The Journal of Laryngology & Otology (2006), ***120***, *247–249*.
© 2006 JLO (1984) Limited
doi:10.1017/S0022215106004427
Printed in the United Kingdom

Clinical Record

Schwannoma of the tympanic membrane

Chao-Hui Yang, MD, Chih-Ying Su, MD, Yu-Ching Wei, MD*, Chung-Feng Hwang, MD

Abstract

Schwannoma arising from the tympanic membrane is a rare neoplasm. This report describes an external ear canal mass obscuring the tympanic membrane. A transcanal approach identified a tumour adhered to the tympanic membrane. The tumour was excised without myringoplasty. Pathology confirmed the diagnosis of schwannoma. Clinical examination revealed no evidence of recurrence during a follow-up period of one year. The possible origins of schwannoma of the tympanic membrane and lesion management are also discussed.

Key words: Ear Neoplasms; Schwannoma; Tympanic Membrane

Introduction

Schwannomas arise from the Schwann cells of the peripheral cranial nerve. Schwannomas are typically benign and slow growing. Roughly 25–45 per cent of schwannomas occur in the head and neck region.[1] There are few reports identifying external auditory canal tumours as schwannomas; furthermore, most reports are for tumours arising from the ear canal. Only one report documented a schwannoma arising from the tympanic membrane.[2]

This case report is of a schwannoma completely obstructing the external ear canal, originating from the subepithelial tissue of the tympanic membrane. A literature review follows the case report.

Case report

A 70-year-old man arrived at our department complaining of left-sided otalgia of one month's duration. The patient presented with left-sided hearing impairment.

A clinical examination identified a pinkish mass in the patient's left auditory canal completely obstructing the canal (Figure 1). The tympanic membrane therefore could not be observed via the otoscope. Audiometry showed left-sided conductive hearing loss with a 25 dB air–bone gap. High-resolution computed tomography (HRCT) identified a nonenhancing, approximately 7 mm soft tissue mass in a medial section of the left external auditory canal, contiguous with the tympanic membrane (Figure 2). No obvious middle-cavity extension or bony erosion was noted. A biopsy found mucocutaneous tissue with keratinized squamous epithelium; thus, cholesteatoma was suspected.

The mass in the left external auditory canal was removed via a transcanal approach. The tumour was attached to the superior-posterior quadrant of the tympanic membrane and was excised en bloc. The outer epithelium of the tympanic membrane was removed at its attachment to preserve the remaining fibrous and inner endothelial layer. As only part of the outer epithelium of the tympanic membrane was removed, further myringoplasty was not performed. The eardrum healed completely within two weeks and there was no recurrence during a one-year follow up.

Gross examination revealed that the mass was ovoid-shaped with a smooth surface and was approximately $1.0 \times 0.6 \times 0.4$ cm in size. Microscopically, the tumour was composed of markedly palisading Antoni type A tissue with loose Antoni type B tissue (Figure 3). Immunohistochemical study was positive for S-100 protein. These pathology findings confirmed the diagnosis of schwannoma.

Discussion

Schwannomas are benign tumours that arise from the Schwann cells of nerve sheaths. Schwannomas may occur on any peripheral, cranial or autonomic nerve that has a Schwann cell sheath and are typically solitary, slow-growing, benign tumours. Schwannomas in the external ear canal are rare; only five cases have been reported in the English literature[2–6] since the first report[3] in 1993. Among these cases, only one arose from the tympanic membrane.[2]

In our case, the external ear canal mass totally covered the tympanic membrane, and identifying the relationship between the mass and the tympanic membrane was thus difficult. In such cases, it is necessary to use computed tomography (CT) or magnetic resonance imaging (MRI) to identify the degree of tumour extension to the middle ear, mastoid and internal auditory canal. Previous case studies have reported large acoustic neuromas presenting as tumours of the external auditory canal.[7,8] In our case, the mass found on temporal bone CT continued into the external auditory canal without invasion of the middle-ear cavity.

Previous reports have identified rare neoplasms as isolated tumours of the tympanic membrane; for example, cavernous[9] and capillary haemangioma,[10] schwannoma[2] and squamous cell carcinoma.[11] During pre-operative evaluation it is difficult to differentiate the schwannoma from other benign or malignant tumours. This difficulty may be eliminated by pre-surgery biopsy. However, deep

From the Departments of Otolaryngology and *Pathology, Chang Gung Memorial Hospital, Kaohsiung Medical Center, Taiwan.
Accepted for publication: 29 September 2005.

https://doi.org/10.1017/S0022215106004427 Published online by Cambridge University Press

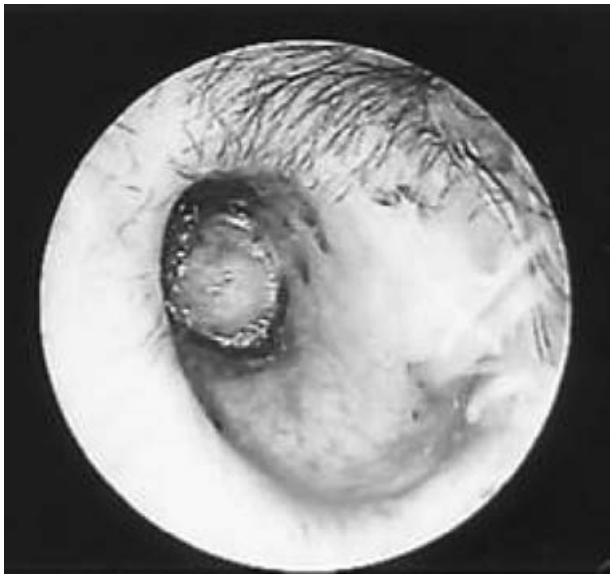

FIG. 1
A pinkish mass within the left external ear canal.

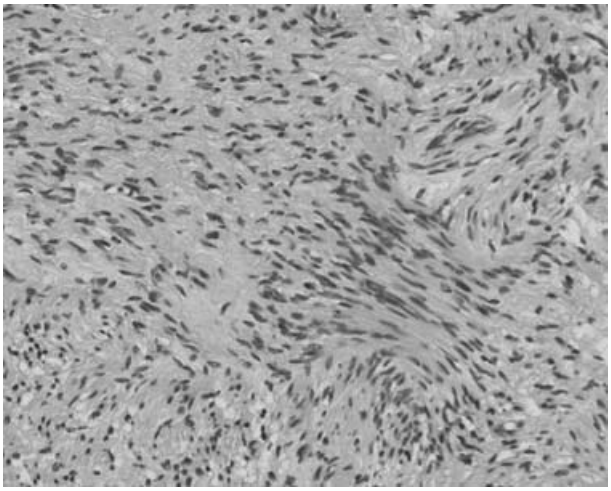

FIG. 3
Compact, elongated spindle cells arranged in a palisading pattern (Antoni A area) with less ordered arrangement of spindle cells in a loose stroma (Antoni B area) (H & E; ×200).

biopsy may induce bleeding from a vascular tumour. Conversely, a superficial biopsy of cutaneous epithelium may prompt a misdiagnosis of cholesteatoma, as was the case in our patient.

It is difficult to determine the nerve of origin for schwannoma of the tympanic membrane. Since the tympanic membrane is innervated by branches of the trigeminal, facial, glossopharyngeal and vagal nerves, it is challenging to identify the exact relationship between the schwannoma and its innervation. In our case, the schwannoma was attached to the superior-posterior part of the tympanic membrane; it was assumed that the auriculotemporal branch of the mandibular division of the trigeminal nerve was the most likely innervation as this nerve dominates sensation in the tympanic membrane.[12] However, due to the complex twigs of nerves in this area, the actual nerve of origin was hard to locate.

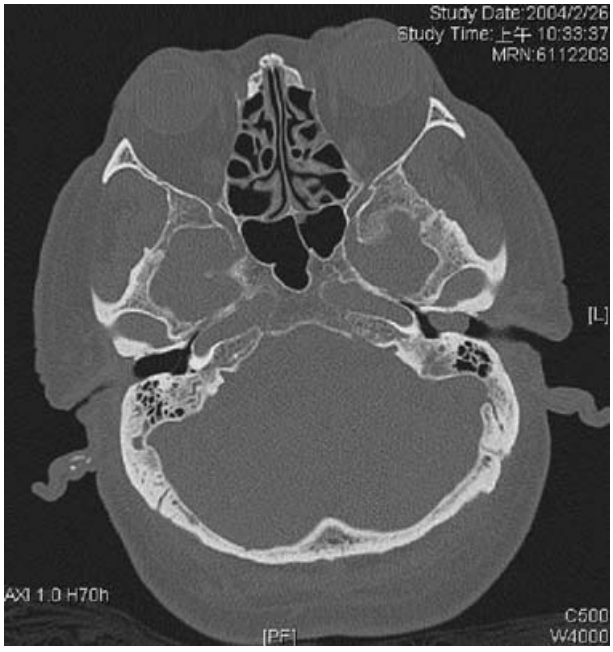

FIG. 2
A pre-operative high resolution computed tomogram of temporal bone, identifying a nonenhancing, approximately 7 mm soft tissue mass located in the medial part of the left external auditory canal, contiguous with the tympanic membrane.

In the only previously reported case, therapy for schwannoma of the tympanic membrane was surgical excision. Excision was performed via the transcanal approach, with myringoplasty. In our report, because the temporal bone CT showed no local invasion of the middle ear and mastoid region, the transcanal approach was used and the tumour successfully removed. Since only the outer epithelium of the tympanic membrane was partly removed, further myringoplasty was felt not to be indicated. The eardrum healed completely within two weeks. Despite not removing the whole eardrum, no local recurrence was found during one year of follow up. As the mass was only confined to the external ear canal, with no invasion of surrounding structures, excision via the transcanal approach was assumed sufficient. Myringoplasty was not performed as no perforation of the tympanic membrane was identified after the operation; because the schwannoma is a benign lesion arising from the subepithelial sensory nerve twigs, the remaining fibrous layer is sufficient to enable the tympanic membrane to heal.

- **An unusual case of schwannoma arising from the tympanic membrane is presented**
- **The extent and situation of the lesion was confirmed by high resolution computed tomography**
- **A transcanal approach without myringoplasty was used for excision. This was facilitated by obtaining a good plane of cleavage between the tumour and the fibrous layer of the tympanic membrane**

https://doi.org/10.1017/S0022215106004427 Published online by Cambridge University Press

References

1 Colreavy MP, Lacy PD, Hughes J, Bouchier-Hayes D, Brennan P, O'Dwyer AJ *et al*. Head and neck schwannomas – a 10 year review. *J Laryngol Otol* 2000;**114**:119–24
2 Supiyaphun P, Lekagul S, Shuangshoti S. Solitary schwannoma of the tympanic membrane: a case report. *Auris Nasus Larynx* 1999;**26**:191–4
3 Wu CM, Hwang CF, Lin CH, Su CY. External ear canal schwannoma: an unusual case report. *J Laryngol Otol* 1993;**107**:829–30
4 Lewis WB, Mattucci KF, Smilari T. Schwannoma of the external auditory canal: an unusual finding. *Int Surg* 1995; **80**:287–90
5 Harcourt JP, Tungekar MF. Schwannoma of the external auditory canal. *J Laryngol Otol* 1995;**109**:1016–18
6 Galli J, d'Ecclesia A, La Rocca LM, Almadori G. Giant schwannoma of external auditory canal: a case report. *Otolaryngol Head Neck Surg* 2001;**124**:473–4
7 Tran Ba Huy P, Hassan JM, Wassef M, Mikol J, Thurel C. Acoustic schwannoma presenting as a tumor of the external auditory canal. Case report. *Ann Otol Rhinol Laryngol* 1987;**96**:415–18
8 Woolford TJ, Birzgalis AR, Ramsden RT. An extensive vestibular schwannoma with both intracranial spread and lateral extension to the external auditory canal. *J Laryngol Otol* 1994;**108**:149–51
9 Albritton F, Lenis A. Cavernous hemangioma of the tympanic membrane. *Ear Nose Throat J* 1994;**73**:808
10 Magliulo G, Fusconi M. Capillary hemangioma of the tympanic membrane. *Otolaryngol Head Neck Surg* 1997; **116**:137
11 Somers T, Vercruysse JP, Goovaerts G, Govaerts P, Offeciers E. Isolated squamous cell carcinoma of the tympanic membrane. *Otol Neurol* 2002;**23**:808
12 Saunders RL, Weider D. Tympanic membrane sensation. *Brain* 1985;**108**:387–404

Address for correspondence:
Dr Chung-Feng Hwang,
123, Ta-Pei Road,
Niao-Sung Hsiang,
Kaohsiung Hsien, Taiwan, ROC.

Fax: 886 7 7313855
E-mail: chouwhay@gmail.com

Dr Chung-Feng Hwang takes responsibility for the integrity of the content of the paper.
Competing interests: None declared

https://doi.org/10.1017/S0022215106004427 Published online by Cambridge University Press