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Case Report

A giant trigeminal schwannoma of the infratemporal fossa removed by transmandibular approach and coronoidectomy ☆

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ABSTRACT

The whole spectrum of infratemporal fossa (IF) tumors comprises both intra- and extracranial tumors. Schwannomas are benign nerve tumors arising from the Schwann cells. Approximately 25%-45% of schwannomas occur in the head and neck region. The lesions commonly arise from the roots of cranial and cervical nerves in the parapharyngeal space, with the majority originating from the vagus nerve. Trigeminal schwannomas account for about 0.2% of all intracranial tumors, and 0.8% and 8% of intracranial schwannomas. Trigeminal schwannomas are commonly located in the intracranium. Exclusive extracranial trigeminal schwannoma are exceptional lesions that may also involve the maxillary sinus, the orbit, and the parapharyngeal space. Schwannomas of the head and neck can originate from any section of the fifth cranial nerve, from the root to the distal extracranial branches, but the majority develops at the Gasserian ganglion, usually growing in the middle cranium. Schwannomas arising primarily within the IF, without intracranial extension, are extremely rare. Many approaches were described for extracranial trigeminal schwannomas originating from the skull base, such as transmaxillary approach, or Le Fort I type I osteotomy, or facial translocation approach, or infratemporal approach, or transmandibular transcervical approaches. We present a case of voluminous extracranial schwannoma, arising from the extradural divisions of the trigeminal nerve, extending in the IF and parapharyngeal space, treated via a transmandibular approach. The literature regarding extracranial schwannomas of the IF and parapharyngeal space, and their approaches are reviewed.

1. Introduction

The whole spectrum of infratemporal fossa (IF) tumors comprises both intra- and extracranial tumors.

Schwannomas are benign nerve tumors arising from the Schwann cells. Approximately 25%-45% of schwannomas occur in the head and neck region. The lesions commonly arise from the roots of cranial and cervical nerves in the parapharyngeal space, with the majority originating from the vagus nerve [1,2].

Schwannoma is a benign, slow growing encapsulated tumor that originates from the Schwann cells sheathing peripheral motor, sensory, and cranial nerves, except first and second cranial nerve.

First described as a separate entity by Verocay in 1910 [3], they have been reported in almost every part of the body.

Trigeminal schwannomas account for about 0.2% of all intracranial tumors, and 0.8% and 8% of intracranial schwannomas [4,5]. Trigeminal schwannomas are commonly located in the intracranium [6]. Exclusive extracranial trigeminal schwannoma are exceptional lesions that may also involve the maxillary sinus, the orbit, the parapharyngeal space [7].

Schwannomas of the head and neck can originate from any section of the fifth cranial nerve, from the root to the distal extracranial branches, but the majority develops at the Gasserian ganglion, usually growing in the middle cranium.

Schwannomas arising primarily within the IF without intracranial extension are extremely rare.

Many approaches were described for extracranial trigeminal schwannomas originating from the skull base, such as transmaxillary approach, or Le Fort I type I osteotomy, or facial translocation approach, or infratemporal approach, or transmandibular transcervical approaches.

We present a case of voluminous extracranial schwannoma, arising from the extradural divisions of the trigeminal nerve,

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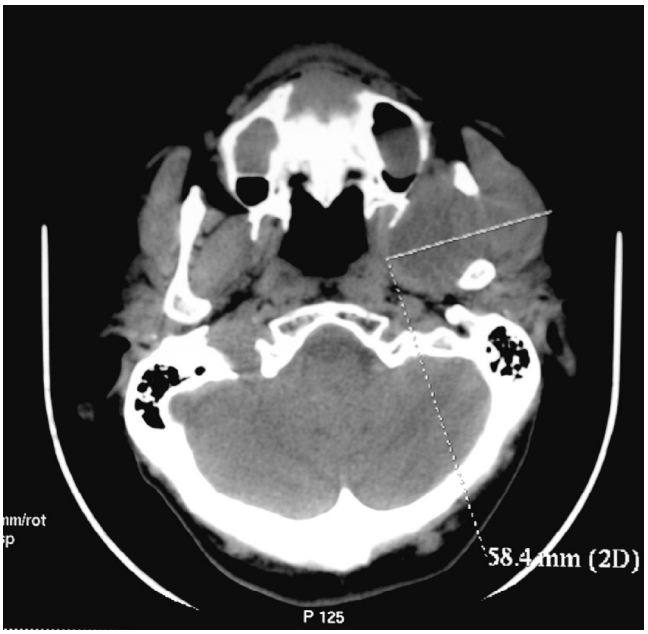

Figure 1. An axial postcontrast computed tomography scan shows that the tumor has grown in the left infratemporal fossa, extending laterally through the mandibular notch.

extending in the IF and parapharyngeal space, treated via a transmandibular approach and coronoidectomy.

2. Presentation of case

A 63-year-old woman presented with a 6 months' history of swelling in the left lateral face.

On examination, a mass was localized in the left preauricular region. There was no evidence of uvular deviation or palpable mass in the retromandibular area. There was hypoesthesia in the distribution of the mandibular division of the trigeminal nerve. Full-mouth opening was 3.5 cm and moderate tenderness developed on palpation of the left temporomandibular joint area.

A complete physical examination did not reveal any cutaneous manifestations of neurofibromatosis.

A cranial computed tomography scan demonstrated a discrete, well-circumscribed, homogeneously enhancing mass of the IF extending inferiorly in the parapharyngeal space and, laterally, through the mandibular notch (Figure 1).

An open biopsy preoperatively diagnosed the lesion as a benign schwannoma.

The lesion was planned to be removed via a transmandibular approach in consideration of its location and the patient's symptoms. This approach can be considered a modified Yumoto's [8] approach.

The surgical approach started with a labiotomy. The skin incision continued down to the chin and curved downward across the neck and up in front of the ear. A modified Blair's incision combined with horizontal incision in the skin crease was made two fingers breadth below the mandible (Figure 2). A subplatysmal flap was elevated. The submandibular gland was retracted, and the angle and parts of the mandible were exposed. A mucosal incision was made proceeding posteriorly along the lower gingivolabial sulcus. The incision crossed the ascending ramus of the mandible and ended close to the pterygoid hamulus. Soft tissues including skin, the parotid gland, and the masseter muscle were elevated from the mandible

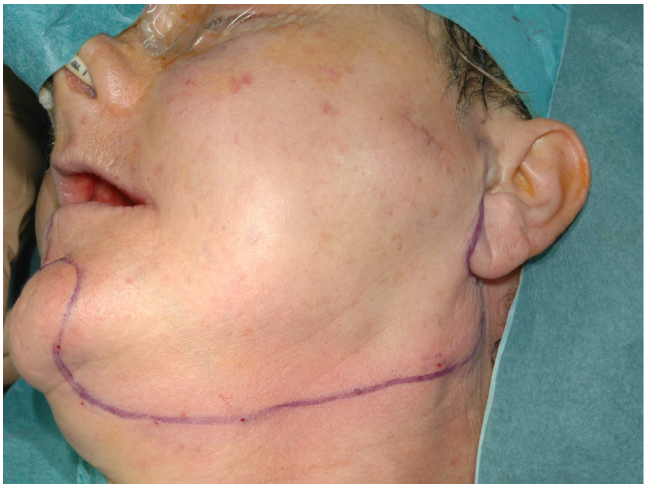

Figure 2. Intraoperative photograph showing the surgical approach.

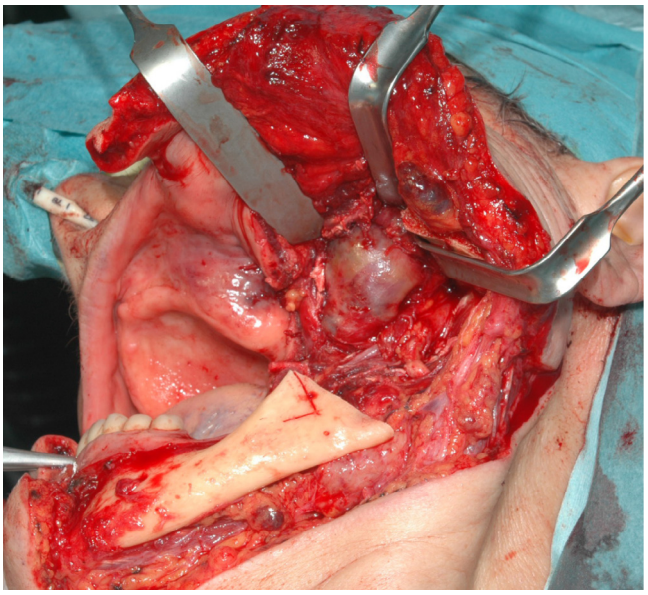

Figure 3. Intraopertative photograph of the tumor mass after the cut of the mandible at the level of the angle. The ascending ramus is retracted upward.

and retracted upward. This step preserved the facial nerve. After the coronoidectomy, the mandible was cut at the level of the angle. The ascending ramus was then retracted upward. Resection of the coronoid process facilitated mobility of the ascending ramus and increased the surgical exposure (Figure 3). A well-defined bilobate mass was identified. The origin site of the lesion was identified to be the mandibular branch of the trigeminal nerve. The mass was well encapsulated end measured 6.5×3 cm after removal (Figure 4).

The retracted ascending ramus assumed its original position and was fixed by two miniplates and screws (prepared with pre-plating techniques before mandibular osteotomy). Occlusion was managed with temporary intermaxillary fixation with four intermaxillary fixation screws and wire, and with the pre-plating of the two plates before the osteotomy.

The histopathology was consistent with a benign schwannoma. The histologic examination revealed a spindle-celled proliferation with nuclear palisading and Verocay-body formation.