External Auditory Canal Cholesteatoma Causing Facial Paralysis

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Abstract

Objectives: To present a unique case report of external auditory canal (EAC) cholesteatoma resulting in facial paralysis.

Study design: Case report.

Methods: Radiographic imaging was obtained for diagnosis with a subsequent canal wall down tympanomastoidectomy, facial nerve decompression, and a cholesteatoma resection performed.

Results: Diagnosis of EAC cholesteatoma was made using CT and MRI modalities. Post operatively, patient improved from VI/VI facial paralysis, to grade I after six months.

Conclusions: EAC invasion can result in facial paralysis. In this case we showed surgical intervention can fully reverse facial paralysis.

Introduction

- External auditory canal (EAC) cholesteatoma is a rare inflammatory temporal bone lesion that is estimated to occur in 1.2 out of 1000 new patients presenting to otology practices. [1, 2]
- EAC cholesteatoma can develop spontaneously or following surgery, trauma, or infection, and is characterized histologically by keratinizing squamous epithelium.
- Patients with EAC cholesteatoma typically present with chronic otorrhea, otalgia, and obstruction due to bone erosion.[3]
- Clinically, EAC cholesteatoma shares many similarities with keratosis obturans, but these two entities differ in that cholesteatoma features osteonecrosis and sequestrum of the underlying bone, while keratosis obturans will present within a normal and fully skin-lined EAC without epithelial loss.[4]
- EAC cholesteatoma oftentimes requires surgical intervention, while keratosis obturans can be treated less invasively.[3]
- We present a unique canal cholesteatoma case presenting as facial paralysis.

Methods and Materials

- Retrospective review of one patient with EAC cholesteatoma patients presenting to our otology/neurotology clinic in a tertiary care academic center.

Results

- A 38-year-old male with no prior medical history presented to the emergency department with a 5-week history of right-sided otalgia, bloody otorrhea, and a 10-day history of right-sided grade VI/VI facial paralysis that reportedly started after cleaning his ear with a cotton-swab.
- In-office binocular microscopic examination revealed extensive keratin debris within the right EAC with granulation tissue and a normal left side
- Frozen section biopsy of granulation tissue sent from the clinic demonstrated irritated squamous epithelium and granulation tissue.
- CT demonstrated destruction of the EAC originating in the medial canal with erosion of the anterior and posterior canal walls and extending to the vertical facial nerve segment [**Figure 1**].
- The patient was subsequently taken to the operating room, and a canal wall down tympanomastoidectomy, facial nerve decompression, and cholesteatoma resection was performed with obliteration of the mastoid using bone pate and cartilage.
- Approximately 1.5 cm of the vertical segment of the facial nerve was decompressed and was noted to be inflamed and edematous intraoperatively. Histopathology confirmed presence of granulation and cholesteatoma tissue.
- At one-week post-operatively, the facial paralysis improved from grade VI/VI to grade III/VI. At six months post-operatively, facial nerve function was grade I, and hearing had returned to normal.

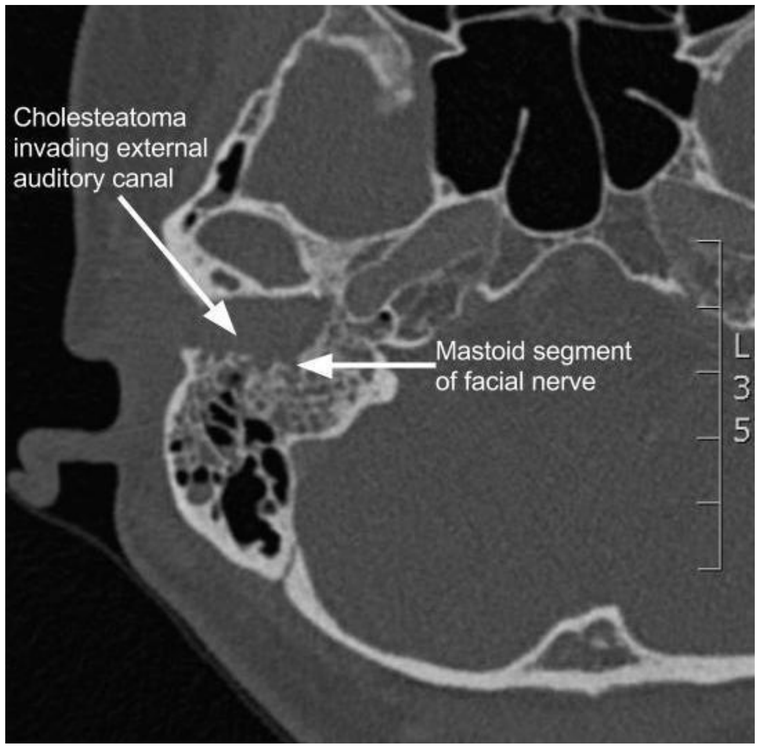

Figure 1a: Axial CT scan illustrating the cholesteatoma in the external auditory canal.

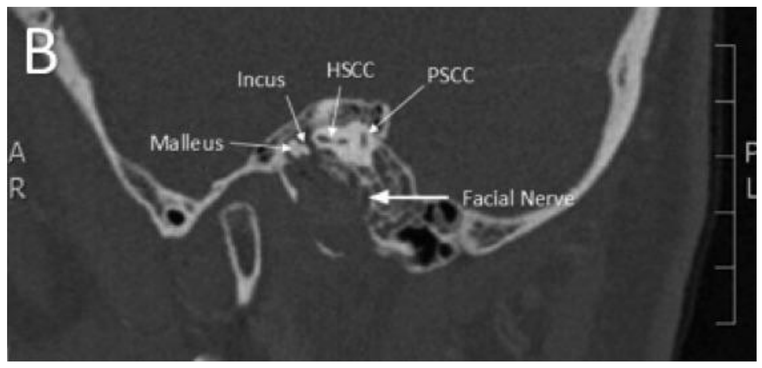

Figure 1b: Sagittal CT scan showing cholesteatoma invasion into the facial nerve.

Discussion

- EAC cholesteatoma is a rare condition that presents with otorrhea, otalgia, obstruction, hearing loss, aural fullness, itching, or can even be asymptomatic.
- This is the first report of EAC cholesteatoma causing facial paralysis in an otherwise healthy male who presented with otalgia and hearing loss.
- This presentation is rare and raises the possibility of EAC cholesteatoma in patients with facial weakness and impacted debris or bony destruction within the EAC.
- Treatment options for canal cholesteatoma typically consist of tympanomastoidectomy or canalplasty, which are highly curative, but less invasive options such as local debridement and topical antibiotics have also been used with varying degrees of effectiveness.[4] While local debridement may be effective in a highly compliant selected patient,[3] this case highlights the danger of potential complication if a patient is unable to follow up regularly.
- The incidence of facial paralysis in middle ear/mastoid cholesteatoma has been reported to be approximately 1.2% of cases, with sudden onset being more common then gradual onset with petrous bone cholesteatoma being more likely to cause facial paralysis.[5] The severity of facial paralysis ranges in severity from 31-66% and 34-69% for complete and incomplete paralysis reported in the literature.[5] Recovery of facial nerve paralysis following resection of a middle ear cholesteatoma depends on the extent of invasion and time from paralysis onset to surgery.[5] Reported rates of complete facial paralysis recovery range from 42-81%, stable or partial function in 24-50%, and failure in 1-19% of patients.[5]

Conclusions

- This is the first report of facial paralysis from EAC cholesteatoma.
- Urgent decompression in this case led to normalization of facial function from a grade VI baseline.

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References

1. Naim R, Linthicum F, Shen T, Bran G, Hormann K. Classification of the external auditory canal cholesteatoma. Laryngoscope. 2005;115(3):455-60. Levenson MJ, Michaels L, Parisier SC. Congenital cholesteatomas of the middle ear in children: origin and management. Otolaryngologic clinics of North America. 1989 Oct;22(5):941-54.
2. Anthony PF, Anthony WP: Surgical treatment of external auditory canal cholesteatoma. Laryngoscope. 1982;92: 70-75.
3. Dubach P, Mantokoudis G, Caversaccio M. Ear canal cholesteatoma: meta-analysis of clinical characteristics with update on classification, staging and treatment. Curr Opin Otolaryngol Head Neck Surg. 2010;18(5):369-76.
4. Persaud RA, Hajioff D, Thevasagayam MS, Wareing MJ, Wright A. Keratosis obturans and external ear canal cholesteatoma: how and why we should distinguish between these conditions. Clin Otolaryngol Allied Sci. 2004;29(6):577-81.
5. Ikeda M, Nakazato H, Onoda K, Hirai R, Kida A. Facial nerve paralysis caused by middle ear cholesteatoma and effects of surgical intervention. Acta Otolaryngol. 2006;126(1):95-100.