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Imaging Characteristics of Jugular Foramen Paragangliomas: A Case Series

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Abstract: ***Paragangliomas are rare neuroendocrine tumors arising from paraganglion cells, commonly occurring in the head and neck region. Among these, jugular foramen paragangliomas are a rare subset that requires precise imaging for diagnosis and management. We present a case series of 4 histopathological confirmed cases of jugular foramen paragangliomas evaluated with cross - sectional imaging including CT and MRI. The study highlights characteristic imaging features, differential diagnosis, and the importance of radiological evaluation in pre - operative planning.***

Keywords: Paraganglioma, Jugular Foramen, Glomus Jugulare, CT, MRI, Hypervascular Tumor, Neuroimaging

1. Introduction

Paragangliomas of the head and neck originate from neural crest derivatives known as paraganglia. Jugular foramen paragangliomas (glomus jugulare tumors) are rare, slow - growing, hypervascular tumors arising from the pars vascularis in the jugular foramen. Though benign, their location near vital neurovascular structures presents diagnostic and therapeutic challenges. This case series aims to illustrate the typical imaging characteristics of jugular foramen paragangliomas and their differential diagnosis.

2. Materials and Methods

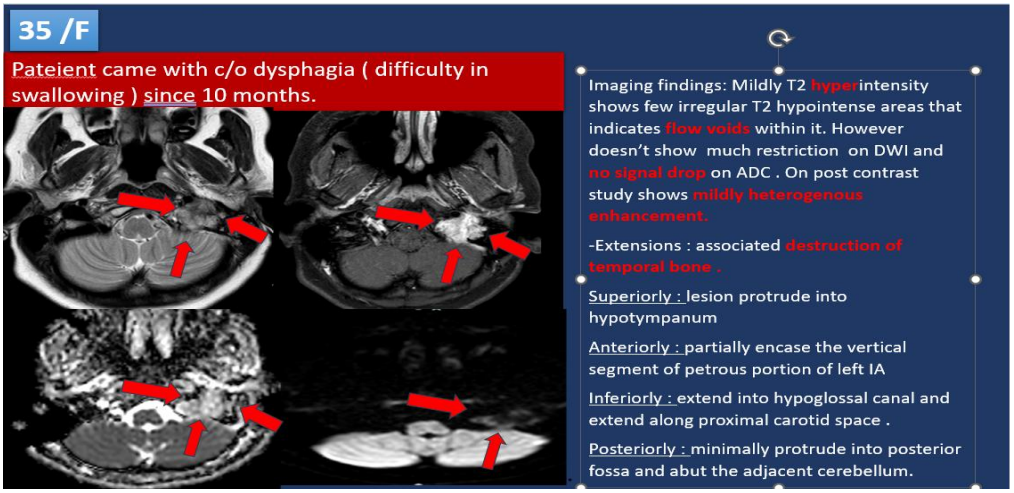
We retrospectively reviewed imaging findings of 4 patients diagnosed with jugular foramen paraganglioma in the Department of Radiodiagnosis, Sri Siddhartha Medical Hospital. All patients underwent both CT and MRI using a 16 - slice CT scanner and 1.5T MRI. Imaging features such as tumor size, location, vascular involvement, and enhancement patterns were analyzed.

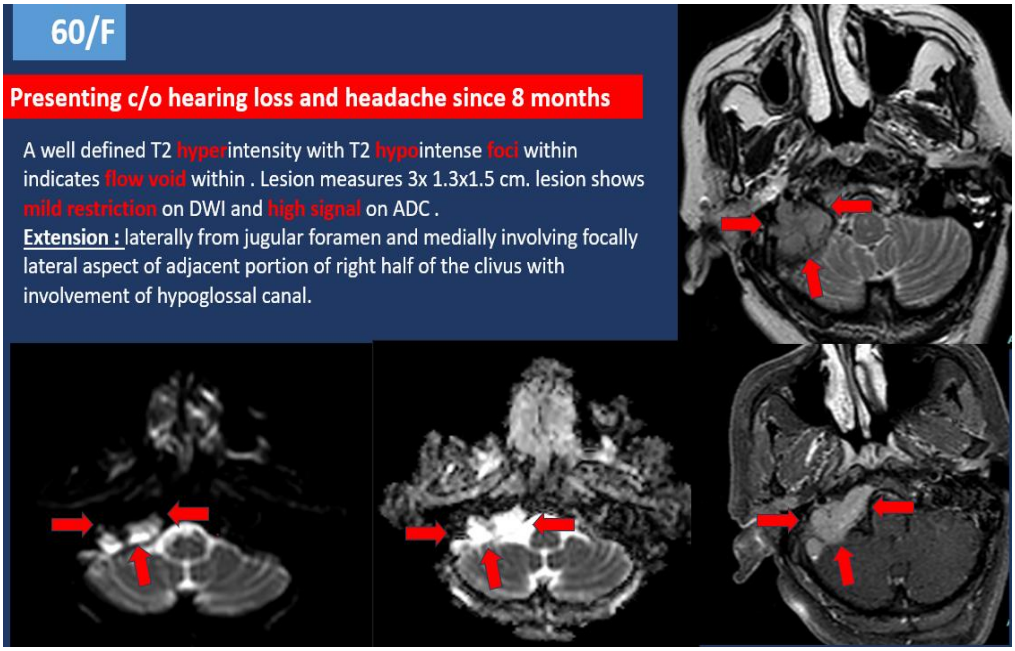
3. Results

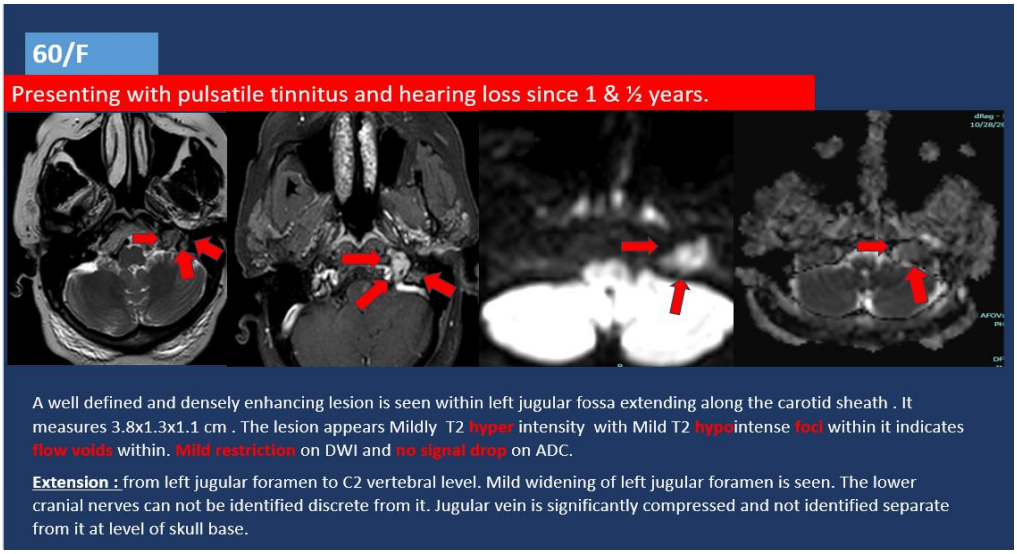
Patient Demographics: 4 patients (3 females, 1 male); mean age 48.3 years (range 25–60 years).
Clinical Presentation: Tinnitus, hearing loss, ringing sensation, and cranial nerve deficits.

Cases Summary:

Case 1: 25yrs Female, 2.2x2.2x2.4 cm, hypervascular mass encasing IJV and ICA.
Case 2: 30yrs Male, small lesion, salt - and - pepper appearance on MRI.
Case 3: 60yrs Female, large lesion encasing multiple cranial nerves.
Case 4: 40yrs Male, 4.5 cm lesion encasing IJV and ICA.







Common Imaging Features:

- Hypervascular tumors with intense contrast enhancement (100%)
- Tumor size range: 1.5–4.5 cm (mean 2.8 cm)
- Salt - and - pepper appearance on MRI (73%)
- Internal jugular vein encasement (80%), ICA encasement (47%)
- Bony erosion with moth - eaten appearance
- No adjacent soft tissue invasion in most cases

4. Discussion

Jugular foramen paragangliomas present distinctive radiological features. CT imaging reveals bony erosion in a moth - eaten pattern while MRI demonstrates hypervascularity with salt - and - pepper appearance due to flow voids. Key differential diagnoses include carotid body paraganglioma and vagal schwannoma. Accurate imaging not only aids diagnosis but also informs surgical and endovascular treatment planning. Early detection of vascular encasement and cranial nerve involvement can prevent complications.

5. Conclusion

Our case series emphasizes the role of high - quality cross - sectional imaging in diagnosing jugular foramen paragangliomas. Radiologists should recognize the classic imaging features to facilitate timely diagnosis, optimize surgical planning, and improve patient outcomes.

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