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Abstract

Objectives: Our goal is to present a very rare patient with a carotid canal sympathetic plexus schwannoma and oropharyngeal involvement.

Methods: Case report.

Results: Our patient is a 29 year old female with a 6.1cm right parapharyngeal space schwannoma, diagnosed after tonsillectomy, with exposed tumor in the oropharynx. The mass was anterior and medial to the internal jugular vein and internal carotid artery and eroded through the bony horizontal carotid canal. The lesion was successfully surgically resected and the oropharyngeal defect was repaired primarily. Her post operative course was complicated by a wound infection, but no CSF leak or intraoral breakdown was noted. She is now well healed.

Conclusions: This is the fourth reported case of a carotid canal sympathetic plexus schwannoma with a description of the imaging characteristics and surgical management. Parapharyngeal space tumors can be difficult to diagnose but tonsillectomy can complicate there successful treatment.

Introduction

- Schwannomas are common tumors that arise from nerve sheath Schwann cells and they can develop from any type of nerve: peripheral, cranial, or autonomic.
- Skull base schwannomas usually originate from the vestibular nerve, trigeminal nerve, vagus nerve, or cervical sympathetic chain.
- Most extracranial schwannomas in the parapharyngeal space are of vagal origin and cervical sympathetic chain schwannomas are rare; however, only 3 cases of carotid canal sympathetic plexus schwannomas are previously reported in the literature¹⁻⁴.

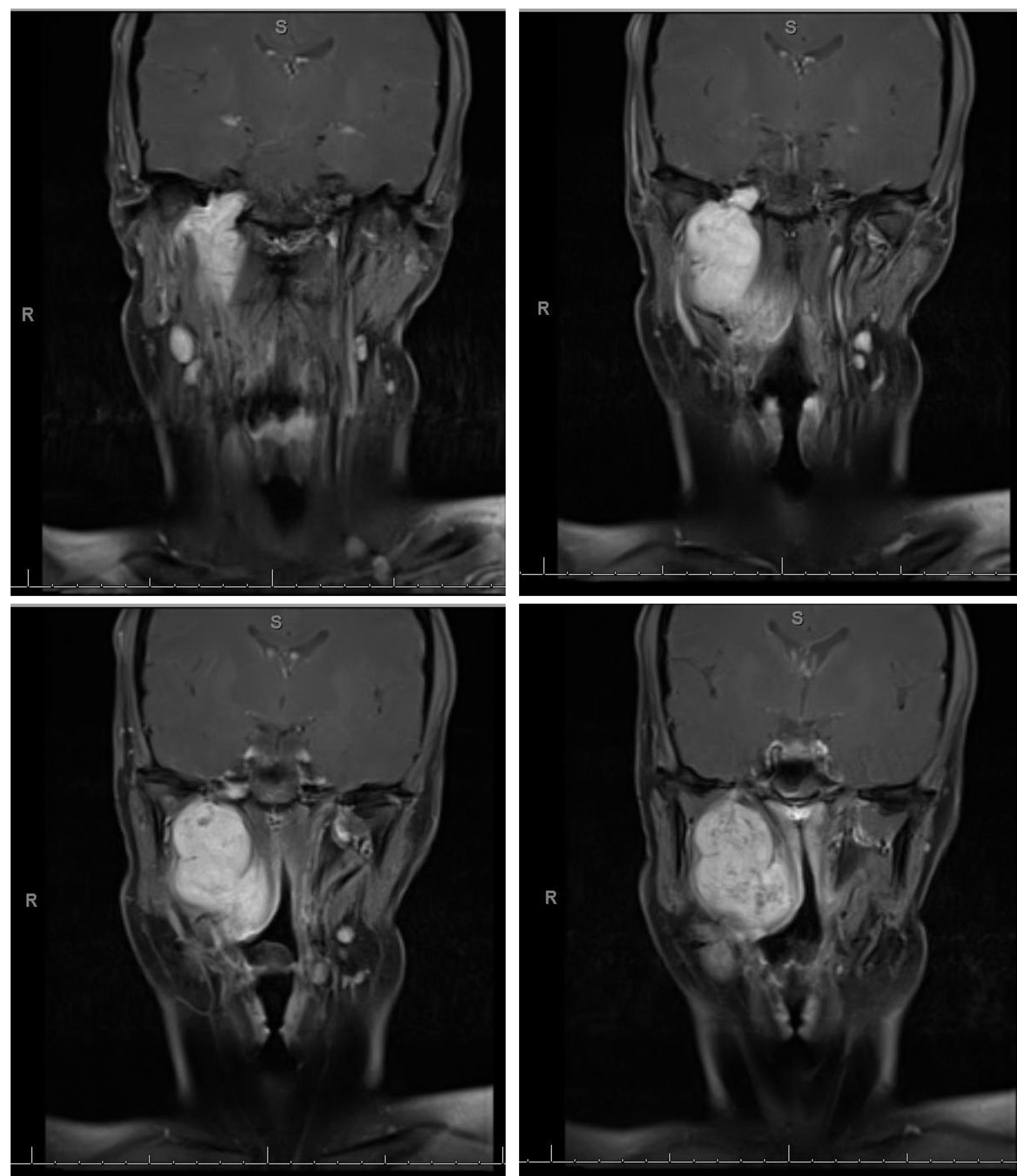


Figure 1. Coronal post-contrast fat-saturated T1 MRI images showing a mass with relatively homogeneous avid enhancement and extension from the petrous carotid canal through the skull base and into the neck.

Case Report

- 29 year old female seen for evaluation of a right parapharyngeal space mass, otherwise asymptomatic.
- Previously treated with a tonsillectomy for asymmetric tonsillar hypertrophy, which exposed the tumor to the oropharynx.
- Core biopsy demonstrates a Schwannoma.
- MRI shows a right-sided 6.1cm bland, well-circumscribed soft tissue mass with homogeneous avid enhancement in the carotid space, anterior and medial to both the internal jugular vein and internal carotid artery and with extension through the skull base into and around the horizontal segment of the carotid canal.
- CT shows a right-sided lesion with bony erosion through the skull base to involve the horizontal segment of the petrous carotid canal.
- This lesion was surgically resected through middle fossa, transcervical, and transoral approaches, it peeled off the vagus and sympathetic chain, and the oropharyngeal defect was repaired primarily.
- Post-operatively she did not develop any neuro deficits; particularly V3 numbness, unilateral vocal fold paralysis, or Horner syndrome.
- 3 weeks after the resection, she developed a neck wound infection requiring incision and drainage, hospitalization, and IV antibiotics. No evidence of CSF leak or intraoral breakdown was noted.
- She is now well healed.

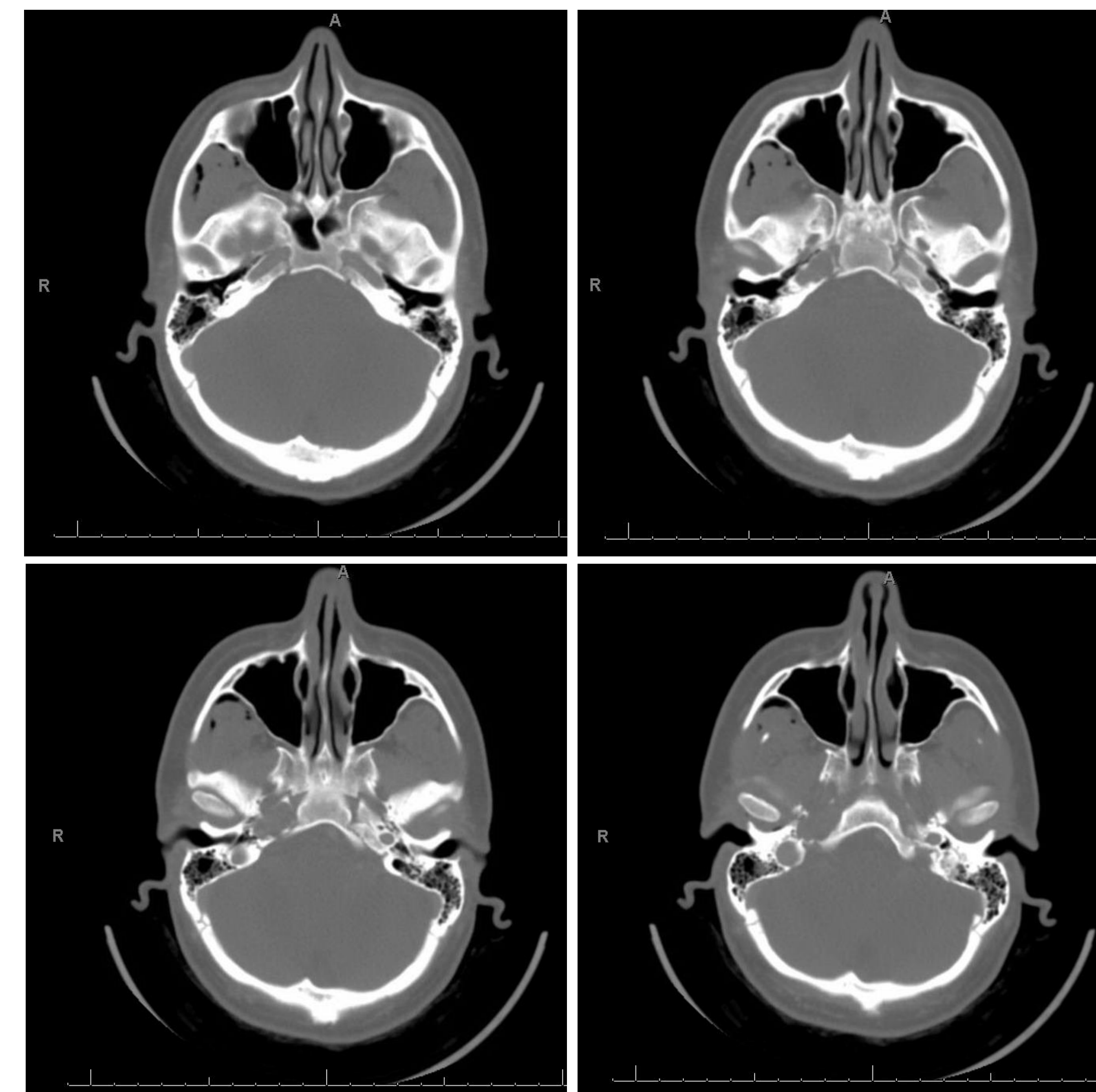


Figure 3. Axial CT images in bone window showing a bony erosive mass that smoothly enlarges and remodels the right horizontal segment of the carotid canal.

| | | Imaging Characteristics | Post Op Deficit | Erosion of the Skull Base |
|----------------------------|----------------------------------|---|-----------------|---------------------------|
| Nerve of Origin | Vagus Nerve | Tumor separates the ICA and IJV | CN X | Rare |
| | Sympathetic chain | Tumor displaces the great vessels together | Horner Syndrome | Rare |
| | Carotid Canal Sympathetic Plexus | Tumor displaces the great vessels together | None | Common |
| Carotid Space Differential | Paragangliomas | Hypervascular with salt and pepper flow voids | – | Common |
| | Schwannoma | Hypovascular, uniform and bland | – | Rare |

Table 1. Imaging characteristics of parapharyngeal space masses to help differentiate schwannomas from paragangliomas and the nerve of origin¹⁻².

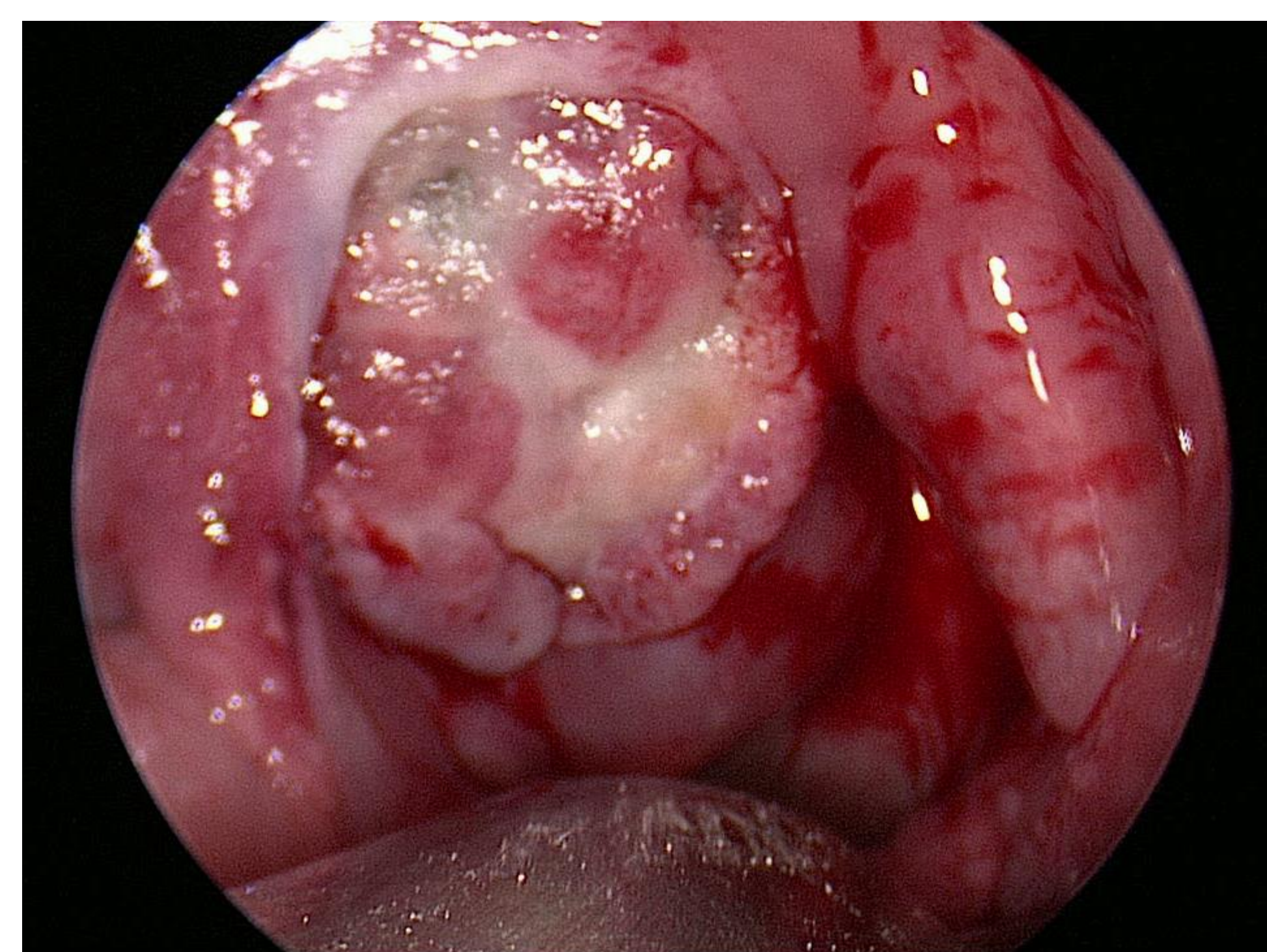


Figure 2. Oropharyngeal involvement from a carotid canal sympathetic plexus schwannoma.

Discussion

- Carotid canal sympathetic plexus schwannomas are reported in the Neurosurgical and Neuroradiology literature with 3 cases total^{3,4}.
- They have unique imaging characteristics with extension through the skull base at the horizontal petrous carotid canal, due to their origin from the sympathetic plexus nerves within the canal and the typical characteristics of Schwannomas: well circumscribed, slow-growing, with expansion of canals and foramina.
- These tumors can extend to involve the cavernous sinus and all previously reported patients presented with diplopia, however, our patient was asymptomatic at presentation without any neuro deficits.
- Post-operatively these patients did not develop a cranial nerve X deficit or Horner syndrome and all 4 reported cases of surgical resection resulted in no long-term morbidity or neuro deficit.
- Carotid space and parapharyngeal space masses are often asymptomatic and dysphagia is the most commonly reported symptom and unilateral tonsillar hypertrophy or a neck mass are the most common physical exam finding⁵.
- The differential diagnosis of parapharyngeal masses include tumors of salivary gland origin, vascular masses, neurogenic masses, lymphadenopathy, or other very rare malignant and benign entities and without skull base involvement they can often be resected through a transcervical approach.
- Exposing a parapharyngeal tumor to the oral cavity likely increases the risk of wound infection and potential skull base and intracranial complications.

Conclusions

Carotid canal sympathetic plexus schwannomas are very rare but occur and their diagnosis, operative photo, and imaging is reviewed. Parapharyngeal space tumors are on the differential for asymmetric tonsillar hypertrophy and tonsillectomy can complicate their successful management.

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