Intratympanic Membrane Cholesteatoma After Tympanoplasty With the Underlay Technique

Mohammad Nejadkazem, MD; Javad Totonchi, MD; Masood Naderpour, MD; Minoo Lenarz, MD

Objective: To evaluate the incidence of intratympanic membrane cholesteatoma (ITMC) in patients after tympanoplasty with the underlay technique.

Design: Retrospective study.

Setting: Ear, nose, and throat department, Tabriz University of Medical Sciences, Tabriz, Iran.

Patients: A total of 1121 patients with central tympanic membrane perforation were evaluated after tympanoplasty.

Interventions: Tympanoplasty was performed with the underlay technique using temporal facial graft.

Main Outcome Measure: The patients were followed up to assess the postoperative incidence of ITMC.

Results: During the follow-up period of 5 years, ITMC was observed in 9 patients (0.8%). Of these 9 patients, 8 were asymptomatic and had intact tympanic membranes. The asymptomatic cases were detected 1 to 2 years after surgery during routine follow-up examinations. Only 1 of 9 patients had otorrhea, which was due to a posterior perforation away from the location of the ITMC. The most common site of the ITMC was near the umbo.

Conclusions: Even after tympanoplasty with underlay technique, ITMC may develop between the layers of the tympanic membrane. The most common location of these cholesteatomas is near the umbo, which may be the result of insufficient removal of the residual squamous epithelium from the handle of the malleus. The cholesteatomas are usually asymptomatic and can be detected during routine follow-up examinations 1 to 2 years after surgery. Although ITMCs are usually noninvasive in nature, a review of the literature revealed that in rare cases they can also show a rapid and invasive growth pattern. Early detection and removal of these asymptomatic cholesteatomas during routine postoperative follow-up examinations can prevent their progression as well as consequent residual problems and complications.


HOLESTEATOMAS THAT ARE located between the layers of tympanic membrane are called intratympanic membrane cholesteatomas (ITMCs), which are categorized as congenital or acquired. The acquired type of ITMC is further subdivided into inflammatory and iatrogenic types.1-3 The iatrogenic type of ITMC can potentially occur after tympanoplasty, especially after tympanoplasty with an overlay technique or a combined overlay-underlay technique. Unfortunately, there are no clear reports in the literature about the incidence of these cholesteatomas after tympanoplasty with the underlay technique. In this study, we evaluated the incidence of ITMC in a series of 1121 patients with central tympanic membrane perforation who underwent tympanoplasty with the underlay technique and were followed up for 5 years after surgery.

METHODS

We retrospectively evaluated 1121 patients with central tympanic membrane perforation who underwent type I tympanoplasty with an overlay technique using temporal facial graft (with or without mastoidectomy). Patients with cholesteatoma and marginal perforation were not included. All 1121 patients received at least 5 years of follow-up. The follow-up examinations were performed 7, 21, and 60 days after surgery. Further follow-up examinations were performed every 3 months during the first 2 years, every 6 months during the third year, and then once a year during the fourth and fifth years.

RESULTS

Nine cases (0.8%) of ITMC were identified in 1121 patients (Table). Eight of the 9 patients involved were asymptomatic and had an intact tympanic membrane. The ITMC was detected during routine post-
operative follow-up examinations in all 9 patients. Only 1 of the 9 patients presented with otorrhea, which was due to a posterior perforation that was not related to the ITMC. In this case, the ITMC was located anteriorly and away from the perforation. In all 9 patients, the ITMCs were diagnosed between 13 and 22 months after surgery, and the most common location was near the umbo (6 cases). The average diameter of the ITMC at the time of diagnosis was approximately 2 mm.

Once the ITMC was detected, the patients were informed about the diagnosis, and removal under local anesthesia was planned. Eight patients with intact tympanic membranes and small cholesteatomas underwent surgery on an outpatient basis. A sickle knife was used to remove the cholesteatoma pearls from the tympanic membrane, with preservation of the intact medial layer. The diagnosis of ITMC was confirmed histopathologically in all cases. Recurrence was not observed during the 8- to 42-month follow-up period after surgery. In the only case with an anterior ITMC accompanied by a dorsal perforation and otorrhea, the patient was admitted to the hospital, and explorative tympanotomy and type I tympanoplasty were performed to rule out further cholesteatomas in the middle ear and to close the tympanic membrane perforation, which was not related to the ITMC.

The acquired form of ITMC may be caused by an inflammatory injury or surgery.1,10-11 Inflammatory injuries to the tympanic membrane may lead to the proliferation of the basolayer of squamous epithelium into protruding cones. In such cases, although microscopically the tympanic membrane is injured, macroscopically it appears intact. The cones then form cholesteatomas within the layers of tympanic membrane.2 Tympanoplasty is another important pathogenetic factor in acquired ITMC. The ITMC usually occurs after tympanoplasty with an overlay technique or a combined overlay-underlay technique.10,11

Our study revealed that an underlay tympanoplasty can also lead to the development of an ITMC, which occurs mostly near the umbo, where insufficient separation of the squamous epithelium rests from the handle of the malleus can be the responsible factor. The ITMC is often limited to the tympanic membrane and progresses very slowly and silently.1 Most of our patients did not have any symptoms, and their cholesteatomas were diagnosed during the second year after surgery; therefore, regular follow-up examinations after tympanoplasty are extremely important, even in asymptomatic patients, for a period of up to 2 years after surgery. In rare cases, ITMC may also show an invasive growth and invade the middle ear structures.2

Appropriate management of ITMC consists of early diagnosis and evacuation of the keratin while it is still small and before the endothelial layer of the tympanic membrane erodes. The operation can be performed on an outpatient basis with the patient under local anesthesia. If the ITMC is associated with other pathologic conditions, such as otorrhea or perforation, exploratory tympanotomy and revision tympanoplasty are required to rule out its progression to the middle ear and to repair tympanic membrane perforation.

Submitted for Publication: February 28, 2006; final revision received June 27, 2007; accepted September 4, 2007.

Correspondence: Mohammad Nejadkazem, MD, Department of Otolaryngology, Medical University of Tabriz, Suite 5, No. 5 S Sadri St, Valiasr, Tabriz Az 5157936513, Iran (nejadkazem@yahoo.com).

Author Contributions: Dr Nejadkazem had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Nejadkazem and Lenarz. Acquisition of data: Nejadkazem, Totonchi, and Naderpour. Analysis and interpretation of data: Nejadkazem and Totonchi. Drafting of the manuscript: Nejadkazem and Lenarz. Critical revision of the manuscript for important intellectual content: Totonchi and Naderpour. Statistical analysis: Nejadkazem and Totonchi. Obtained funding: Nejadkazem, Totonchi, and Naderpour. Administrative, technical, and material support: Nejadkazem and Lenarz. Study supervision: Nejadkazem.

Financial Disclosure: None reported.

REFERENCES