogram showed closure of the air bone gap to within 10 dB.

Comments. This case report will illustrate the possibility of reaching the isthmus of the Eustachian tube by using a combined postauricular and transcanal approach. It is obvious that the Eustachian tube must undergo surgical corrections in certain cases of chronic ear disease. When the osseous tube is severely blocked by bone or connective tissue, as reported by Schuknecht and Kerr in 1967, the procedure of choice must be surgical correction. The surgical

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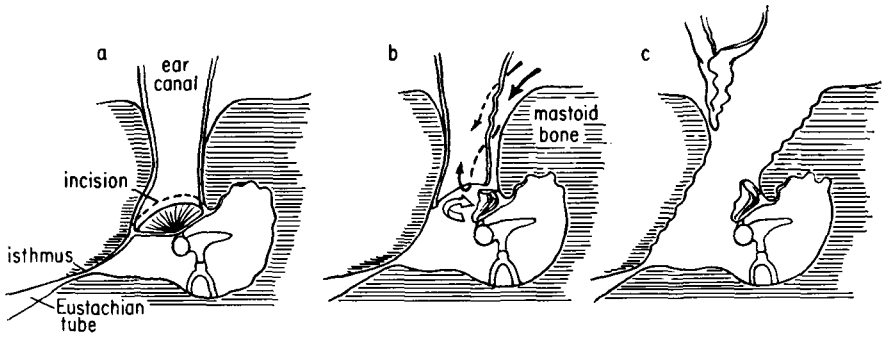


FIG. 4.
Schematic diagram of surgical approach to the bony part of the Eustachian tube.
a. Circular incision in the ear canal skin.
b. Postauricular incision to elevate ear canal skin laterally (dark arrows). Tympanoflap is displaced posteriorly (hollow arrows).
c. Ear canal skin has been elevated and pushed laterally. A portion of the anterior meatus and the cortex of the mastoid is removed with the drill.

procedure described may be a practical method of dealing with obstruction of the tube. It is easy to perform and in the case presented it was done within one hour. It is hoped that this report will stimulate surgical corrections of the Eustachian tube in cases of Eustachian tube blockage, confirmed with radiology and function tests (Ferber and Holmquist, in press).

Summary. A surgical approach to the bony part of the Eustachian tube is described. By using a combined postauricular and transcanal approach, it is possible to reach the isthmus of the tube. A case with a small piece of metal in the bony part of the tube was successfully treated with this approach which might be used in certain cases of chronic otitis media in order to correct blockage and malfunction of the Eustachian tube.

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