

# An Isolated, Giant Infratemporal Fossa Schwannoma: Removal By Transmandibular Transpterygoid Approach

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## Abstract

A rare case schwannoma of infratemporal fossa (ITF) is presented. Trigeminal schwannomas are commonly located intracranium, and extra cranial schwannomas limited to the ITF, are extremely rare. A 19-year-old female who presented with left facial pain since 4 years. She had trismus and swelling in preauricular and temporal fossa region since 1 year and was diagnosed as a case of schwannoma in ITF. The schwannoma was completely removed by transcervical transmandibular transpterygoid approach without any complication, with complete relief of symptoms. Trigeminal schwannomas in ITF are quite rare. Its way of presentation and surgical approach in such type of case is discussed.

## INTRODUCTION

Nerve sheath tumors were first described in 1910 by Verocay<sup>1</sup>. Peripheral benign neurogenous tumors include neuroma, neurofibroma, schwannoma and granular cell tumor. Schwannoma is a benign, slow growing encapsulated tumor that originates from the schwann cells sheathing the peripheral motor, sensory and cranial nerves except first and second cranial nerve. Schwannoma of head and neck comprise 25%-40% of all schwannomas<sup>2</sup>. The majority of schwannoma occurs in parapharyngeal space but schwannoma arising from the ITF is very rare. We represent one case of ITF schwannoma to describe the mode of presentation, clinical and radiological findings, histopathologic identification and various surgical approaches.

## CASE REPORT

A 21-year-old female presented to us complaining of pain and tightening sensation in left side of face of 4 years duration associated with fullness in preauricular and temporal region and difficulty in opening of mouth of one-year duration. Local examination revealed an ill-defined tender mass in preauricular and temporal region and trismus. Computerized tomography (CT) (fig-1) and magnetic resonance imaging (fig-2) showed a well-defined mass of 4x3cm in size with heterogeneous enhancement in the left ITF.

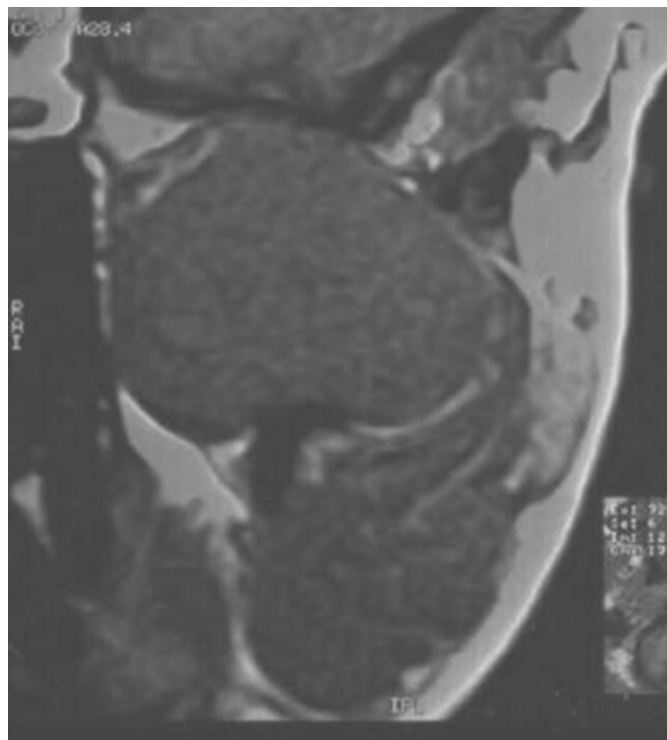
## Figure 1

Figure 1: Contrast enhanced computerized tomography (CT) axial section showing a well-encapsulated mass with heterogeneous enhancement in the left infratemporal fossa.



**Figure 2**

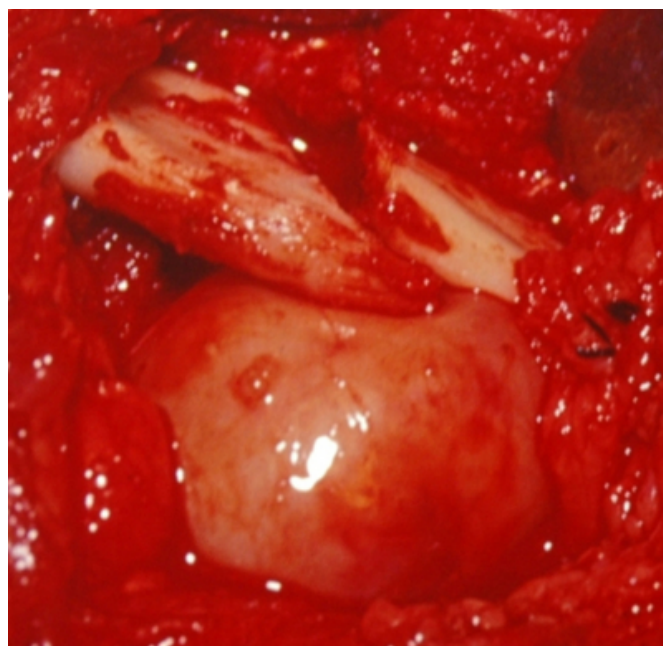
Figure 2: Contrast enhanced magnetic resonance imaging coronal section showing contrast enhanced mass in left infratemporal fossa.



The tumor was extending into the left temporal fossa superiorly, parapharyngeal space inferiorly and there was widening of mandibular notch. CT guided fine needle aspiration cytology of the mass was performed which revealed the diagnosis of schwannoma. The tumor was excised by transmandibular transpterygoid approach (inferior approach) under general anesthesia. A modified Blair's incision combined with horizontal incision in the skin crease was made two fingers breadth below the angle of mandible. A subplatysmal flap was elevated. The submandibular gland was retracted anteriorly and the angle and parts of the mandible were exposed and osteotomy made immediately anterior to the ascending ramus. The ascending ramus was everted upward and laterally to facilitate the access to the tumor (fig-3).

**Figure 3**

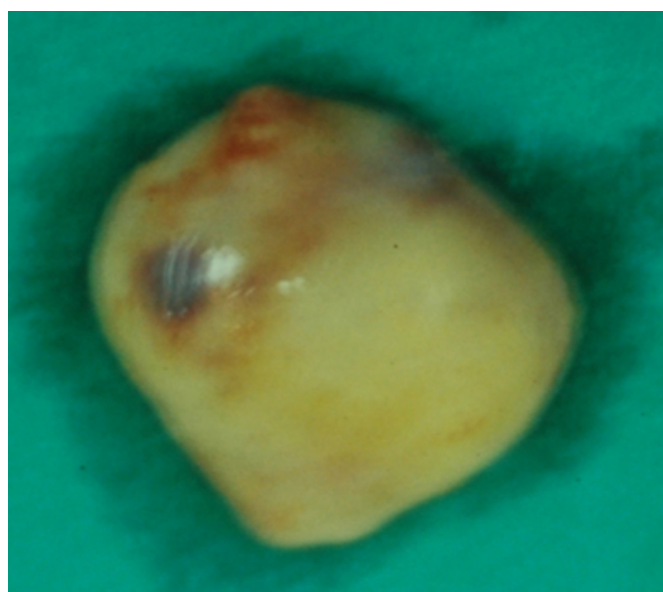
Figure 3: Intraoperative photographs showing mandibular osteotomy with tumor in situ.



After cutting pterygoid muscles the tumor was freed from surrounding tissue and removed in toto and sent for histopathological examination. The tumor measuring 5x5 centimeter, was firm, well encapsulated, smooth, globular, glistening, greyish white in colour (fig-4).

**Figure 4**

Figure 4: Clinical photograph of the well encapsulated tumor.



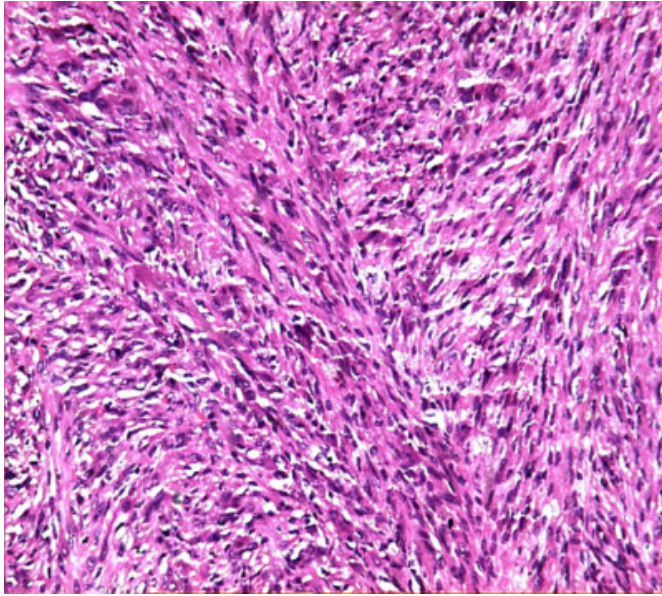
Cut surface was greyish white, firm with areas of softening. Histological examination revealed a spindle-celled



proliferation with nuclear palisading and veruocay body formation confirmed the diagnosis (fig-5).

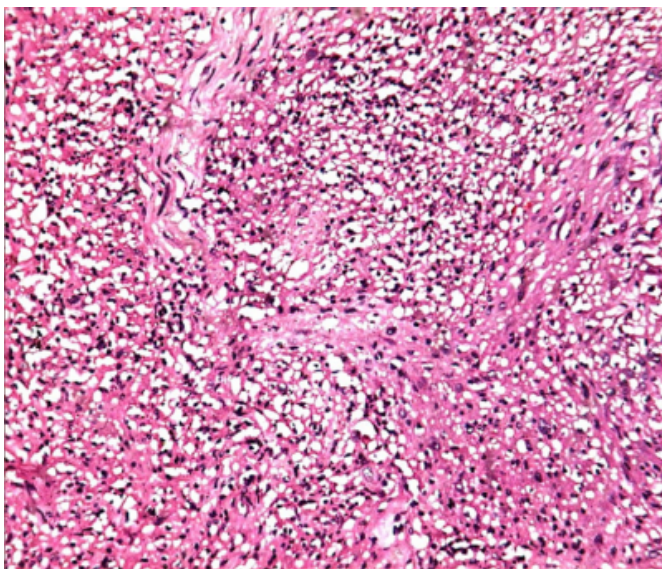
**Figure 5**

Figure 5a: Microscopically, hypercellular areas of spindle-shaped cells with nuclear palisading-Antony-A pattern (hematoxylin eosin stain; original magnification x 100).



**Figure 6**

Figure 5b: Microscopically, hypocellular areas of spindle-shaped cells, loose, lacking arrangement in bundles and pallisading-Antony-B pattern (hematoxylin eosin stain; original magnification x 100).



The tumor showed diffuse positive reactivity for S-100 protein on immunological staining. After removal of tumor the mandibular frgments were wired together and wound

was drained with a negative suction drain and closed in 2 layers. The postoperative period was uneventful and the patient is on regular follow up and was asymptomatic 4 months after surgery.

**DISCUSSION**

The ITF is a specific anatomic region situated deep to the ramus of the mandible. The contents of ITF are pterigoid muscles, parts of temporalis muscle with its tendon, internal maxillary vessel, pterygoid plexus of veins, mandibular and maxillary nerves with their branches. It is a clinically hidden area. Tumors arising in this clinically silent area reach considerable size before producing symptoms or becoming evident on clinical examination<sup>3</sup>. Schwannoma is a benign nerve sheath tumor. This tumor is encapsulated and presented as a solitary mass with benign behavior. The synonyms of schwannoma are neurinoma, peripheral fibroblastoma, neurolemmoma and neurilemmoma. The tumor contains histologically two different areas, which are classified as antoni types. Cells of antoni-A variety display a tendency to align their nuclei in a palisading pattern and to pool their fibrillary cytoplasm with resultant creation of structures known as veruocay bodies which are characteristic of a schwannoma. In contrast the antoni-B pattern is less cellular, loose, lacking arrangements in bundles and palisades. Antoni-B areas are more prone to degeneration, cyst formation and the superimposition of inflammatory changes.

Immunohistochemistry of schwannoma shows reactivity for S-100 protein. Schwannomas are more common in females and frequently seen in 30-40 years of age<sup>4, 5</sup> where as our case was a 17-year-old female when the symptoms started appearing. Clinically schwannoma presents with symptoms related to the nerve from which it arises. Pain associated with fullness in ipsilateral face is the most common presenting symptoms of schwannoma as in our case. Other symptoms and signs of ITF schwannoma are swelling in preauricular and temporal areas, trismus and paresthesia. CT scan demarcates the extension of mass showing features of a benign, slow growing tumor. Characteristic findings of ITF schwannoma on CT scan includes the absence of an infiltrative pattern, a spherical lesion lying medial to ascending ramus of mandible, no bony erosion and slight heterogenous enhancement with contrast. Although, diagnosis can not be made by CT-scan but it will differentiate schwannoma from other vascular lesions. Surgical excision is the treatment of choice because of their

benign nature and radioresistance.<sup>4</sup>

Various surgical approaches to ITF have been described. The commonly used approaches<sup>6</sup> to the ITF are Caldwell-luc, lateral and transcranial. Other approaches are inferior, extradural zygomatic middle fossa approach, subtemporal infratemporal approach and orbitozygomatic extradural approach. The Caldwell-luc approach provides limited exposure and can be modified by incorporating either a weber-fergussion incision or by use of trans-oral approach to expose more of the maxilla. Lateral approaches require a standard parotidectomy skin incision with a preauricular extension and dissection of the parotid gland and facial nerve. Transcranial approaches, such as frontotemporal craniotomy, are also described. The transmandibular transpterygoid approach<sup>7</sup> (inferior approach) utilizes a horizontal transcervical incision with modified Blair's incision to expose mandible for osteotomy and medial pterygoid muscle was incised to get access to ITF for tumor excision. It provides a direct and head on wide exposure to ITF and can be combined with division of zygomatic arch for excision of large size tumors.

Given the radiographic and clinical findings, the tumor of present case was believed to be benign. So this inferior approach was used to excise the tumor, as the tumor was bigger in size and going to temporal fossa. It was approached easily after mandibular osteotomy and was dissected bluntly with adjacent tissue. At postoperative follow up, all of the symptoms, including facial swelling and pain had improved. No complications were noted after a follow up of 6 months.

## CONCLUSION

This article describes a case of ITF schwannoma which is a rare, slow growing, benign neurogenic tumor that produces symptoms mainly due to its mass effect and dysfunction of nerve of origin. It can be excised through different approaches. The current case represents the typical presentation, examination findings, radiological characteristics, histopathologic identification and surgical management of such a lesion.

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