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Case report

Giant trigeminal schwannoma with parapharyngeal extension: Report of a case

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ABSTRACT

The authors present their experience in the treatment of a giant trigeminal schwannoma with wide extension in the parapharyngeal space using a combination of the orbito-zygomatic and the transcervical–transmandibular approaches. The clinical and radiological findings, advantages of surgical approach and clinical outcome will be discussed.

1. Introduction

Trigeminal schwannomas are rare tumours, accounting for 0.07–0.36% of all intracranial tumours and 8% of intracranial schwannomas. They may arise from the trigeminal nerve root, Gasserian ganglion, or one of the three peripheral branches of the trigeminal nerve (Samii et al., 1996).

The diagnosis is usually delayed until there is extension into the infratemporal fossa and parapharyngeal space. As the tumour grows into these spaces, the symptoms are usually vague until the mass becomes large enough to compress adjacent structures, leading to dysphagia, dysarthria, trismus, or pain (Martini et al., 1994). Management of these large tumours requires special skills, because of the need for a simultaneous approach to the skull base, for the intracranial portion of the mass, and to the parapharyngeal space, for its extracranial extension (Sandalcioglu et al., 2005). Thus, their management is challenging and a multidisciplinary approach involving both a neurosurgeon and a head-and-neck surgeon should be considered.

Several surgical approaches have been described (Lello et al., 1997) for the resection of trigeminal schwannomas: the most popular are the skull base (Tzortzidis et al., 1996), orbito-zygomatic, transmaxillary, facial translocation, transpterygoid, infratemporal, and transcervical approaches, the latter with or without a mandibulotomy (Yoshida and Kawase, 1999). However, when a giant trigeminal schwannoma extends into the parapharyngeal space, as in the case presented here, we suggest a combination of the orbito-zygomatic approach, for the intracranial portion and the upper portion in the parapharyngeal space, and the transcervical–transmandibular approach, for the lower portion in the parapharyngeal space (Guinto et al., 1999).

2. Case report

A 28-year-old woman with a non-contributory medical history was referred to our department with progressive swelling of the left face with hypoesthesia of the areas served by the second and third trigeminal nerve branches. Magnetic resonance imaging (MRI) (Fig. 1) and computed tomography (CT) showed a lesion centred on the left foramen ovale, extending cranially to Meckel's cave, the cavernous sinus, and the middle cranial fossa. Inferiorly, the tumour extended into the pre- and retro-styloid compartments of the parapharyngeal space, to the masticatory space, and to the infratemporal fossa, leading to remodeling of the zygomatic arch, lateral wall of the maxillary sinus, and mandibular ramus, with enlargement of the alveolar nerve canal. The tumour was close to the cervical portion of the internal carotid artery, which was displaced and compressed, and surrounded by the tumour for about 180°. Based on the radiological appearance of the lesion, the diagnosis of trigeminal nerve schwannoma was made and the patient was scheduled for surgical tumour resection.

Through a left cervicotomy, the posterior belly of the digastric muscle, the stylomandibular and stylohyoid ligaments, and the stylohyoid, stylopharyngeus, and styloglossus muscles were transected, providing access to the inferior portion of the parapharyngeal space tumour. To increase the surgical exposure, after

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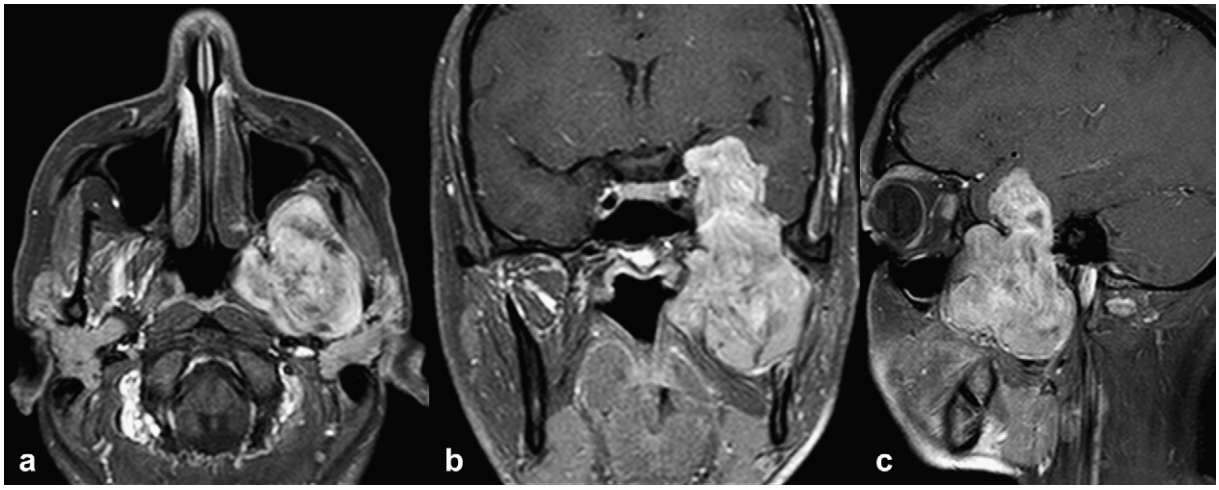

Fig. 1. Pre-operative T2-weighted MRI in axial (a), coronal (b) and sagittal (c) planes showing tumour extension and parapharyngeal space involvement.

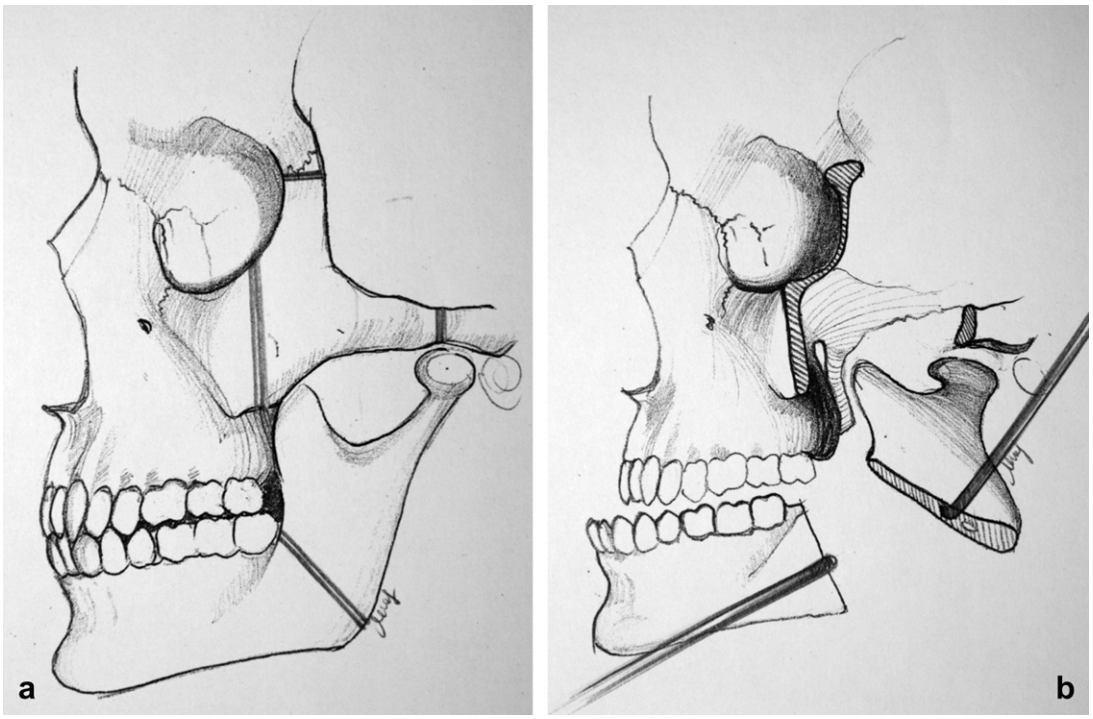

Fig. 2. Drawing illustrating osteotomies of the combined orbito-zygomatic and transmandibular approach (a) and field exposure after temporary resection of the zygoma and distraction of the mandible (b).

detaching the masseter muscle insertion and pre-plating, a single mandibulotomy was performed at the mandibular angle. No care was taken to preserve the alveolar nerve because of the foreseen resection of the third trigeminal branch involved by the tumour. Through a left coronal access, the temporalis muscle was dissected from the temporal fossa and left-pedicled to the coronoid process. The zygoma and zygomatic arch were removed temporarily (orbito-zygomatic approach) to approach the cranial base and infratemporal fossa. Through the combination of the transcervical/transmandibular and orbito-zygomatic accesses, the extracranial portion of the tumour was resected completely at the level of the middle cranial fossa floor (Fig. 2).

Through the orbito-zygomatic approach, the temporal bone was drilled to the level of the middle crania fossa floor. Under optical microscope magnification, the fronto-temporal dura mater was opened and retracted downwards. Through an intradural sub-temporal approach, the tumour capsule was opened and the mass was removed using an ultrasound suction system (CUSA).

A previously harvested temporalis muscle flap was split and two-thirds were used to reconstruct the osteo-dural defect, while the remaining one-third was repositioned to reduce the defect at the donor site. The zygoma was repositioned and fixed with miniplates and screws. The mandibular osteotomy was reduced and fixed with the two previously modeled miniplates. Finally, the masseter muscle was fixed to the mandibular angle through holes in the mandibular masseter insertion.

The spinal drain was removed 2 days postoperatively. After 12 days of uneventful hospitalization, the patient was discharged without complications.