



CASE REPORT

One case, two lessons: an aberrant internal carotid artery causing acquired cholesteatoma[☆]



Um caso, duas lições: artéria carótida interna aberrante causando colesteatoma adquirido

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Introduction

The sequence of eustachian tube (ET) dysfunction leading to negative pressure and progressive tympanic membrane (TM) retraction has long been implicated as one of the most plausible hypotheses in the pathogenesis of acquired cholesteatoma.^{1,2} The objective of this case report is to notify on a patient with a *pars tensa* cholesteatoma, whose development was closely related to an aberrant course of the internal carotid artery.

Case report

The case of a 31-year-old woman with the chief complaint of long-standing, left-ear, purulent, foul-smelling otorrhea, ipsilateral pulsatile tinnitus, and hearing loss is described. She had no history of previous surgery.

Otomicroscopy revealed an extremely infected left ear, a posterior mesotympanic cholesteatoma, and erosion of the long process of the incus and the suprastructure of the stapes. The TM was intact anterior to manubrium, but a pulsatile brownish bulge was noticed filling the anterior mesotympanum. The appearance of this finding resembled a cholesterol granuloma or a superiorly displaced jugular bulb. The contralateral ear was completely normal. Audiogram confirmed a pure conductive hearing loss in the left ear and normality in the right side. High-resolution axial computed tomography scan showed an abnormal course of the petrous portion of the left internal carotid artery, protruding into the tympanic cavity through a complete dehiscence in the carotid plate (Fig. 1). The displaced artery completely filled the bony lumen of the eustachian tube, expanding and filling the protympanum. The mastoid was sclerotic, the TM severely retracted, and the mucosa markedly thickened in the posterior recesses (Fig. 1). The patient was submitted to inside-out wall-down mastoidectomy, without complications.

Discussion

The authors decided to present this case for two main reasons: to illustrate the development of a middle ear

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Figure 1 Left ear axial computed tomography scan – petrous internal carotid artery filling protympanum and veiled posterior recesses.

cholesteatoma through a retraction of the TM triggered by an unusual anatomical obstruction, an ectopic carotid artery and to emphasize the importance of obtaining a comprehensive pre-operative imaging workup in COM with cholesteatoma.

ET obstruction may be either anatomic or, more commonly, physiological. As indicated by Paparella et al.,³ obstructive sites (OS) can be caused by genetic anatomic variations or congenital malformations. In the present case, there was a clear relationship between the displacement of the carotid artery, the obstruction of the ET, middle ear gas deprivation, and the further retraction of the TM leading to cholesteatoma formation. It appears unequivocal that the sealing of the protympanum by the artery led to TM invagination, keratin accumulation, and infection.

The authors firmly believe that, at the present time, there is no reason to perform cholesteatoma surgery without ordering a CT scan. The morbidity and the cost of such an exam cannot be compared with the benefits that it provides for the surgical planning. Many structures are readily identifiable during the investigation.⁴ Moreover, it is mandatory to follow a protocol while analyzing temporal bone CT sections. It may vary according to the situation, but the minimal

routine adopted in this center in cases of COM is summarized by these points:⁵

1. Degree of pneumatization
2. Ossicular chain
3. Course of the facial nerve
4. Tegmen tympani and dural dehiscence
5. Integrity of labyrinth
6. Relation with the great vessels (carotid artery and jugular bulb)
7. Aeration of the protympanum
8. Position of the lateral sinus
9. Anatomical variations

In conclusion, through the analysis of one single case, two important concepts emerge: (1) ET dysfunction may play a decisive role in the pathogenesis of COM, at least in the earlier phases of the process; (2) temporal bone CT scan is affirmed as an extremely important step in surgical planning. It has the ability to show the extent of the disease, to influence the surgical technique employed, and it can help an informed surgeon anticipate intraoperative difficulties. As was seen here, one simple case demonstrated two good lessons!

Conflicts of interest

The authors declare no conflicts of interest.

References

1. Young N, Chole R. Etiopathogenesis of cholesteatoma. In: Souza C, Paparella MM, Sperling N, editors. *Atlas of otitis media: clinicopathologic correlations and operative techniques*. Mumbai: Bhalani Publishing House; 2005. p. 51–6.
2. Sadé J, Ar A. Middle ear and auditory tube: middle ear clearance, gas exchange and pressure regulation. *Otolaryngol Head Neck Surg.* 1997;116:499–524.
3. Junh SK, Paparella MM, Kim LS, Goycoolea MV. Pathogenesis of otitis media. *Ann Otol Rhinol Laryngol.* 1977;86:481–93.
4. Desai SB, Mehta PS. Imaging of the temporal bone. In: Souza SD, Claussen C, editors. *Modern concepts of neurotology*. Mumbai: Prajakta; 1997. p. 13–66.
5. Swartz JD, Hamsberger R, Mukherji SK. The temporal bone: contemporary diagnostic dilemmas. *Radiol Clin N Am.* 1998;36:819–53.