A case of a prolapsed facial nerve into the middle ear cavity

Introduction

This article reports a case of tumour-like prolapse of the tympanic segment of the left facial nerve into the middle ear cavity in an 11-year-old boy. An otoendoscopic examination revealed a yellowish cylindrical mass behind the intact eardrum that was in contact with the handle of the malleus and the posterior segment of the tympanic membrane. A hearing test showed a conductive hearing loss in the left ear at all frequencies with an air–bone gap of 60 dB. Surgery to improve the patient's hearing was not attempted because of the complete covering of the facial nerve over the oval window.

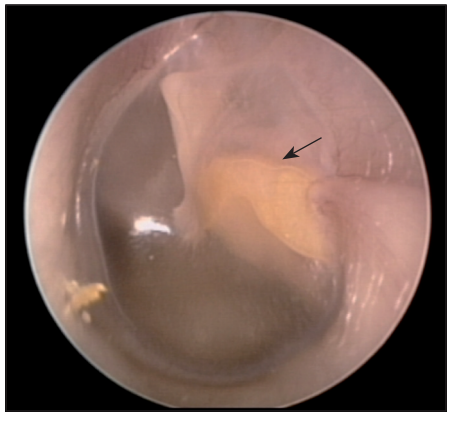
Discussion

Dehiscence of the tympanic facial canal is encountered commonly, especially during middle ear surgery (Di Martino et al, 2005; Shinnabe et al, 2013). Fallopian canal dehiscence is a well-known anatomical variation with or without cholesteatoma. The dehiscence may be a result of developmentally insufficient ossification of the bony canal surrounding the facial nerve as well as bone resorption associated with chronic otitis and particularly cholesteatoma (Ozbek et al, 2009). The highest incidence occurs in the tympanic segment of the facial nerve near the region of the oval window (Moreano et al, 1994).

Spector and Ge (1993) investigated the patterns and incidence of bony dehiscences within the tympanic fallopian canal segment in the fetal and neonatal temporal bones. They found that fallopian canal dehiscences are not congenital anomalies, but variations of normal developmental anatomical processes. Shinnabe et al (2013) showed that the lateral wall of the fallopian canal gradually thins with growth as a result of temporal bone pneumatization.

Preoperative evaluation of the fallopian canal by thin-section high-resolution computed tomography scanning of the temporal bone is necessary for safe surgical management. The combined analysis

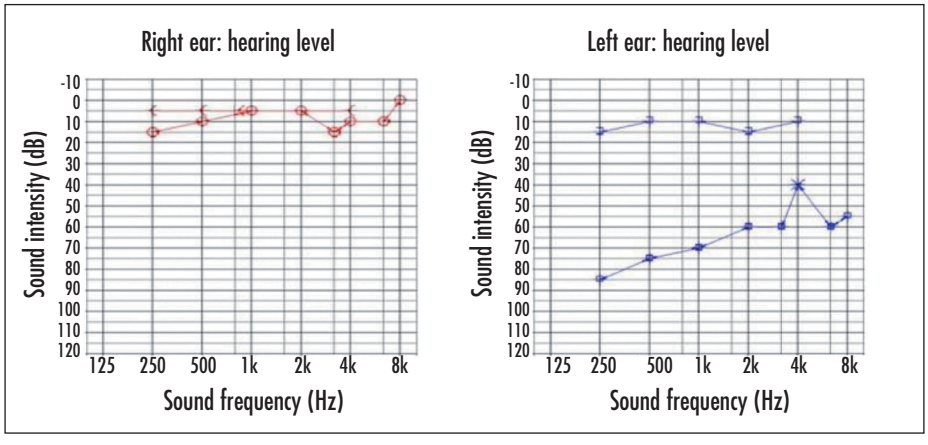
Figure 1. Otoendoscopic examination showed a yellowish cylindrical mass (black arrow) behind the left eardrum in contact with the handle of the malleus and the posterior segment of the tympanic membrane.



Professor Se-Hyung Kim *is Assistant Professor in the Division of Otology and* **Professor Jeong Hong Kim** *is Associate Professor in the Division of Rhinology, Department of Otorhinolaryngology, Jeju National University School of Medicine, Jeju 690-756, South Korea*

Correspondence to: Professor JH Kim (jeonghongkimmd@gmail.com)

Figure 2. A pure tone audiogram of the left ear revealed a conductive hearing loss at all frequencies with a threshold of 70 dB with an air–bone gap of 60 dB.



Case Report

An 11-year-old boy was referred to an otolaryngologist at a tertiary referral centre for hearing loss in the left ear which he had had for several years. He also complained of a feeling of fullness in the same ear. Otoendoscopic examination showed a yellowish cylindrical mass behind the left eardrum in contact with the handle of the malleus and the posterior segment of the tympanic membrane (*Figure 1*). A pure tone audiogram of the left ear revealed a conductive hearing loss at all frequencies with a threshold of 70 dB with an air–bone gap of 60 dB (*Figure 2*). Hearing in the right ear was normal.

High resolution computed tomography of the temporal bone demonstrated diffuse thickening of the tympanic segment of the left facial nerve with focal herniation into the middle ear cavity just posterior to the long limb of incus (*Figure 3*). On the basis of the clinical findings, he was diagnosed as having complete dehiscence of the fallopian canal with a prolapsed facial nerve into the middle ear cavity. Surgery to improve the patient's hearing was not attempted because of the complete covering of the facial nerve over the oval window. Regular follow-up has been conducted for the past 4 years, but left-sided conductive hearing loss continues to be his only symptom. The possibility of future complications of acute otitis media such as neuritis and facial palsy have been explained to the patient's parents.

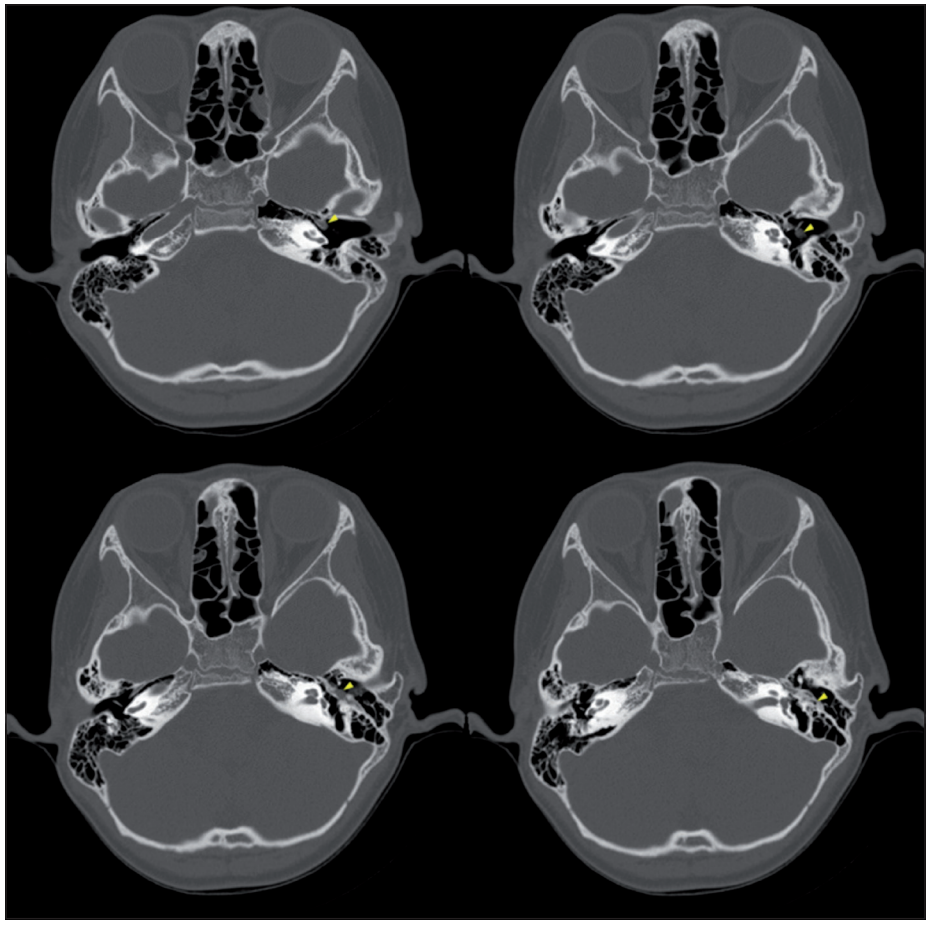


Figure 3. Computed tomography scan of the temporal bone demonstrated diffuse thickening of the tympanic segment of the left facial nerve with focal herniation into the middle ear cavity (yellow arrowheads) just posterior to the long limb of incus.

of axial, coronal and sagittal planes can increase the positive rate of diagnosis for dehiscence of the facial nerve canal (Yu et al, 2011). However, high-resolution computed tomography has a much greater radiation burden and sometimes young children will require anaesthesia for the scan.

This patient showed a conductive hearing loss. A possible explanation may be that both complete disconnection of the bony ossicles and the intact tympanic membrane are responsible for the significant air–bone gap.

A dehiscence of the fallopian canal can expose the facial nerve and render it vulnerable to damage. Such anatomical situations increase the risk of injury during routine otological surgery and general outpatient procedures in otorhinolaryngology. The lack of bony protection is a predilection for inflammatory nerve involvement such as neuritis and facial palsy in both acute or chronic suppurative otitis media and cholesteatoma (Bayazit et al, 2002).

Conclusions

Physicians should be aware of the possibility of facial nerve dehiscence in patients with abnormal lesions in the middle ear cavity behind the tympanic membrane who do not show any otological and neurological symptoms and signs.

Proper consultation with an otolaryngologist and a temporal bone computed tomography scan with a neuroradiology report is needed for early diagnosis and proper management. Physicians should be careful while performing office-based general procedures during the examination of these ears. If surgery is required for hearing improvement, it should be performed by experienced surgeons in otology. BJHM

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LEARNING POINTS

- The possibility of a herniated facial nerve should be considered in patients presenting with an abnormal lesion in the middle ear cavity behind the tympanic membrane despite not showing any otological and neurological symptoms and signs.
- Consultation with an otolaryngologist and radiologist is required for proper diagnosis and management.
- Temporal bone computed tomography is helpful for detecting dehiscence of the facial canal and necessary to ensure safe surgical management.
- If surgery is required, it should be performed by experienced otological surgeons.