

Complete Hearing Recovery after Retrosigmoid Resection of Jugular Foramen

Schwannoma with Concurrent Ipsilateral Vestibular Schwannoma

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Introduction

- Cerebellopontine angle (CPA) tumors frequently present with hearing loss, which influences whether a hearing preservation vs hearing ablative surgical approach is chosen.
- Unilateral sensorineural hearing loss is the most common presenting symptom of both vestibular schwannoma (VS) as well as jugular foramen schwannoma (JFS).¹
- Outside of Neurofibromatosis Type 2 (NF2), multiple intracranial tumors are rare – even more so when isolated to within the CPA.²
- We discuss a unique case of **complete hearing recovery** after **resection of a JFS via the retrosigmoid approach**, in a patient who also had a small intracanalicular vestibular schwannoma (VS).

Case

Background:

- 46-year-old woman presented with left ear fullness, tinnitus, and imbalance for nine months. She had no lower cranial nerve dysfunction.

Findings:

- Audiometry demonstrated Class D hearing with 4% word-recognition on the left (Figure 1).
- Vestibular testing showed absent caloric response on the left and subtle central findings
- MRI demonstrated a left 3.3 cm JFS and separate left 1 cm intracanalicular VS (Figure 2a and 2b).

Treatment:

- A retrosigmoid approach was performed for a radical subtotal resection of the JFS, relieving the mass effect on the vestibulocochlear nerve. The small intracanalicular VS was not manipulated (Figure 2c and 2d).
- Pathology confirmed schwannoma with NF2 mutation in the tumor, but normal NF2 germline.

Follow-up:

- Post-op audiometry at 6 weeks showed normal audiometric thresholds with 100% discrimination (Figure 3).
- Subtle left caloric response was noted on post-op vestibular testing and central oculomotor findings improved.
- MRI at 6-month follow-up demonstrated no growth of either tumor. No balance deficits were observed.
- The patient will be followed with serial imaging, with consideration of radiosurgery to the small IAC tumor and residual jugular foramen tumor in the future.

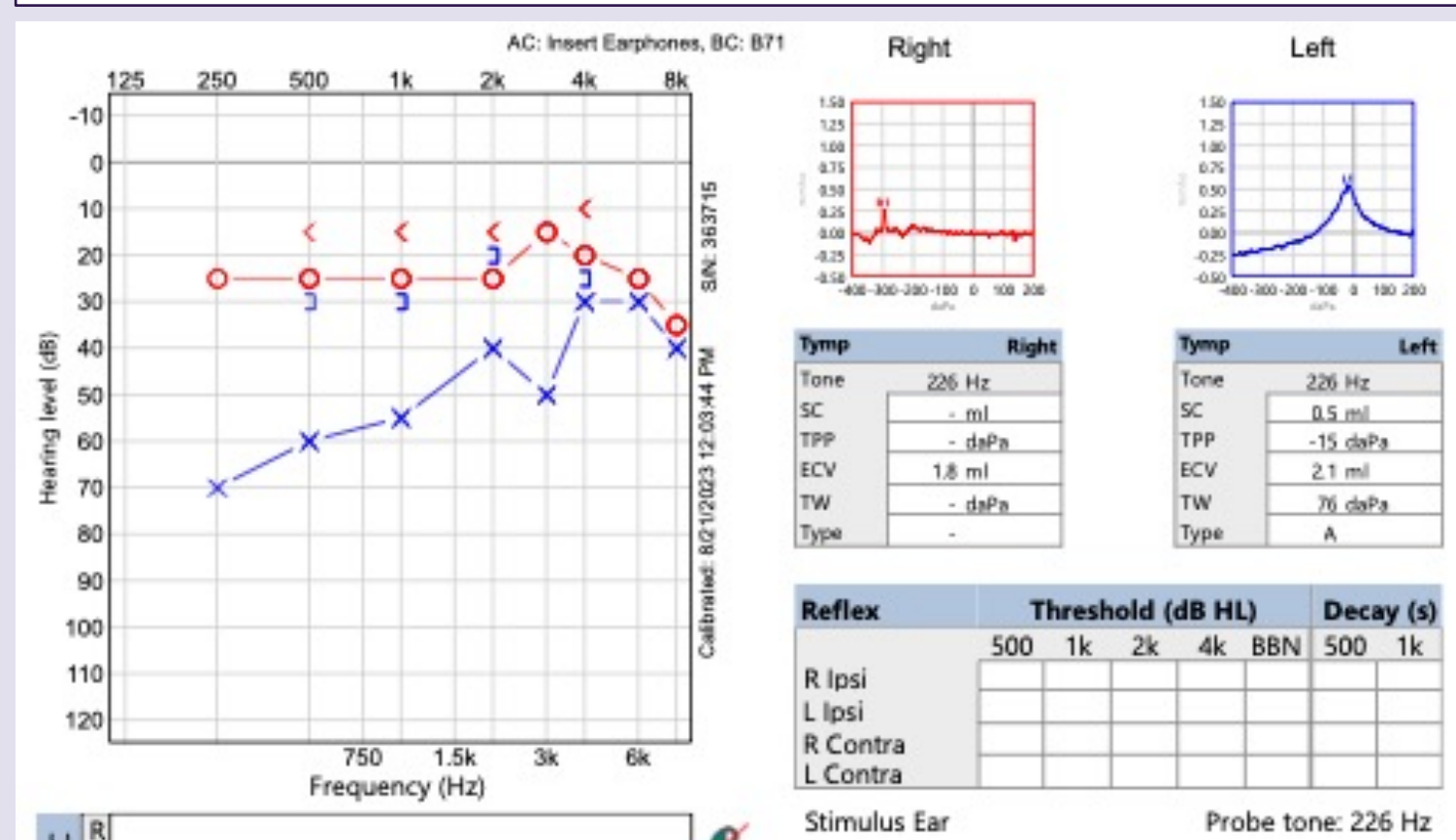


Figure 1. Pre-operative audiometric testing showing significantly reduced pure tone thresholds and 4% word recognition in the affected ear, consistent with AAO-HNS class D hearing.

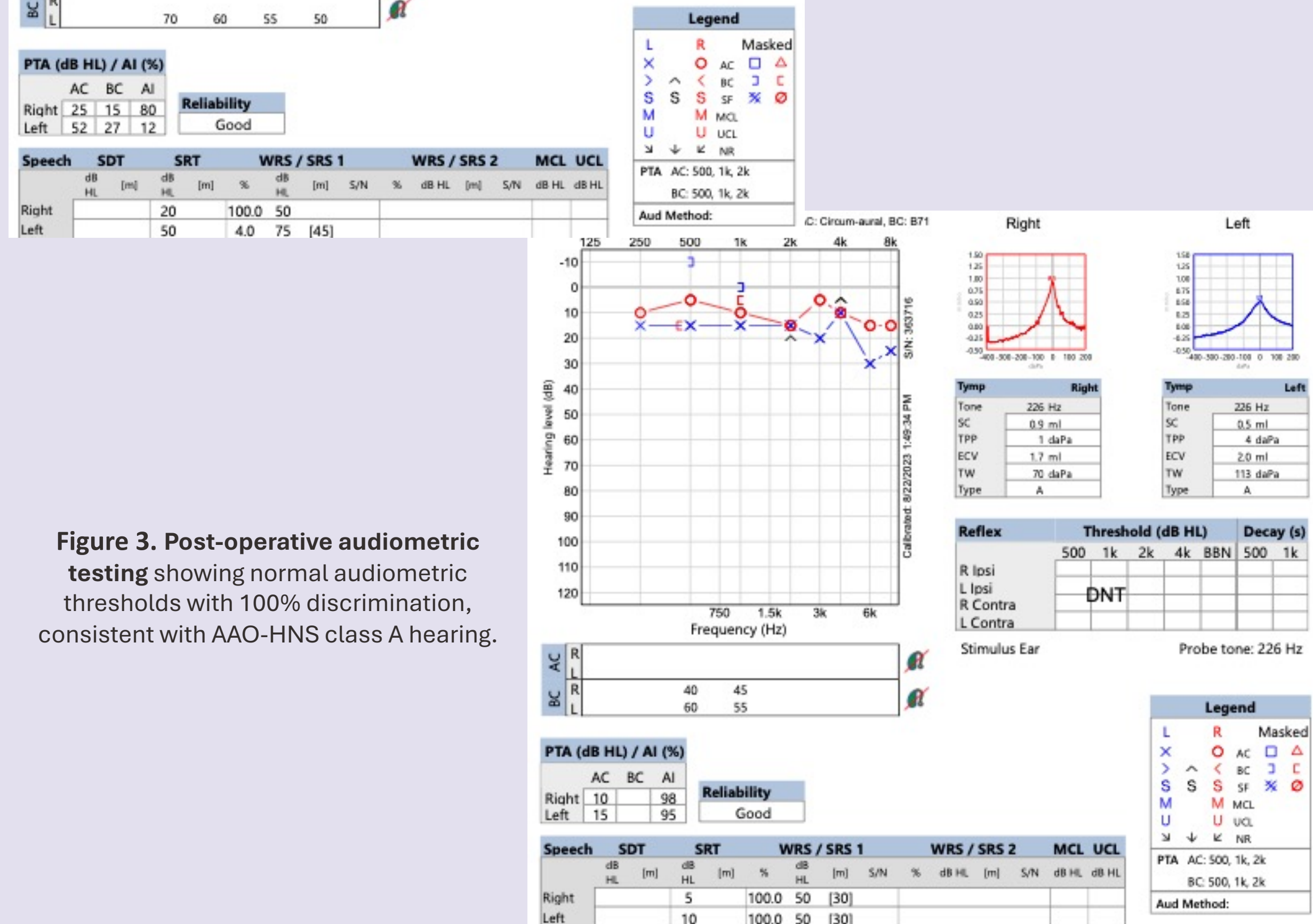


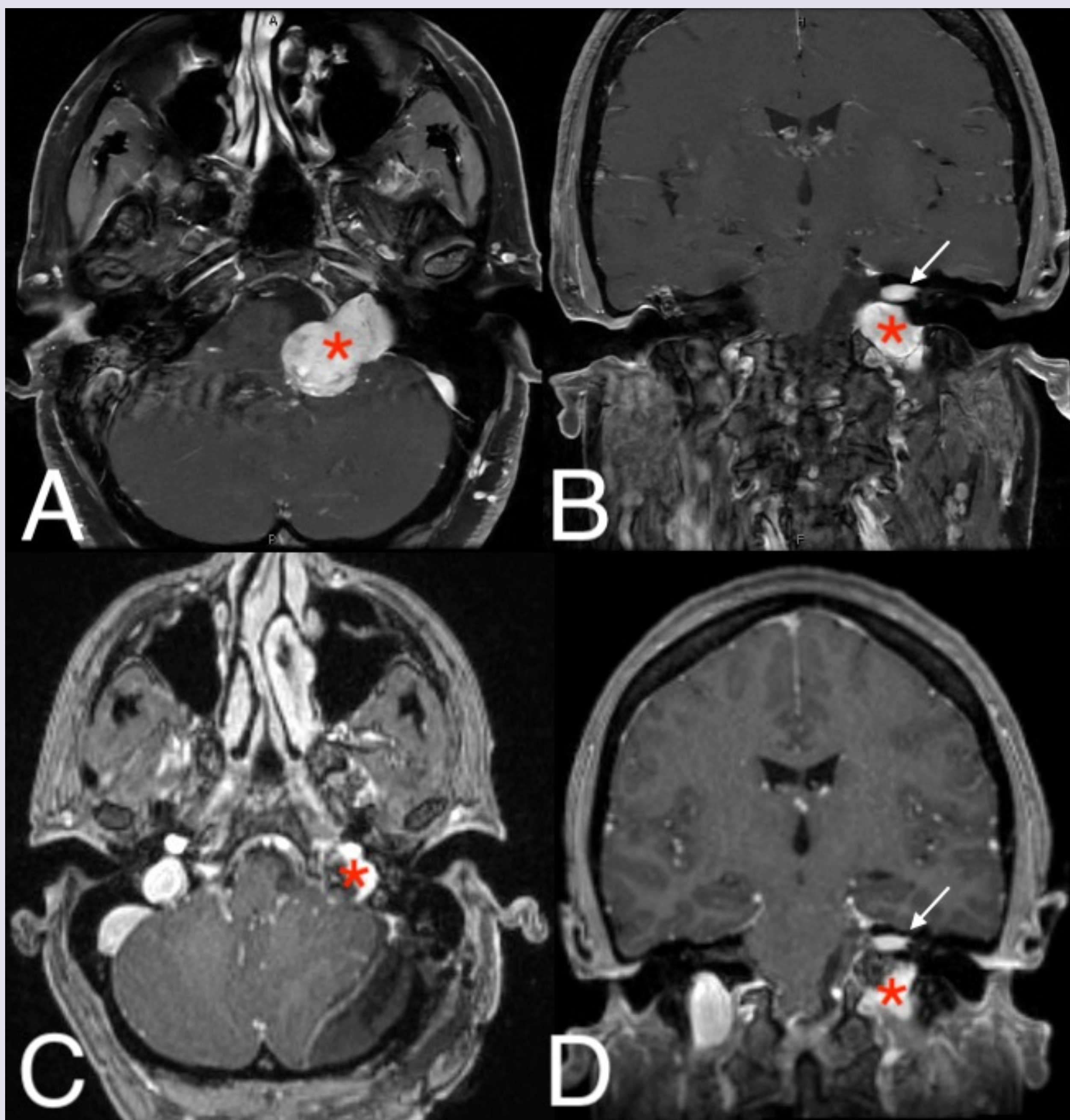
Figure 3. Post-operative audiometric testing showing normal audiometric thresholds with 100% discrimination, consistent with AAO-HNS class A hearing.

Discussion

- The **novelty of this case lies in the complete recovery of hearing after resection of JFS only**, without manipulation of the concurrent ipsilateral VS.
- There have been other cases of reversible hearing loss following resection of non-VS CPA tumors reported in the literature, from epidermoid tumors to meningioma and JFS.^{3,4}
 - Improvements may occur over the course of a few days or weeks after the operation, potentially even in the first few postoperative days as with our patient.
 - Thus, non-VS CPA tumors may have different etiologies and prognoses as compared to VS with regard to hearing, with complete and even rapid recovery of hearing possible post-operatively.**
- There is **no current consensus for optimal surgical management of JFSs**.
 - For JFS, several authors have advocated for the avoidance of hearing ablative approaches, citing the possibility of hearing improvement following JFS resection.^{5,6}
 - The **presented case supports the use of a hearing-preservation approach in similar cases, regardless of pre-operative hearing status.**

Figure 2a and b. Pre-operative MRI with JF tumor (*) and separate JF (*) and IAC tumors (arrow).

Figure 2c and d. Post-operative MRI with residual JF tumor (*) and residual JF tumor (*) with non-manipulated IAC tumors (arrow).



Conclusion

- Hearing preservation surgical approaches should be considered in the treatment of JFS, even in cases of non-serviceable pre-operative hearing, as hearing recovery is possible.

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