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Cholesteatoma Mimicking Facial Neurinoma: A Case Report

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Abstract

We report herein a case of cholesteatoma of the right temporal bone that mimicked facial neurinoma. A 44-year-old woman complained of right facial nerve paralysis. Computed tomography (CT) scan showed a lesion along the right facial nerve of the labyrinthine and horizontal portion. The lesion widened to the right fallopian canal at that site. She underwent surgery and both surgical and histological findings were consistent with cholesteatoma. In contrast to the CT scan findings, which strongly suggested the lesion to be facial neurinoma, the diffusion-weighted magnetic resonance imaging (MRI) suggested cholesteatoma.

Introduction

Facial nerve schwannoma, or facial neurinoma, is an uncommon disease that accounts for less than 1% of temporal bone tumors [1]. The age of presentation reportedly varies. It occurs at all age ranges, from children to elderly, and no gender prediction is seen [1]. Facial neurinoma commonly presents with peripheral facial palsy and hearing loss (conductive or sensorineural) and occasionally dizziness, tinnitus, and other otologic symptoms.

Cholesteatoma is a mass composed of keratinizing epithelium occurring in the middle ear. Cholesteatoma can be divided into 2 types: acquired and congenital. The acquired type of cholesteatoma originates as an inward growth of the tympanic membrane. Cholesteatoma extending to the petrous portion of the temporal bone is relatively uncommon [2]. CT scan is usually used for preoperative diagnosis of the cholesteatoma. If the diagnosis is suspicious, magnetic resonance imaging (MRI) enhanced with Gadolinium (Gd) is often performed.

We report herein a case of cholesteatoma of the skull base of the middle cranial fossa. The lesion extended along the facial nerve and mimicked facial neurinoma.

Case Report

A 44-year-old woman presented with a history of mild right facial palsy (4 years) and right hearing loss (10 years). She had first noticed the mild facial palsy (House-Brackmann grade II) of the right side 4 years ago. Her facial palsy suddenly progressed (House-Brackmann grade III) one month before presentation at our hospital. She denied any history of right otorrhea and there was no history of ear pain or headache.

Physical examination of the right ear revealed a dry retraction pocket at the pars flaccida, and the left ear showed no abnormality. Pure tone audiometry showed mixed hearing loss of the right ear (Figure 1). Computed tomography (CT) scan of the temporal bone revealed a soft tissue
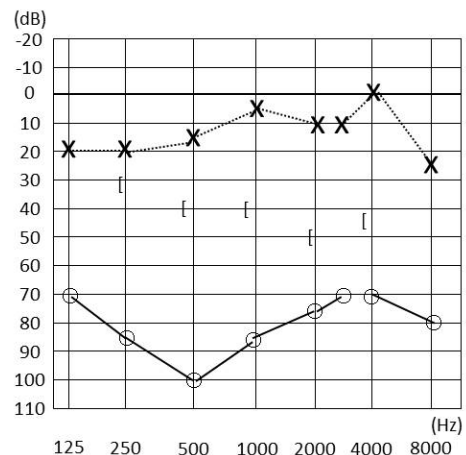

Figure 1. Pre-operative pure-tone audiogram. The audiogram showed mixed hearing loss of the right ear.

density along the right facial canal extending from the horizontal to labyrinthine portion (Figure 2). MRI showed the mass to be enhanced with gadolinium (Figure 3). Diffusion-weighted MRI detected the lesion as a high-intensity mass (Figure 4). Exploratory tympanotomy was done. Intraoperatively, a whitish mass was found along the right facial nerve after

Figure 2. CT scan of the right temporal bone. Facial canal was widened by the lesion (arrowhead).

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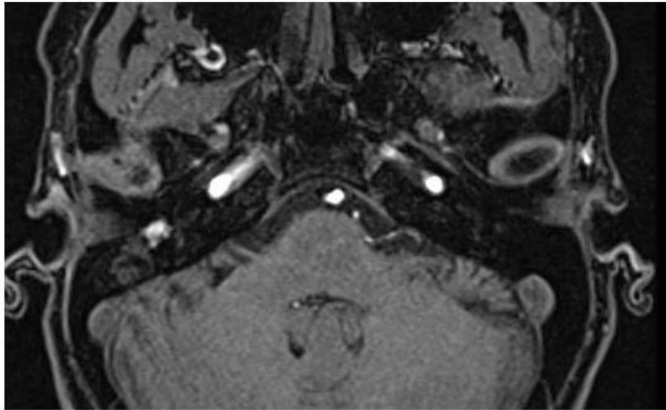Email: ktabuchi@md.tsukuba.ac.jp

Figure 3. Gadolinium-enhanced T1 weighted MRI. A part of the lesion was well enhanced by gadolinium.

drilling out the horizontal and labyrinthine portions of the nerve (Figure 4). All cholesteatoma lesion of the petrous bone was removed via translabyrinthine approach. The postoperative pathological findings were also consistent with cholesteatoma (Figure 5). The postoperative course was uneventful, but her facial palsy did not improve after the surgery.
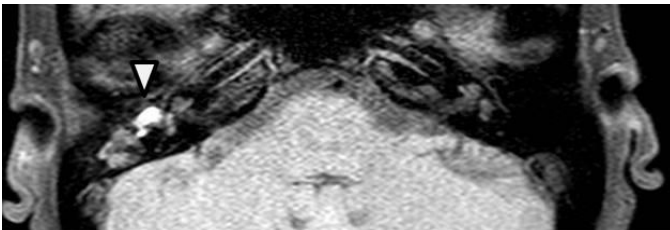

Figure 4. Diffusion-weighted MRI. The lesion was detected as a high-intensity mass (arrowhead).
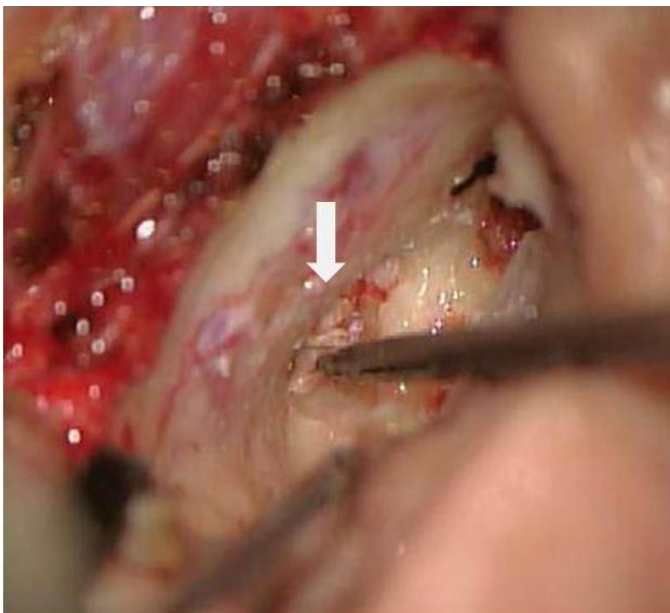

Figure 5. The operative finding. Whitish cholesteatoma pearl was noticed. The lesion was removed via translabyrinthine approach.

Discussion

The geniculate ganglion fossa is the most common location for facial nerve neurinoma [3,4]. They have reported that facial neurinoma originating in the geniculate ganglion fossa often shows extension to the tympanic and/or labyrinthine segments and that isolated involvement of the geniculate ganglion fossa at the time of the presentation is very rare. They emphasized that facial neurinoma should be suspected whenever a middle cranial fossa mass is associated with facial nerve dysfunction and/or otologic symptoms.

Our patient exhibited with facial weakness and hearing loss of long duration and both these symptoms were often present with facial neurinoma. The location of the disease, as detected by CT scan and MRI, strongly suggested facial neurinoma. CT scan showed that the lesion was extended along the facial nerve from the internal acoustic meatus to the horizontal portion, and the facial canal was widened at the portions. Gadolinium MRI showed that the lesion was well enhanced in some parts. These findings were often seen in facial neurinoma. However, the lesion showed high intensity with diffusion-weighted MRI finding that is often seen in cholesteatoma. The reason for the high signal intensity is assumed to be due to a T2 shine-through effect or due to the restricted molecular diffusion of cholesteatoma, although the real reason for the increased signal intensity on diffusion weighted imaging (DWI) is still unknown [5]. A recent meta-analysis study has shown that diffusion-weighted MRI is useful for detecting residual or recurrent cholesteatoma [6]. Pennaneach et al. described that the overall sensitivity and specificity for the post-gadolinium T1-weighted images were 63% and 71%, respectively, and 88% and 75% for the diffusion-weighted images [7]. They concluded that the diffusion-weighted MRI identified cholesteatoma lesions more reliably.

In conclusion, we reported a case of cholesteatoma that mimicked facial neurinoma. To avoid confusion in such cases, diffusion-weighted MRI may be useful in preoperative differential diagnosis.

Abbreviations
Gd, Gadolinium; CT, Computed tomography; MRI, magnetic resonance imaging; DWI, diffusion weighted imaging.

References
1. McMonagle B, Al-Sanosi A, Croxson G, Fagan P. Facial schwannoma: results of a large case series and review. The Journal of Laryngology and Otology 2008; 122: 1139-1150.
2. Moffat D, Jones S, Smith W. Petrous temporal bone cholesteatoma: a new classification and long-term surgical outcomes. Skull Base 2008; 18: 107-115.
3. Mundada P, Bela SP, Tiong YT. Imaging of facial nerve shwannomas: diagnostic pearls and potential pitfalls. Diagnostic and Interventional Radiology. 2016; 22: 40-46.
4. Lahlou G, Nguyenn Y, Russo FY, Ferrary E, Sterkers O, Bernardeschi D. Intratemporal facial nerve schwannoma: clinical presentation and management. European Archives of Oto-rhino-laryngology 2016; 273: 3497-3504.
5. Henninger B, Kremser C. Diffusion weighted imaging for the detection and evaluation of cholesteatoma. World Journal of Radiology. 2017; 9: 217-222.
6. Muzaffar J, Metcalfe C, Colley S, Coulson C. Diffusion-weighted magnetic resonance imaging for residual and recurrent cholesteatoma: a systematic review and meta-analysis. Clinical Otolaryngology 2017; 42: 536-543.
7. Pennaneach A, Garetier M, Ollivier M, Ognard J, Marianowski R, Meriot P. Diagnostic accuracy of diffusion-weighted MR imaging versus delayed gadolinium enhanced T1-weighted imaging in middle ear recurrent cholesteatoma: A retrospective study of 39 patients. Journal of Neuroradiology 2016; 43: 148-154.