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**Radiology**

# Trigeminal Neuroma: A Case Report and Review of the Literature

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**Abstract** **Case Report**

Trigeminal neuromas are rare tumors arising from the trigeminal nerve, often presenting diagnostic challenges due to their infrequent occurrence and varied clinical manifestations. We present a case report of 52 year-old female patient presenting with right diplopia and progressive facial pain resistant to standard treatment. Early recognition and appropriate management are crucial to prevent complications and improve patient outcomes. This report underscores the importance of considering trigeminal neuromas in the differential diagnosis of facial pain and the pivotal role of imaging modalities in guiding clinical management decisions.

**Keywords:** Trigeminal neuromas, case report, tumor, diagnosis.



## INTRODUCTION

The trigeminal schwannoma is a benign tumor, initially described by SMITH in 1938, originating from Schwann cells in various segments or branches of the trigeminal nerve. Trigeminal schwannomas, accounting for a small percentage of intracranial tumors and schwannomas, typically arise from the trigeminal nerve's various segments. Clinical presentation often includes facial pain, numbness, and paresthesia corresponding to affected trigeminal nerve divisions. Magnetic resonance imaging (MRI) serves as the gold standard for diagnosis due to its multiplanar. The management of this tumor involves collaboration between otolaryngologists and neurosurgeons throughout its diagnostic and therapeutic phases.

## CASE REPORT

We present the case of a 52 year-old female patient, with no significant medical history, who presented with right diplopia for one month with facial pain resistant to standard treatment, with no other apparent abnormalities, no fever, or general malaise.

Further investigations confirmed the presence of an extra-axial right tumor.

Consequently, a cranial MRI were requested, revealing an right expansive cystic – solid extra-axial pontocerebellar angle tumor involving the right cavernous sinus and extending into the posterior cranial fossa.

The tumor mass show minimal heterogenous enhancement post-contrast injection. The diagnosis of trigeminal nerve neuroma was considered. The patient was informed about the goals and potential consequences of surgery, and after obtaining its consent he was taken to the operating room. Histological examination confirmed the diagnosis of cystic trigeminal schwannoma.

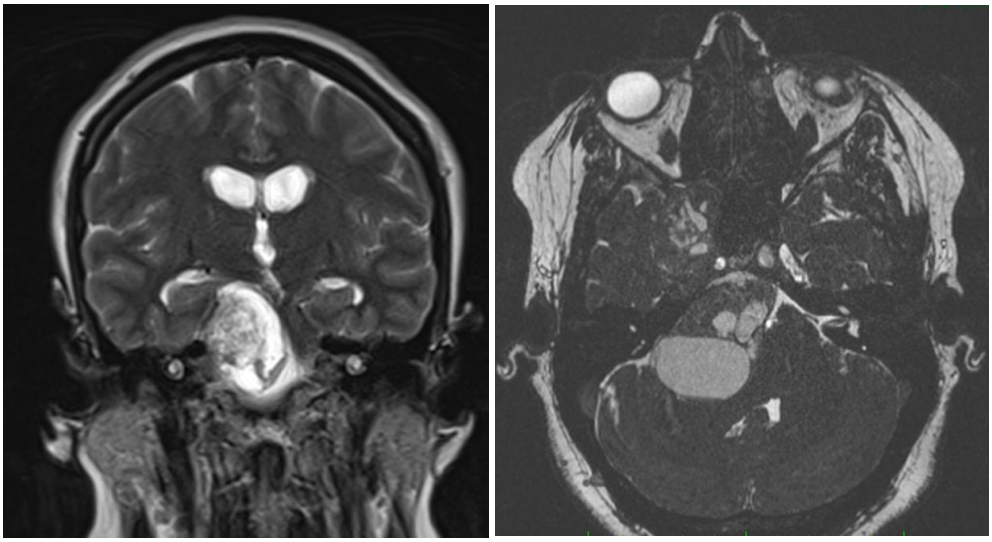

**Fig. 1: T2 (coronal) and Ciss (axial) sequences: Solid-cystic lesion process of the right cerebellopontine angle extending into the posterior cranial fossa and along the expected course of the trigeminal nerve**

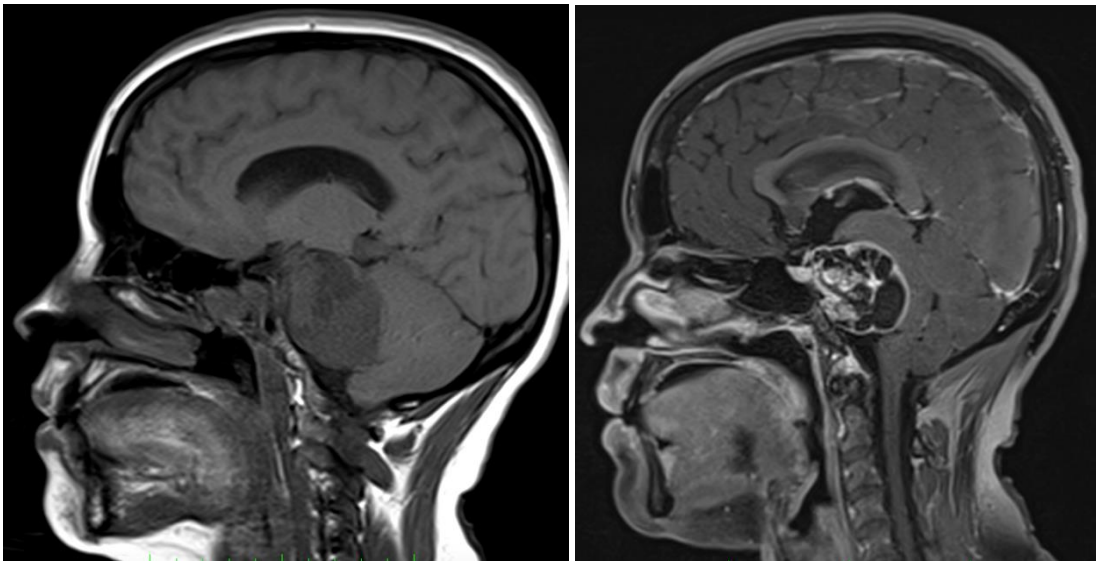

**Fig. 2: T1(sagittal) before and after gadolinium injection showing heterogeneous enhancement of the mass**

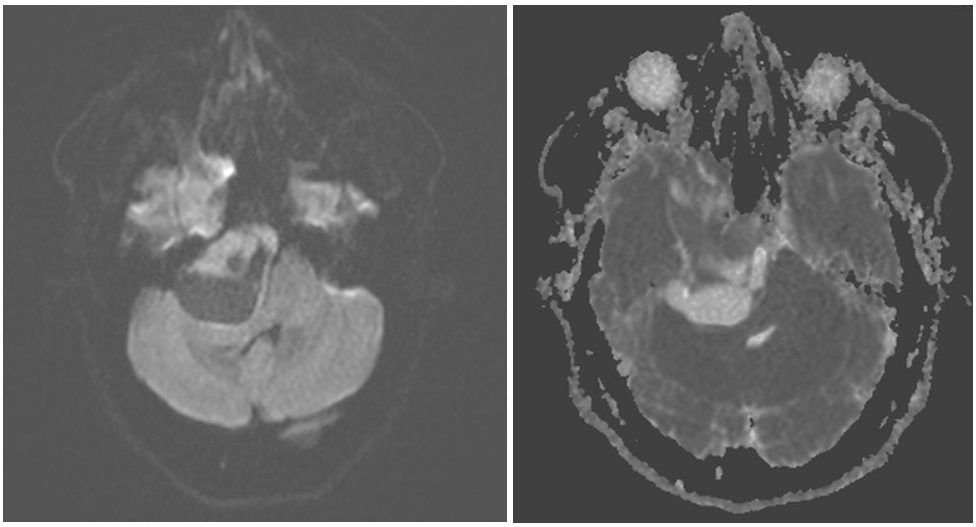

**Fig. 3: DWI sequences and ADC (Apparent Diffusion Coefficient) mapping show no diffusion hyperintensity within the lesion**

## DISCUSSION

The trigeminal nerve, the largest cranial nerve, serves as a mixed sensory-motor pathway, transmitting sensory signals from the face and providing motor function to the muscles involved in chewing. This nerve is anatomically segmented into five regions: intra-axial, cisternal, Meckel's cave and cavernous sinus, skull base, and extra-cranial segments. Within Meckel's cave, the Gasserian or semilunar ganglion gives rise to three primary branches: ophthalmic, maxillary, and mandibular.

Trigeminal schwannomas are uncommon tumors, comprising only 1–2% of all intracranial schwannomas. They typically manifest in individuals aged between 50 and 60 year old, with a slightly higher incidence among females. These tumors are benign in nature and progress slowly over time. Most frequently, they originate from the cisternal segment and gradually enlarge along the trajectory of the nerve. Clinically, patients typically exhibit symptoms of trigeminal nerve dysfunction.

The most prevalent symptom of trigeminal schwannomas is typically facial pain.

Additional typical clinical presentations encompass Sensations of numbness or burning along the nerve's distribution or within one of its branches. In instances of prolonged tumor presence, individuals may also encounter motor symptoms like challenges with chewing and deviation of the jaw.

Imaging techniques play a crucial role in both diagnosis and pre-surgical planning. MRI stands as the preferred imaging modality aiding in localization, anatomical assessment, and selection of the surgical approach. Various classifications exist based on tumor location and extension.

Typically, tumors appear isointense or hypointense on T1-weighted MRI images and hyperintense on T2-weighted images, exhibiting avid enhancement following contrast administration. At times, lesions might appear as a combination of solid and cystic components or predominantly cystic on imaging. Alongside routine MRI sequences, obtaining thin T2-weighted CISS 3D axial sequences becomes crucial for patients suspected of having trigeminal nerve lesions, as it improves the assessment of the nerve's cisternal segment.

CT scanning serves as a supplementary tool to MRI imaging, particularly for tumors situated in the skull base. On CT scans, trigeminal schwannomas typically manifest as uniformly enhancing masses accompanied by remodeling of adjacent bone structures.

Definitive diagnosis requires histopathological examination, typically revealing dense Schwann cell tissue. Treatment options include surgical resection or radiotherapy, tailored to individual cases.

## CONCLUSION

Trigeminal schwannoma, though benign, poses challenges due to its anatomical complexity and potential for complications from surgery or radiotherapy, requiring a multidisciplinary approach for optimal management. Long-term clinical and radiological surveillance is essential to monitor for recurrence. Advances in clinical imaging facilitate early diagnosis and post-therapeutic monitoring, improving patient outcomes.

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