

MANAGEMENT OF A LARGE JUGULAR FORAMEN SCHWANNOMA IN AN ELDERLY PATIENT: A FUNCTION-SPARING HYBRID APPROACH

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Background & Objective

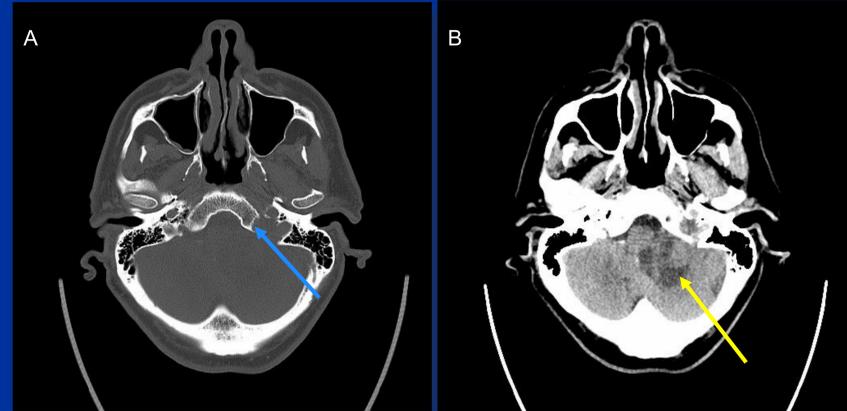
CLINICAL CHALLENGE Jugular Foramen Schwannomas (JFS) are rare, benign tumors (WHO Grade 1) that present with lower cranial neuropathies (CN IX–XI). In patients with a history of systemic malignancy, distinguishing JFS from skull base metastasis is a critical diagnostic dilemma that alters surgical strategy.

OBJECTIVE To demonstrate the "Hybrid Management" paradigm (Planned Subtotal Resection + Radiosurgery) for preserving lower cranial nerve function in complex skull base tumors.

Case Presentation

HISTORY A 70-year-old male with a history of Gastrointestinal Stromal Tumor (GIST) in remission presented with 10 days of intractable vertigo, orthostatic hypotension, and falls.

IMAGING FINDINGS (Fig 1 A, B, C, D & E)



CT Bone Window: Smooth, corticated expansion of the jugular foramen

CT Soft tissue Window: Heterogenous mass infiltrating the cerebellum

Teaching Point: This "pressure erosion" pattern favors a slow-growing benign lesion over the permeative/destructive changes typical of metastasis.

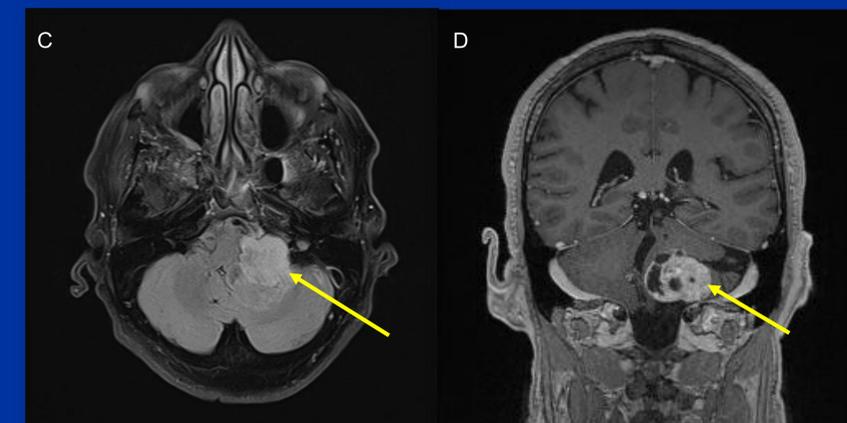


Fig. 1 (C, D, E): Pre-operative MRI assessment of tumor extent. (C) Axial FLAIR and (D) Coronal T1 post-contrast imaging demonstrate a large mass (yellow arrow) arising from the left jugular foramen. Note the heterogeneous enhancement (D) and trans-spatial extension superiorly into the cerebellopontine angle (CPA) and inferiorly to the infratemporal fossa (E).

Differential: Absence of "salt-and-pepper" flow voids makes Paraganglioma unlikely.

The Diagnostic Dilemma

METASTASIS VS. BENIGN TUMOR?

Despite imaging features suggesting a benign schwannoma, the patient's history of GIST necessitated a definitive diagnosis.

- **Metastasis:** Rare in the skull base but possible; would require systemic therapy.
- **Schwannoma:** Requires local control but carries high risk of CN IX/X injury during resection.
- **Decision:** Microsurgical resection for **brainstem decompression** and **tissue diagnosis**, rather than radical gross total resection.

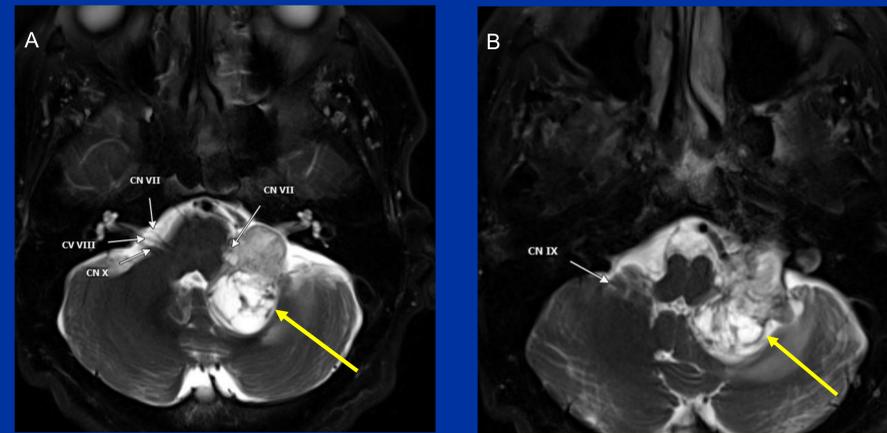
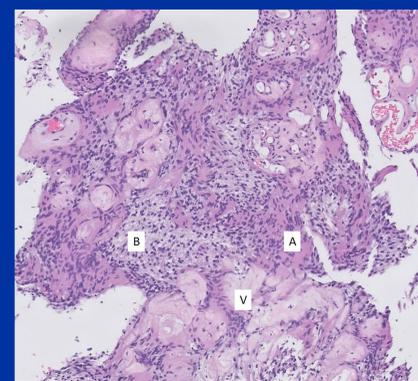


Fig. 2: Axial T2-weighted imaging (T2WI) assessment of cranial nerve involvement. (A) Normal contralateral anatomy (white arrows) is preserved, contrasting with the posterior displacement and distortion of the ipsilateral left CN VII/VIII complex. (B) The left CN IX/X complex is indistinguishable from the tumor mass, consistent with the lesion's origin within the jugular foramen.

Management & Pathology

SURGICAL STRATEGY: PLANNED SUBTOTAL RESECTION (STR)

- **Approach:** Suboccipital craniotomy.
- **Intra-operative Findings:** Cystic, edematous tumor adherent to the lower cranial nerves.
- **Outcome:** Brainstem successfully decompressed. Tumor capsule left along the pars nervosa to preserve neural integrity.



PATHOLOGY (Fig 3)

- **Diagnosis:** CNS WHO Grade 1 Schwannoma.
- **Immunohistochemistry:** Confirmed benign neural origin; ruled out metastatic GIST.
- **Microscopy:** Classic Antoni A (hypercellular) and Antoni B (hypocellular/myxoid) areas with hyalinized vessels (V).

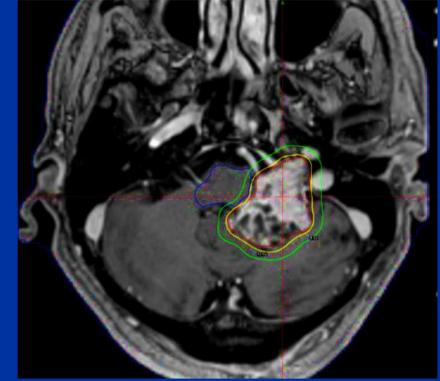


Fig. 4: Adjuvant Gamma Knife Radiosurgery Planning. High-resolution MRI target definition for the residual tumor (15.7 cc) following subtotal resection. A marginal dose of 12 Gy was prescribed to the 50% isodose line (yellow contour) to achieve tumor control. Note the steep dose fall-off (green line), which was critical for sparing the adjacent brainstem and lower cranial nerves.

Post-Op & Adjuvant Therapy

Surgery -> Residual Tumor -> Gamma Knife

COMPLICATION MANAGEMENT Post-operatively, the patient developed dysphagia—a known risk of jugular foramen manipulation.

- **Intervention:** Early ENT referral for suspension microlaryngoscopy and balloon dilation.
- **Outcome:** Dysphagia improved, validating the decision to avoid radical resection.

ADJUVANT RADIOSURGERY (Fig 4) Residual tumor volume (15.7 cc) was treated with **Gamma Knife Radiosurgery**.

- **Dose:** 12 Gy to the 50% isodose line.

• **Neuroradiology Role:** High-resolution MRI planning allowed for conformal dosing that spared the adjacent brainstem and cochlea.

Conclusion (The "Take-Home" Message)

TEACHING POINTS

This case highlights a successful multidisciplinary management strategy for a large jugular foramen schwannoma.

1. **The "Hybrid" Paradigm (STR + SRS):** Gross total resection of large Jugular Foramen Schwannomas often results in permanent CN IX–XI deficits (dysphagia/hoarseness). This case demonstrates that **Planned Subtotal Resection** for decompression, followed by **Gamma Knife Radiosurgery** for the residual, offers excellent tumor control while maximizing quality of life.
2. **The Radiologic Pivot:** Even in patients with malignancy (GIST), smooth bony remodeling is a strong predictor of benign pathology. This distinction guides the surgeon to prioritize nerve preservation over "oncologic" resection.
3. **Multidisciplinary Execution:** Success required a coordinated workflow: **Neuroradiology** defined the tumor limits; **Neurosurgery** decompressed the brainstem; **ENT** managed the airway; and **Rad Onc** sterilized the remnant.

References

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