

Ancient Schwannoma of the Infratemporal Fossa with Parapharyngeal Extension: A Case Report and Review of Recent Literature

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Abstract

Introduction and Importance: Schwannomas are benign nerve sheath tumors that may arise in deep anatomical regions such as the infratemporal fossa and parapharyngeal space. Their slow growth and nonspecific presentation often delay diagnosis. Ancient schwannoma is a rare histological variant characterized by degenerative changes that may mimic malignancy. **Case Presentation:** We report the case of a 64-year-old man presenting with progressive left parotid swelling and long-standing hemifacial paresthesia. Imaging revealed a giant infratemporal fossa tumor with parapharyngeal extension. Complete surgical excision was achieved via a superior vestibular approach with maxillo-malar osteotomy. Histopathology confirmed an ancient schwannoma. No recurrence was observed at one-year follow-up. **Clinical Discussion:** Management of large infratemporal schwannomas remains challenging due to their deep location and proximity to critical neurovascular structures. Surgical approach selection must be individualized according to tumor extension. **Conclusion:** This case highlights the importance of accurate histopathological diagnosis and tailored surgical planning in the management of giant ancient schwannomas of the infratemporal fossa.

Keywords

Schwannoma, Infratemporal Fossa, Parapharyngeal Space, Parotid Mass, Nerve Sheath Tumor

1. Introduction

Schwannomas are benign, slow-growing tumors arising from Schwann cells of peripheral, cranial, or autonomic nerves. In the head and neck region, they represent

approximately 25% - 45% of extracranial schwannomas, with the parapharyngeal space and infratemporal fossa (ITF) being uncommon but surgically challenging locations due to their deep anatomical position and proximity to major neurovascular structures (Samal et al., 2020; Bin-Alamer et al., 2022).

ITF schwannomas most frequently originate from branches of the trigeminal nerve, particularly the mandibular division (V3). Clinical presentation is often insidious, including facial paresthesia, hypoesthesia, preauricular pain, or parotid-region swelling, which may delay diagnosis until the tumor reaches a large size (Bin-Alamer et al., 2022; Alafaci et al., 2013).

Ancient schwannoma is a rare histological variant associated with long-standing tumors. It is characterized by marked degenerative changes such as cystic degeneration, stromal hyalinization, hemorrhage, and nuclear atypia without increased mitotic activity. These features may mimic malignancy on imaging and histopathological examination, emphasizing the need for careful diagnostic interpretation (Samal et al., 2020; Alafaci et al., 2013).

Complete surgical excision remains the treatment of choice. However, the selection of the optimal surgical approach—endoscopic, open, or combined—depends on tumor size, extension into adjacent spaces, particularly the parapharyngeal space, and the relationship with surrounding neurovascular structures (Alafaci et al., 2013; Maheshwari et al., 2012; Agosti et al., 2022; Cao et al., 2024). We report a rare case of a giant ancient schwannoma of the infratemporal fossa with parapharyngeal extension and discuss its management in light of current literature.

2. Case Presentation

A 64-year-old retired man presented with a progressive left parotid swelling evolving over four months, associated with a two-year history of left hemifacial paresthesia. There was no facial nerve dysfunction, trismus, dysphagia, or cutaneous involvement. Physical examination revealed a firm, painless mass, mobile relative to the underlying structures.

2.1. Imaging Findings

Contrast-enhanced computed tomography demonstrated a well-defined mass located in the left pterygomaxillary and infratemporal fossa, measuring 86 mm in maximal diameter. Magnetic resonance imaging revealed a heterogeneous lesion with extension into the ipsilateral parapharyngeal space, displacing the pterygoid muscles and narrowing the pharyngeal lumen. These imaging characteristics were suggestive of a benign peripheral nerve sheath tumor. MRI is considered the imaging modality of choice for infratemporal schwannomas, allowing accurate assessment of tumor extent, internal architecture, and relationships with adjacent neurovascular structures (Pilavaki et al., 2004).

Angio-computed tomography showed a moderately vascularized, encapsulated mass without evidence of major vascular invasion, contributing to surgical plan-

ning. Imaging features are illustrated in **Figure 1** and **Figure 2**.

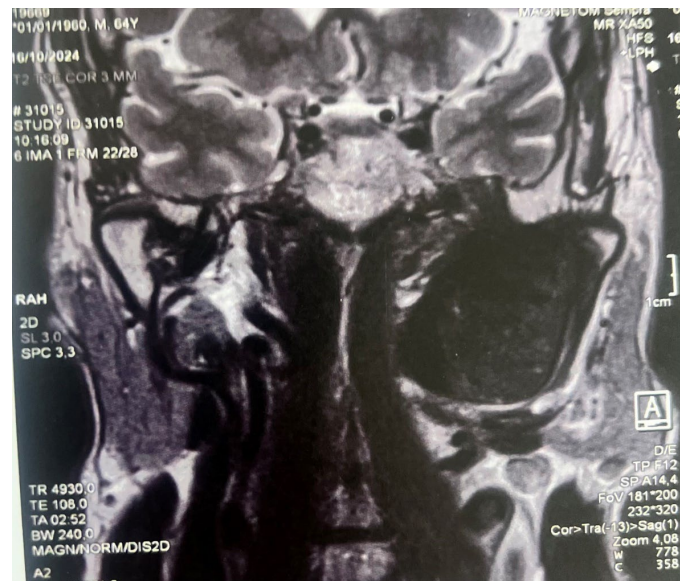


Figure 1. Coronal section of a parotid MRI showing a lesion centered in the left infratemporal fossa with extension into the ipsilateral parapharyngeal space.

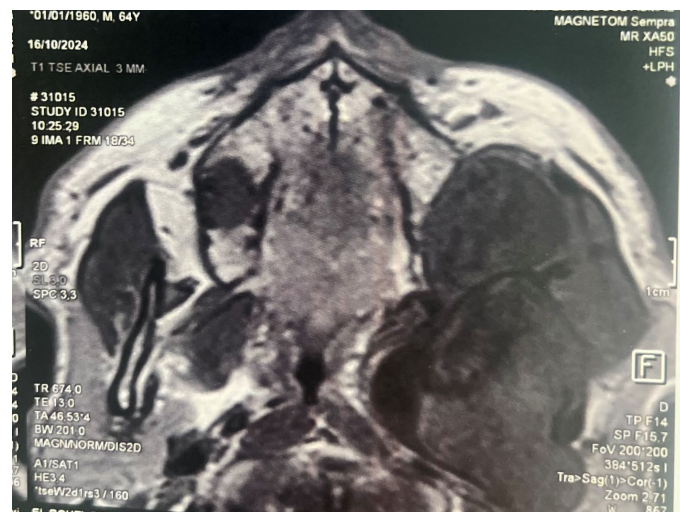


Figure 2. Axial section of a parotid MRI showing the tumor's relationships with the posterior wall of the maxillary sinus, displacement of the ipsilateral pterygoid muscles, and medial extension toward the mucosal pharyngeal space, resulting in narrowing of the pharyngeal space.

2.2. Surgical Intervention

Surgical excision was performed via a superior vestibular approach combined with a maxillo-malar osteotomy. This approach was selected due to the large tumor size and its significant extension into the parapharyngeal space, which limited the feasibility and exposure offered by purely endoscopic or lateral approaches described for smaller or more medially located lesions (Agosti et al., 2022; Cao et al., 2024).

Intraoperatively, the tumor was well encapsulated and displaced adjacent structures without infiltration. Although the tumor location strongly suggested a trigeminal nerve origin, the exact nerve of origin could not be clearly identified due to tumoral expansion and compression of surrounding tissues. No functional nerve fibers were intentionally sacrificed. Careful extracapsular dissection allowed complete en bloc tumor removal. The resected specimen is shown in **Figure 3**.



Figure 3. Operative specimen after en bloc excision of the tumor via a vestibular approach.

2.3. Histopathological Findings

Microscopic examination revealed a well-encapsulated tumor composed of alternating Antoni A and Antoni B areas. Antoni A regions showed spindle-shaped cells arranged in palisading patterns, while Antoni B areas were hypocellular with a loose myxoid stroma. Prominent degenerative changes were observed, including stromal hyalinization, cystic degeneration, focal hemorrhage, and nuclear atypia without mitotic activity. Immunohistochemical analysis demonstrated strong and diffuse positivity for S-100 protein. These findings were consistent with the diagnosis of ancient schwannoma ([Samal et al., 2020](#)).

2.4. Follow-Up

At one-year follow-up, contrast-enhanced magnetic resonance imaging demonstrated no residual tumor or evidence of recurrence.

3. Discussion

Schwannomas of the infratemporal fossa are rare entities, most frequently arising from the mandibular branch of the trigeminal nerve ([Bin-Alamer et al., 2022](#); [Alafaci et al., 2013](#)). Their slow growth and deep location often result in delayed diagnosis and large tumor size at presentation. Ancient schwannomas represent a distinct histological subtype associated with long-standing lesions and marked degenerative changes, which may simulate malignant tumors if not carefully inter-

preted (Samal et al., 2020).

Tumor size is a major determinant of surgical strategy and outcome in trigeminal schwannomas. Recent multicenter studies have shown that large tumors frequently require open or combined approaches to achieve gross-total resection while minimizing neurological morbidity (Choucha et al., 2024; Dwarakanath et al., 2024).

Various surgical approaches to the infratemporal fossa have been described, including endoscopic, transfacial, transmandibular, and combined techniques (Alafaci et al., 2013; Maheshwari et al., 2012; Agosti et al., 2022; Cao et al., 2024). Osteoplastic approaches, such as maxillotomy and maxillo-malar osteotomy, provide wide exposure of the infratemporal compartment with acceptable functional and cosmetic outcomes. Karkas et al. highlighted the usefulness of these approaches for complete resection of benign infratemporal tumors while preserving surrounding neurovascular structures (Karkas et al., 2008).

In the present case, the superior vestibular approach with maxillo-malar osteotomy allowed safe en bloc excision of a giant tumor with parapharyngeal extension, supporting the relevance of tailored open approaches in selected extensive lesions.

A comparison with previously reported cases of infratemporal fossa schwannomas is summarized in Table 1. Most published cases describe smaller tumors managed through lateral or endoscopic approaches, whereas large tumors with parapharyngeal extension, such as in the present case, often require open or combined surgical approaches.

Table 1. Comparison of published cases of infratemporal fossa schwannomas (ITF = infratemporal fossa; PPS = parapharyngeal space; CWL = Caldwell–Luc; MM = maxillo-malar; NED = no evidence of disease; M = male; F = female).

Author (Year)	Age/Sex	Nerve origin	Size (cm)	Approach	Extension	Ancient variant	Outcome
Samal et al., 2020	45/M	V3	6	Transcervical	ITF only	Yes	NED
Alafaci et al., 2013	52/F	Trigeminal	8.5	Transzygomaxillary	ITF + PPS	No	NED
Maheshwari et al., 2012	38/M	V3	5	Transmaxillary osteotomy	ITF	No	NED
Agosti et al., 2022	49/F	V3	4.2	Endoscopic + sublabial	ITF + PPS	No	NED
Cao et al., 2024	60/M	Unknown	5.5	Prelacrimal + CWL	ITF	No	NED
Choucha et al., 2024	Multicenter	Trigeminal	>3	Open/combined	Variable	No	Variable
Present case, 2024	64/M	V3 (presumed)	8.6	Vestibular + MM osteotomy	ITF + PPS	Yes	NED 1 yr

Abbreviations: ITF = infratemporal fossa; PPS = parapharyngeal space; NED = no evidence of disease; MM = maxillo-malar; CWL = Caldwell–Luc.

4. Conclusion

Ancient schwannoma of the infratemporal fossa is a rare benign tumor that poses diagnostic and surgical challenges due to its deep location and potential for large size. Accurate histopathological diagnosis and individualized surgical planning

are essential to achieve complete resection and favorable outcomes.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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