Endoscopic Approach to the Trigeminal Schwannoma of the Pterygopalatine Fossa

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Abstract

Schwannomas develop from Schwann cells surrounding neural tissue and compose 8% of all intracranial tumors. Trigeminal schwannoma is rare, but it occurs secondly after vestibular schwannoma. These tumors may originate from any part, between the root and the distal extracranial branches of the trigeminal nerve. Therefore, different signs and symptoms occur depending on the actual size and site of origin of the tumor. In this article, it is aimed to discuss trigeminal schwannoma located in the pterygopalatine fossa in context of diagnosis and treatment methods.

Keywords: Trigeminal schwannoma, endoscopic surgery, pterygopalatine fossa

INTRODUCTION

Schwannomas are tumors originating from the Schwann cells surrounding the nerve structure in most of the peripheral, cranial, and autonomic nerves. Schwannomas developing in the head and neck region constitute 25%-35% of the reported schwannoma cases. These tumors are very rarely seen in the nose and paranasal sinuses (<4% of all schwannomas) (1). Olfactory and optic nerves do not cause schwannomas because they are deprived of the Schwann cells (2, 3). Trigeminal schwannoma is uncommon, but the second most common tumor after vestibular schwannoma. Schwann cell tumors arise from any part of the trigeminal nerve and can develop with various symptoms and signs. These tumors are generally benign and they can be treated with radical resection (1). Besides that, because of the complex developmental patterns of trigeminal schwannomas, techniques based on extensive knowledge of skull base anatomy are required for the radical excision of tumor. In this study, endoscopic transnasal surgical treatment for a case of trigeminal schwannoma which localizated in the pterygopalatine fossa was evaluated.

CASE PRESENTATION

A 37-year-old female patient was admitted to our clinic with complaint of severe pain in the right temporal region, which occurred intermittently for a while but then increased. No pathology was detected in her physical examination and routine analyses. The patient was conscious and cooperative. No cranial nervous system involvement was observed except hyposthesia in the 1st and 2nd branches of the trigeminal nerve on the right side. The results of audiological tests were normal. In computed tomography (CT) of the paranasal sinus and contrast-enhanced cranial and orbital magnetic resonance (MR) examination, an approximately 45 × 35 × 40 mm mass lesion located in the neighborhood of the right maxillary posterior sinus, eroding the posterior of the inferior wall of the orbita and ala major part of the sphenoid bone, and protruding to the sphenoid sinus was observed. The mass was found to be in the neighborhood of the anterior part of the Meckel Cave and ophthalmic artery and in contact with the dura, but no sign of invasion was observed (Figure 1 and 2). The patient decided to undergo an operation. The tumor was excised with its capsule in the right transnasal endoscopic skull base intervention. It was observed that the tumor filled the choana, extended toward the posterior region of the orbita in the lateral, was at 1 cm distance from the skull base in the superior, and leaned toward the anterior and lateral wall of the sphenoid sinus in the posteromedial (Figure 3). The mass was excised and sent for pathological examination. The pathological result was reported to be consistent with schwannoma with morpholocial findings remaining in the forefront. In the postoperative 3rd month, regression was observed in her complaints and no residual recurrence was found in the imaging (Figure 4 and 5). Patient's oral and written informed consent was taken.

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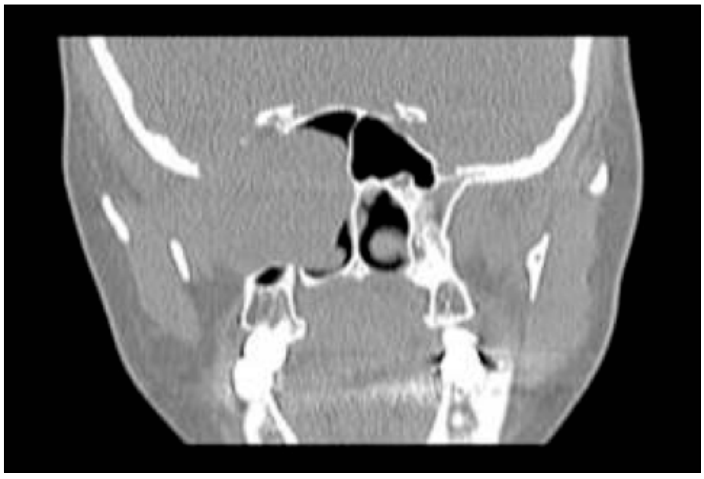

Figure 1. Preoperative computed tomography coronal section

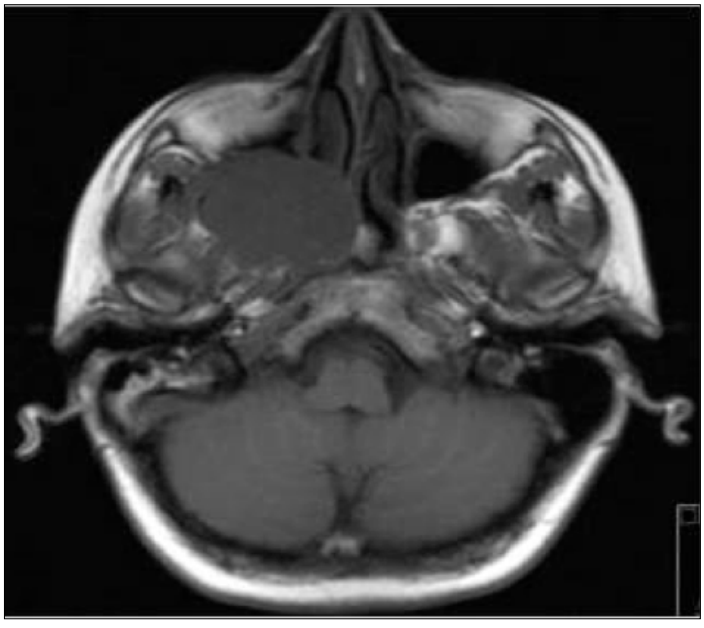

Figure 2. Preoperative magnetic resonance axial section

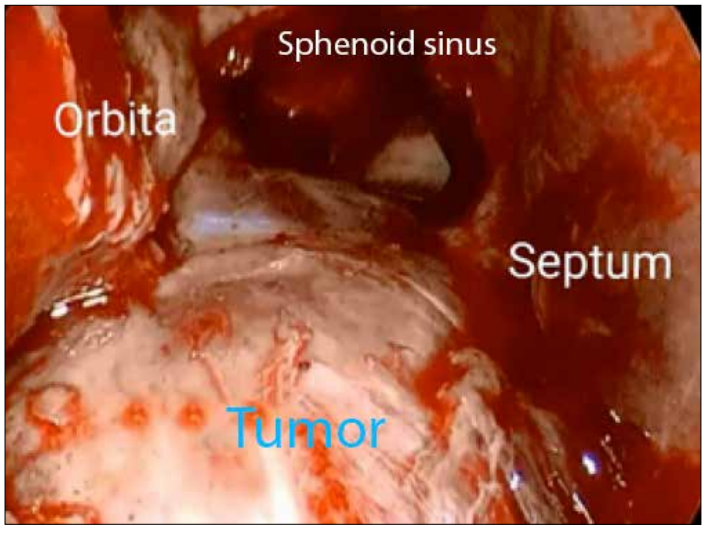

Figure 3. Peroperative endoscopic view

DISCUSSION

Schwannomas are the tumors that are generally encapsulated and less locally aggressive with lower potential of malignant degeneration (2, 4, 5). Histologically, they are very similar to malignant tumors, such as leiomyosarcoma or malignant peripheral nerve sheath tumors; therefore, a complete histopathological and/or immunohistochemical examination should be performed for an accurate differential diagnosis. Trigeminal schwannomas were firstly defined in 1849 (6). These are rarely encountered tumors and constitute 0.8%-8% of all schwannomas, 8% of all intracranial tumors, and 0.07%-0.28% of all brain tumors (7, 8). They are mostly seen in the age of 30-40 years among women. Malignant cases have also been reported (9). The treatment of trigeminal schwannomas presenting with various symptoms because of different localization and origin can differ. They can also arise from the root and peripheral branches of the

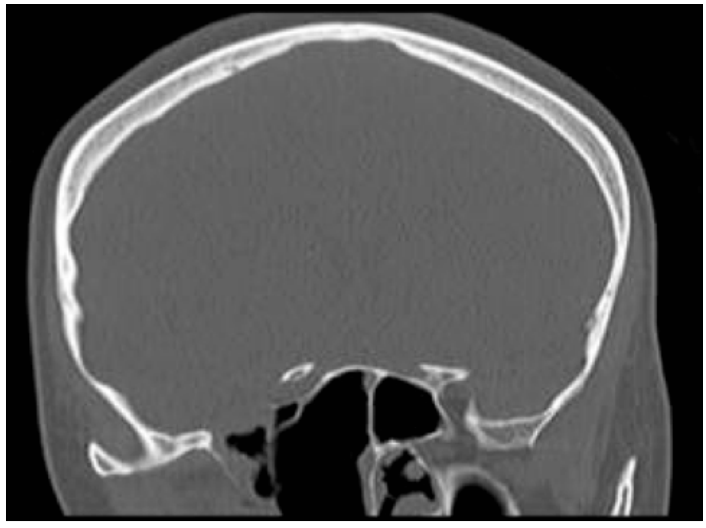

Figure 4. Postoperative computed tomography coronal section

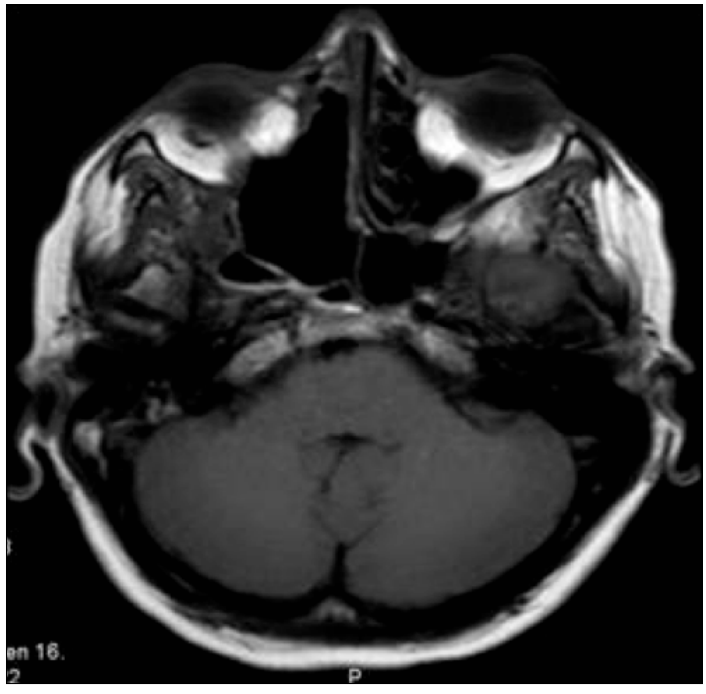

Figure 5. Postoperative magnetic resonance axial section

nerve, particularly from the gasserian ganglion (2, 5, 6). Depending on the tumor's localization, size, and compression on the neighbor nerves, various motor and sensory symptoms, such as muscle weakness, pain, numbness, paresthesia, and sensory deprivation can occur (1). Surgical approach depends on the anatomical localization of trigeminal schwannoma. Therefore, a good radiological examination in preoperative period is necessary for planning the management of surgical approach (10). The ways of approach to tumor have increased owing to developments in anatomical and surgical techniques for skull base surgery. Frontotemporal, orbitozygomatic, inferiotemporal, subtemporal-transtenterial, presigmoid, and retrosigmoid approaches are among them (11). Because of its resistance to radiotherapy, surgery is accepted as the best treatment for both benign and malignant schwannomas. Compared to conventional approaches, endoscopic endonasal approach is recommended for its lower morbidity, absence of external incision, and shorter hospitalization period (11).

CONCLUSION

In our case, the tumor was localized in the pterygopalatine fossa and extended towards the infratemporal fossa. The tumor was close to the ophthalmic artery and dura without invasion, therefore endoscopic endonasal approach was planned. Because this is a rare tumor with respect to its localization, we suggest that patients with atypical facial pain and hyposthesia should be examined through imaging techniques in early diagnostic period and we would like to emphasize the success of endoscopic surgical treatment.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

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