



Two Cases of Unusual Cholesteatomas Involving the Facial Nerve

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Abstract

Objectives: To understand the diagnostic challenge of recurring middle ear cholesteatoma (MEC) causing facial paralysis.

Study design: Retrospective case series.

Methods: Chart review of two patients presenting with longstanding facial paralysis who were found to have missed MECs involving the facial nerve was performed.

Results: Patients A and B presented with facial paralysis (grade VI and V, respectively) for facial reanimation. Both patients had a history of cholesteatoma resection 20 and 15 years prior and reported facial paralysis for 7 and 1 years respectively. In addition, temporal bone imaging was initially reported negative by both patients and the radiologists. On MRI imaging, Patient A showed infiltration of the geniculate ganglion. On MRI, Patient B showed cholesteatoma expansion around the superior semicircular canal involving the geniculate ganglion. Both had resection via a middle cranial fossa approach. Patient A experienced no improvement in facial function postoperatively while patient B improved from grade V to III.

Conclusions: Cholesteatomas located on the floor of the middle fossa can be missed by traditional imaging techniques and require a high index of suspicion to be detected. The reading radiologists overlooked both lesions in these two cases. To confirm a diagnosis, a non-echoplanar diffusion weighted image (DWI) is beneficial for assessing the possible presence of cholesteatoma on the floor of the middle fossa. In addition, these cases show that patients with a history of cholesteatoma resection must obtain radiological non-echoplaner DWI surveillance if no second look surgery is performed.

Introduction

- MEC has a prevalence of 9.2 per 100,000.¹
- The invasion of these growths are unpredictable, and can have devastating neurological consequences.
- In rare cases, a cholesteatoma can invade medially to the middle fossa and alter facial nerve function.
- Due to the radiological difficulty in diagnosing these lesions, and the need for multispecialty interventions, these patients can prove to be challenging.
- Due to its uncommon occurrence, only a few cases of middle fossa invasion have been described in the literature.
- In this case series we describe two patients that present with facial nerve deficits as a result of cholesteatoma invasion and describe its radiographic challenges.

Methods and Materials

- Retrospective review of two CC patients presenting to our neurotology clinic at a tertiary care academic center.

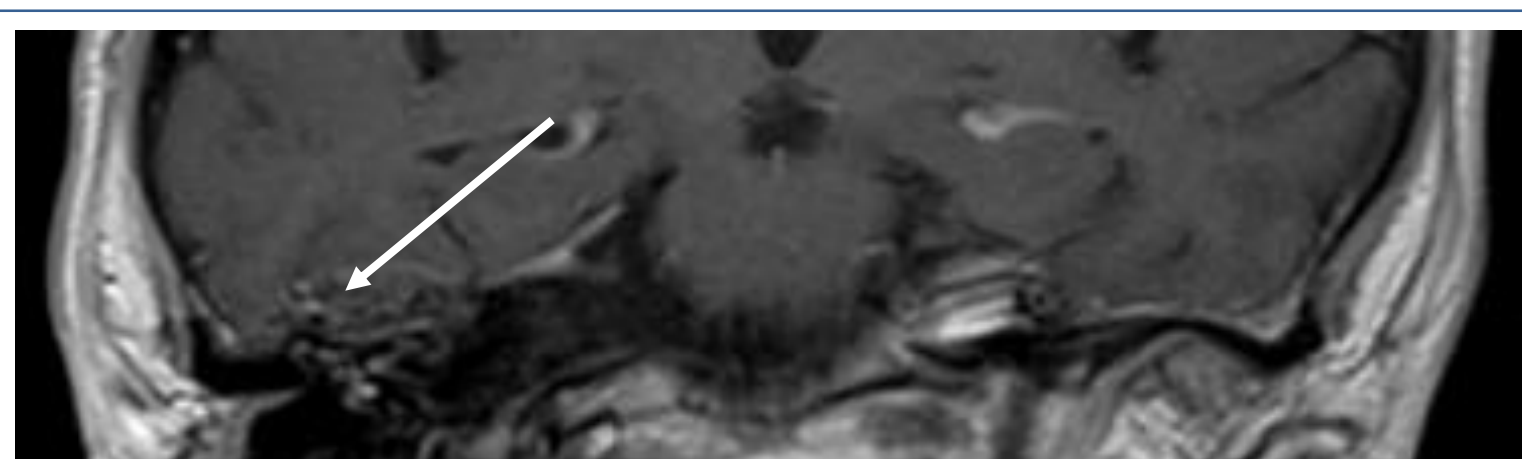


Figure 1. T1 post-gadolinium coronal sequence of patient 1, initially missed by radiologist. Arrow pointing to cholesteatoma area.

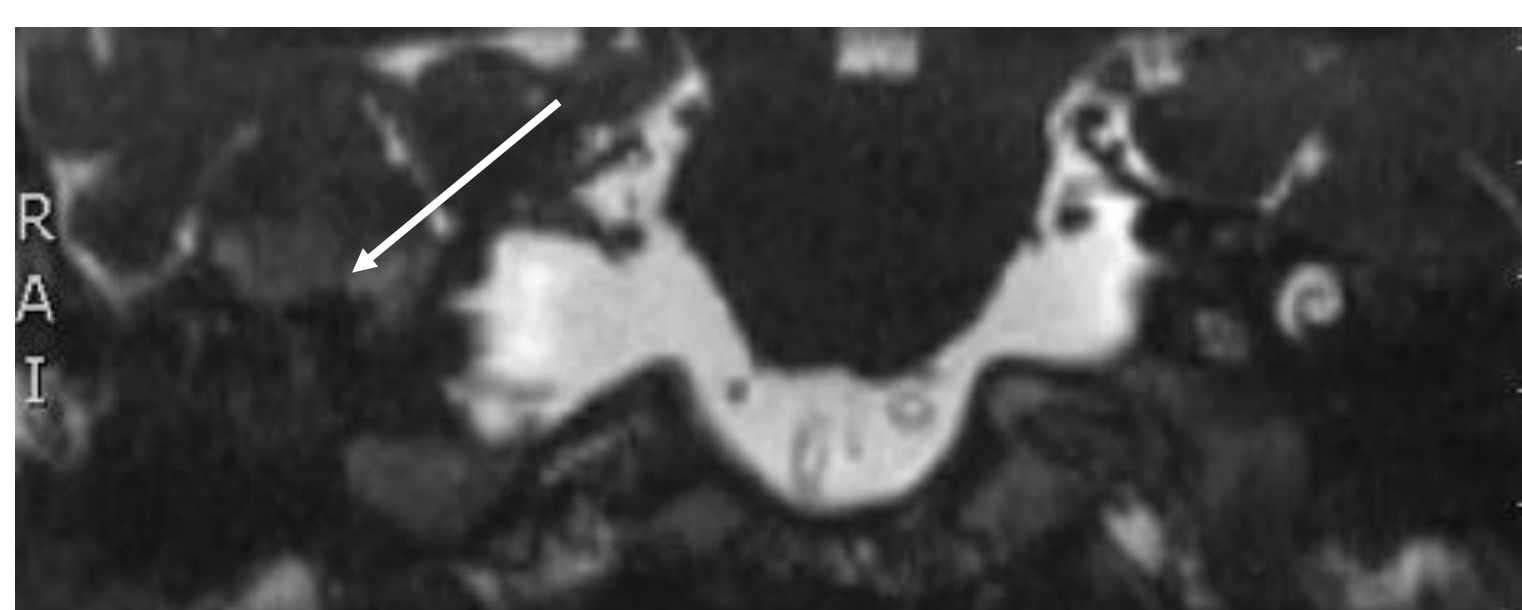


Figure 2. Coronal CISS sequence of patient 1. Arrow pointing to area of cholesteatoma.

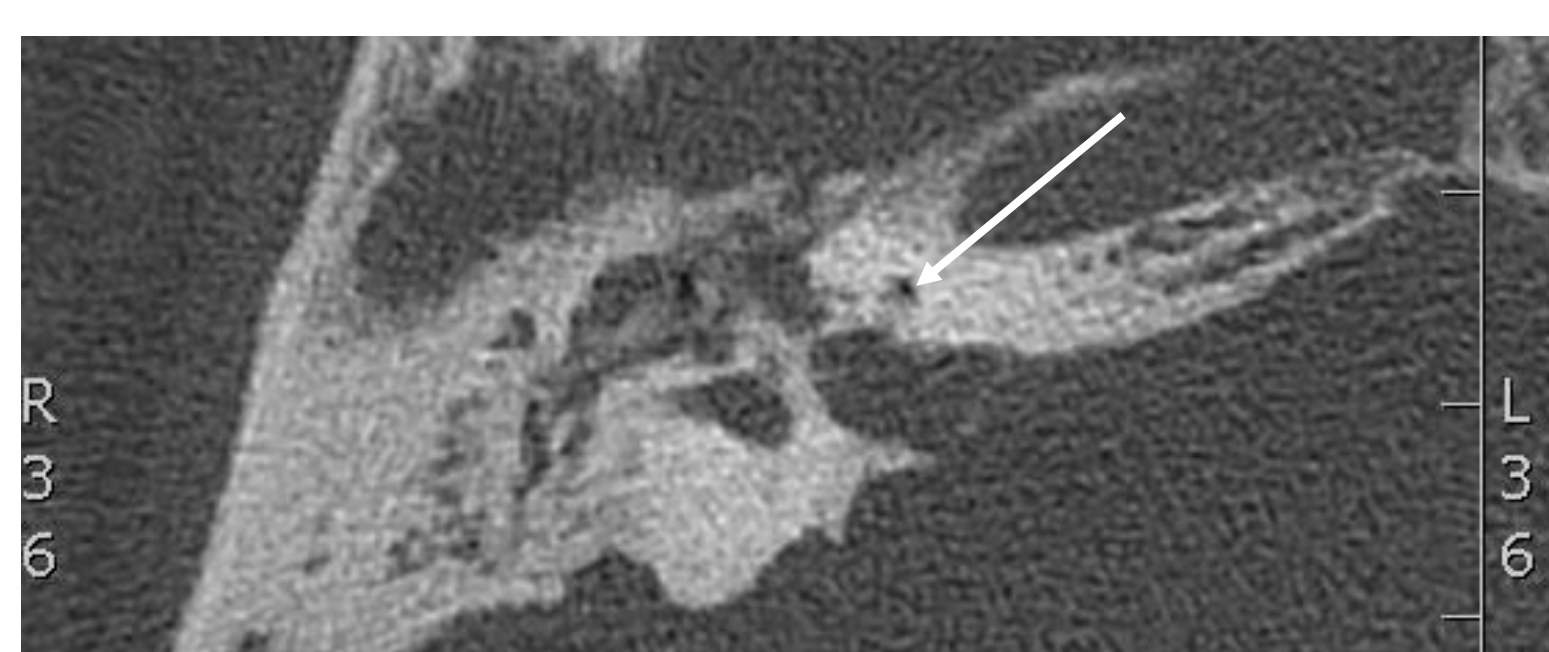


Figure 3. Axial CT of patient 1. Neo-ossification around geniculate, and cochlear ossification (arrow) is seen.

Table 1. Tabulation of lesion characteristics.

	Patient A	Patient B
Age (years)	61	74
Sex	M	F
Facial grade on presentation	VI	V
Facial paralysis grade post-op	VI	III
Years of facial paralysis	7 years	1 years
History of cholesteatoma resection	20 years prior	15 years prior
Imaging that missed the cholesteatoma	Brain MRI and CT temporal bones	Brain MRIx3 and CT temporal bones
Lesion location	Geniculate ganglion	Geniculate ganglion

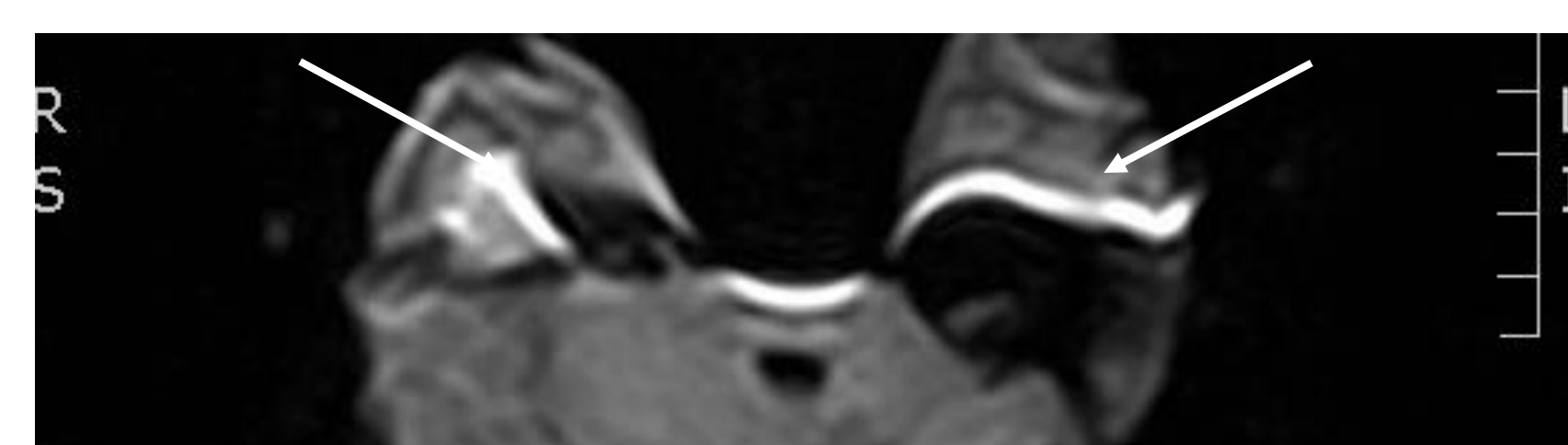


Figure 4. Axial DWI MRI of patient 1, initially missed by radiologist. Cholesteatomas on the floor of the MCF can be missed due to the brain/bone junction artifact (arrows)

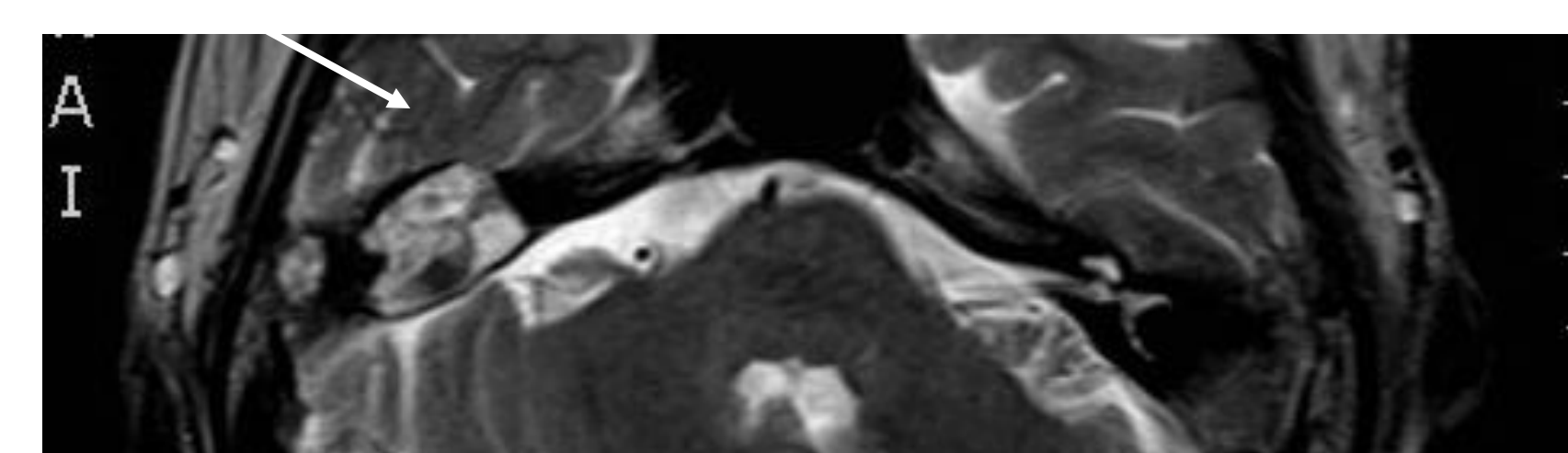


Figure 5. Axial T2 MRI of patient 1, had the only suspicious area (arrow) that the radiologist ignored likely due to previous surgery considering it fluid in the mastoid.

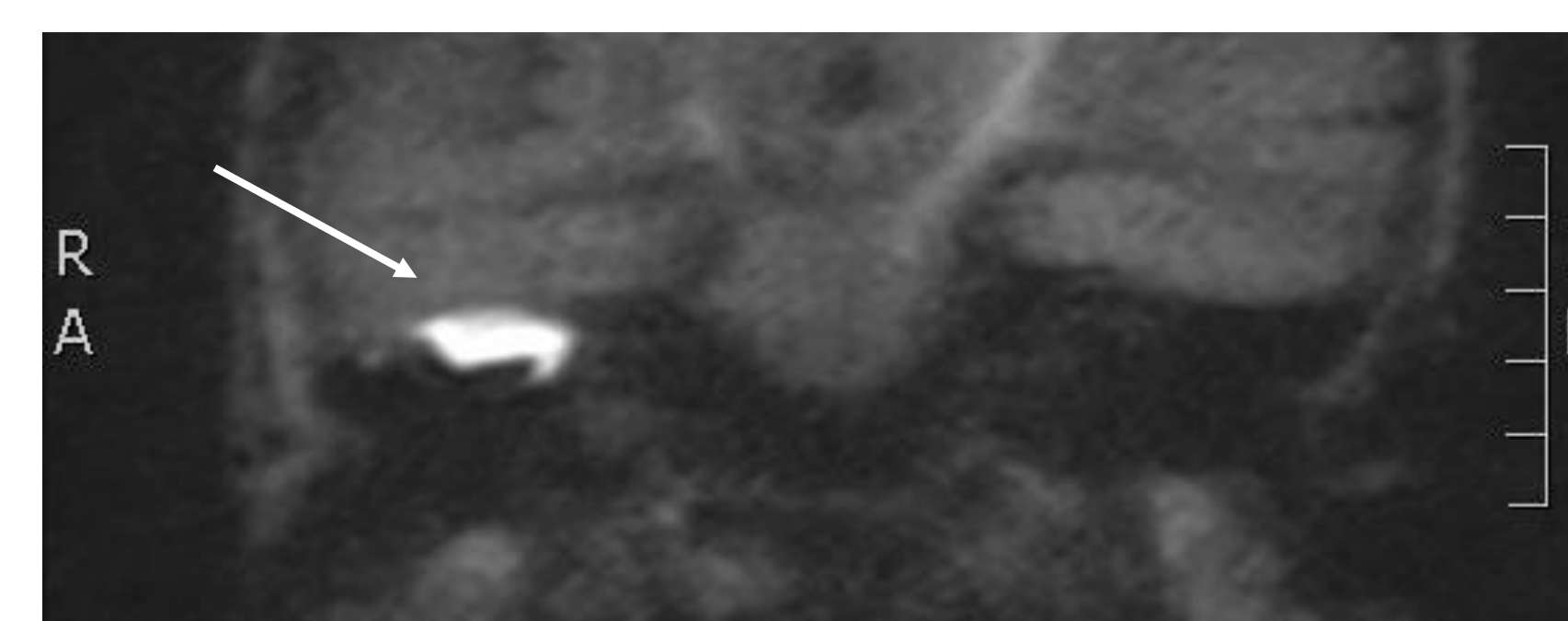


Figure 6. Coronal HASTE sequence of patient 1, showing the cholesteatoma between the brain and the temporal bone (arrow).

Discussion

- In both cases presented here, cholesteatoma recurrence and history of distant tympanomastoidectomy may complicate radiologic findings.
- Since multiple radiologists initially missed the lesion using conventional methods- more sensitive modalities should be used for patients with a high index of suspicion.
- Non-echoplanar (Coronal HASTE) DWI served as the optimal diagnostic modality in these patients
- A non-echoplaner DWI sequence has been recognized as a more specific diagnostic test for detecting cholesteatoma.²
- Conventional axial diffusion weighted MRI has been shown to have poor sensitivity.³
- Therefore, we suggest consistent radiologic surveillance using non-echoplaner DWI for patients with a history of MEC for 3 years post-op if a second look is not performed.
- In both cases, surgical resection did not completely restore facial movement due to the significant nerve damage.

Conclusions

- Patients with a history of MEC should be closely monitored due to the significant likelihood of recurrence.
- An axial DWI will likely miss a cholesteatoma at the brain/temporal bone junction due to the artifact created at this junction.
- A non-echoplaner DWI (coronal HASTE) sequence is necessary to evaluate cholesteatoma when using radiologic studies to monitor recurrence.
- These consequences can be mitigated with routine radiologic surveillance using non-echoplaner DWI.

References

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