

Case Report

A rare case of schwannoma of the mandibular nerve extending to parapharyngeal space managed with a preauricular trans mandibular approach

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ABSTRACT

Schwannoma also referred to as neurilemmoma or neurinomas arise from the Schwann cells of the autonomic nerves, peripheral nerves and cranial nerves except optic and olfactory nerves. Head and neck schwannomas account for 25 to 45% of schwannomas and the most common being vagal schwannomas and cervical sympathetic chain schwannomas. Schwannomas arising from the trigeminal nerve are rare and this case report consists of a schwannoma presenting as a left preauricular swelling involving the region of parotid extending from foramen ovale through the infratemporal fossa up to the parapharyngeal space. A combined preauricular trans mandibular approach enabled a complete excision of the tumor. Histopathological confirmation of a benign schwannoma was obtained and the patient is feeling well with minimal postoperative facial palsy with no trismus, occlusion abnormalities and no signs of recurrence on follow up.

Keywords: Schwannoma, Transmandibular approach, Parotid tumor

INTRODUCTION

Schwannomas are usually benign, well encapsulated perineural tumors of neuroectodermal origin with an indolent progression unless associated with malignancy. About 4% of head and neck schwannomas present as a sinonasal schwannoma. A preoperative diagnosis of schwannoma is essential as excision of schwannoma is associated with higher degrees of nerve palsy due to the close proximity to the tumor.¹ Fine needle aspiration for cytological analysis under image guidance aids in pathological confirmation of schwannoma. MRI remains as the radiological imaging of choice for delineating the extent of tumor and the relationship with adjacent vital structures and also aids in identification of the nerve of origin based on the possible enlargement or widening of the specific anatomical spaces and foramina. The course

of the swelling through the masticator space with widening of the foramen ovale as in our case suggests the nerve of origin to be trigeminal nerve. Though various techniques have been described for the approach to infratemporal fossa and masticator space including the trans-maxillary trans-mandibular, trans zygomatic the approach, a preauricular trans-mandibular with an extended parotidectomy including a sagittal parasymphiseal access osteotomy of the mandible was done in our case following which tumor was excised in toto.

CASE REPORT

A 40-year-old gentleman with a non-contributory medical history was referred to our department with a painless progressive swelling over the region of left parotid over a

duration of 8 years with no evidence of neurological deficit.



Figure 1: Preoperative image of a swelling in the region of the left preauricular region.

The patient had a history of misdiagnosis as a parotid tumor and underwent a surgery which ended up as an incisional biopsy of the tumor 4 years back. The biopsy turned out to be a schwannoma and was advised excision. The patient presented with painless, progressive swelling ever since the biopsy (4 years later). The swelling had increased in size compared to previous imaging, however there was no neurological deficit. Magnetic resonance imaging (MRI) revealed a well-defined multi lobulated T1 iso intense, T2 mixed intense predominantly hyperintense lesion 3 cm (anteroposterior), 6.9 cm (transverse), 4.5 cm in the region of left parotid, parapharyngeal, masticator space causing widening of left stylomandibular space and foramen ovale with the following extensions. Superiorly the swelling extended through the foramen ovale and inferiorly it extended upto ramus of the mandible. Anteriorly the swelling was associated with anterolateral displacement of pterygoids. Postero-laterally the swelling was limited by the mastoid, displacing the left parapharyngeal fat medially and the parotid laterally and postero-medially the swelling was in close relation to the internal carotid artery.

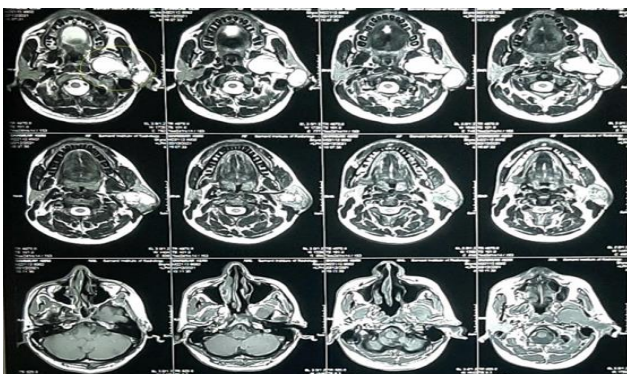


Figure 2: MRI of head and neck showing a swelling in left masticator space extending from foramen ovale.

A multidisciplinary approach involving a team of general surgeons, oral and maxillofacial surgeons, vascular surgeons along with neurosurgeons was planned. Nasal intubation was done and a combined preauricular trans-mandibular approach was done with a preauricular incision extending to the neck. Total conservative parotidectomy was done with careful dissection and delineation of the Facial nerve branches. Pressure atrophy of the left parotid was noted intraoperatively. Following parotidectomy, the superficial part of the tumor was mobilized. Further access to the tumor required an access sagittal para-symphyseal mandibular osteotomy. Initial Osteotomy cuts were placed between 33 and 34 regions from the lower border of mandible. Pre fixation was done with stainless steel miniplates and screws. After the osteotomy cuts were completed, mandibular access was obtained by retracting the posterior border of ramus freely. The mandibular osteotomy was curated to not distort the dental architecture with incisions through the inter-dentine region to prevent postoperative malocclusion. The pterygoid muscles were cut and the pterygo mandibular sling was disrupted to provide access to the superior portion of the tumor in the masticatory and infratemporal fossa. The tumor was also mobilized and complete excision of the tumor was done including the tumor encroaching the parapharyngeal part. Arch bars were placed, mandible was reduced and Intermaxillary fixation was done and fixation done with 2x4-hole mini plate, and 2x8 mm screws in number. IMF wires were released and lingual splints were placed to aid normal occlusion and continuity of lingual cortex. Pterygomandibular sling was restored and the wound was closed over suction drains. Patient was electively extubated 24 hours later. There was no requirement for a tracheostomy and the patient was initiated on nasogastric feeds. Postoperatively the patient developed minimal deviation of the left angle of mouth and was started on steroids. Physiotherapy was also initiated.

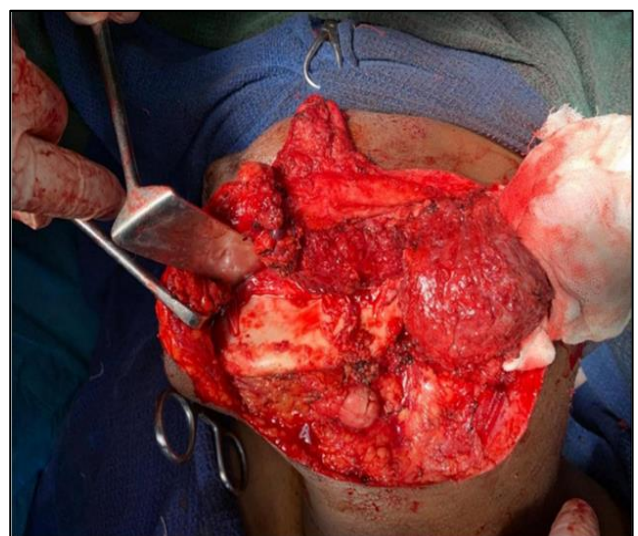


Figure 3: Intra-operative picture with the mobilized superficial part of the schwannoma. Mandible is exposed.

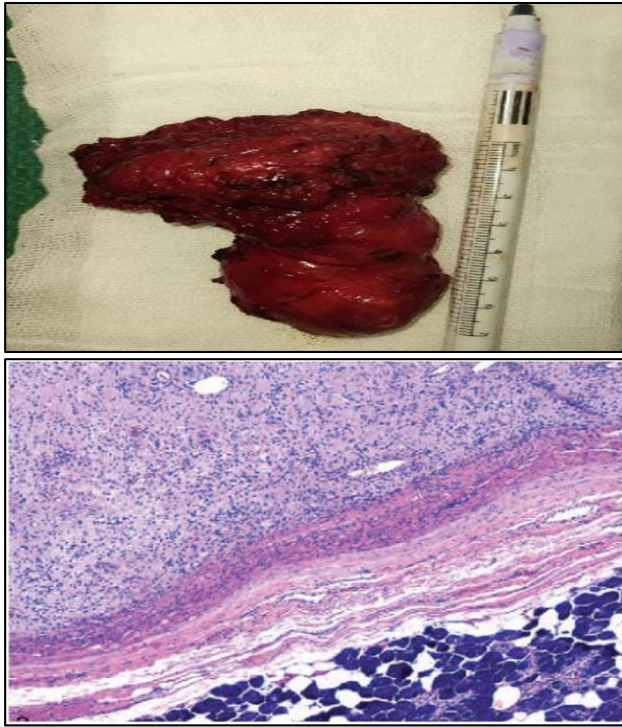


Figure 4: Resected tumor in total and histopathological picture of features of parotid schwannoma.

DISCUSSION

Schwannomas are benign peripheral nerve sheath tumors. They originate from any nerve covered with schwann cell sheath.¹ Schwannomas tend to have a syndromic predilection with type I and type II neurofibromatosis. In such cases schwannomas are multiple. Malignant transformations of schwannomas are rare and malignant peripheral nerve sheath tumors arise de novo and have a higher incidence in patients with neurofibromatosis.

The incidence of trigeminal nerve schwannomas are rare and accounts to about 0.07 to 0.36 of all intracranial tumors.² Schwannomas may have an antegrade involvement in which progression is from the main trunk to involve the branches or there can be a retrograde involvement from the branches to main trunk. Although any location innervated by the mandibular nerve (V3) may show retrograde peripheral nerve schwannoma to the main trunk of the nerve the auriculotemporal nerve and the inferior alveolar nerve are the most commonly involved branches.⁴ The auriculotemporal nerve arises from V3 immediately below the foramen ovale. It provides cutaneous innervation to the lateral and upper face. Some of its terminal branches communicate with the facial nerve within the parotid gland, where it supplies parasympathetic innervation to the gland.

The widely accepted imaging modality remains MRI for head and neck schwannomas due to better soft tissue delineation while a CT offers better detailing of the

adjacent bone. On unenhanced CT the lesion has soft-tissue density while on MRI it is isointense or slightly hypointense on T1WI and hyperintense on

T2WI. Enhancement is usually homogeneous, although larger tumors may show heterogeneous attenuation or heterogeneous signal intensity due to cystic degeneration or hemorrhage. Atrophy and fatty infiltration of the mastication muscles are commonly seen in cases of chronic denervation.⁶ Other imaging findings include widening of the neural foramina and/or canals and excessive enhancement of the nerve.³ MRI is the investigation of choice in the diagnosis of schwannoma and the identification of nerve of origin.⁸ CT is better than MR in detecting subtle erosions of the cortex of the mandible and provides excellent detection and characterisation of the tumor matrix mineralisation.

The diagnosis of schwannoma is suggested by clinical features and supported by investigations. Most of the time, the diagnosis can only be confirmed on the histological study of the surgical specimen. Tissue biopsy aids in histopathological confirmation of schwannoma.

Schwannomas are generally managed by surgical excision. Schwannomas extending along the masticator space from the foramen ovale up to the parapharyngeal space requires the need for a simultaneous approach to the skull base for the intracranial portion of the mass, and to the parapharyngeal space and masticator space for its extracranial extension.¹² A modified preauricular and trans-mandibular approach was selected for complete en bloc resection of the tumor and preservation of the facial nerve. There have been various reports regarding approaches to tumors in the infratemporal fossa.¹³ Antonio kolokythas et al proposed that when the tumor located in the parapharyngeal space greatest diameter exceeds 4 cm mandibular access osteotomy should be performed for better access and complete resection of tumor.⁸ In the case report discussed here the tumor's greatest diameter exceeded 6.5 cm so mandibulotomy was performed to resect the tumor. However, this surgical approach allows complete exposure of the infratemporal fossa, where access is not blocked by the facial nerve. The lateral approach to the infratemporal fossa allows wide exposure of the surgical field, shorter depth of work, and adequate control of bleeding, however it was not required in our case as complete tumor excision was feasible with the preauricular trans-mandibular approach itself. Sacrificing the mandibular ramus above the angle of the mandibular condyle allows a wide approach to the glenoid fossa and lower portion of the infratemporal fossa, however in our case since most of the tumor bulk resided in the parapharyngeal space an access mandibular osteotomy was sufficient to excise the tumor.

CONCLUSION

This case report includes a schwannoma arising from the trigeminal nerve presenting as a preauricular swelling

which could have been easily mistaken for a parotid tumor. Preoperative cytological and radiological investigations were of paramount importance in diagnosis. A multidisciplinary approach can aid in resection of such large tumors such as in our case scenario. The combined preauricular trans-mandibular approach can be used for such tumors and provides adequate access to the masticator space once coupled with mandibular osteotomy.

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Ethical approval: Not required

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