Petrous apex meningioma

Diagnosis



Differential diagnosis

see Petrous apex lesion

Approach

The literature describes a variety of surgical approaches to deal with meningiomas that involve the apex of the petrous bone and lie predominantly in the posterior fossa, e.g. the transpetrosal (translabyrinthine and transcochlear), the combined supra- and infratentorial, the subtemporal with or without pyramid resection, the suboccipital and the orbitozygomatic approaches.

A study presents an alternative surgical approach, namely a modification of the occipital craniotomy with or without tentorial division. This approach was used for the removal of three petrous bone apex meningiomas which were medium to large in size and located predominantly in the posterior fossa with extension into the middle fossa. Complete tumour excision was achieved with no morbidity and no mortality $^{1)}$.

Case series

Hegazy et al. from the Cairo University, Egypt and Department of Neurosurgery, Montefiore Medical Center, Albert Einstein College of Medicine, Bronx, New York, USA, reported a retrospective study of 17 patients with a small (<3 cm) petrous apex meningioma. The included patients were refractory to medical treatment for trigeminal neuralgia and were deemed as surgical candidates. Postoperatively, the patients were assessed for pain relief according to the Barrow Neurological Institute (BNI) scale. A P value of less than 0.05 was considered significant. Magnetic resonance imaging was also performed after 6 weeks to assess the radicality of resection.

In a median follow-up of approximately 2 years, the study showed that 14 of the 17 (82.4%) patients had complete pain relief, with very low morbidity and no mortality, and 100% tumor control. According to the Barrow Neurological Institute Pain Scale for the assessment of postoperative pain relief, 52.9, 23.5, 5.9, 11.8, and 5.9% of patients had grades I, II, IIIa, IIIb, and IV in terms of their pain relief, respectively.

In this population of patients, surgery proved to be successful in providing symptomatic relief, with low morbidity and no mortality, and was comparable with other studies involving the minimally invasive modalities. However, these results warrant further follow-up, with recruitment of more patients, to demonstrate whether or not, surgery should be the primary choice of treatment in this subgroup of patients².

Case report

2014

A 50-year-old female with a 1-year history of right-side facial numbness, as well as an electric shocklike sensation on the right-side of the face and tongue. She was previously diagnosed with vertigo and trigeminal neuralgia. MRI was obtained showing a large right cerebellopontine angle mass. A retrosigmoid approach was performed and total removal was achieved after dissection of tumor from brainstem and cranial nerves IV, V, VI, VII and VIII. Pathology confirmed the diagnosis of a meningioma (WHO Grade I). The patient was discharged neurologically intact on the third postoperative day free of complications.

The video can be found here: http://youtu.be/-tR0FtMiUDg

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2011

Shimanskiĭ et al. presents an example of endoscopically assisted neurosurgical removal of petrous apex meningioma associated with trigeminal neuralgia. Endoscopy was used during the operation for control of completeness of tumor removal and for identification of offending vessel and control of

position of protector. Total resection of the tumor was achieved, complete regression of trigeminal pain was observed in early postoperative period ³⁾.

2001

A 50-year-old woman who experienced medically refractory trigeminal pain. She was diagnosed with a meningioma around the petrous apex and treated by fractionated stereotactic radiation. After a short period of alleviation accompanied by hypesthesia, the pain returned in a previously unknown and violent fashion.

Complete tumor removal through a retrosigmoid intradural suprameatal approach resulted in immediate and permanent pain cessation.

Radiotherapy should be withheld for benign and accessible tumors of the cranial base until the option of radical microsurgical treatment has been explored $^{4)}$

1999

A 64-year-old female presented with right trigeminal neuralgia. Computed tomography and magnetic resonance (MR) imaging demonstrated a tumor attached to the right petrous apex. MR imaging also revealed that the trigeminal nerve was compressed and distorted by the tumor. Tumor removal and microvascular decompression (MVD) were performed via the anterior petrosal approach. The trigeminal nerve was distorted by the tumor and the superior cerebellar artery compressed the medial part of the root entry zone of the trigeminal nerve. The surgery resulted in complete relief of the trigeminal neuralgia. Posterior fossa tumors causing ipsilateral trigeminal neuralgia are not rare, and are often removed via the suboccipital retromastoid approach, as MVD for trigeminal neuralgia is usually performed through the retromastoid approach. The advantages of the anterior petrosal approach are shorter access to the lesion and direct exposure without interference from the cranial nerves, and that bleeding from the tumors is easily controlled as the feeding arteries can be managed in the early stage of the surgery. We conclude that the anterior petrosal approach is safe and advantageous for the removal of petrous apex tumor associated with trigeminal neuralgia ⁵⁾.

1979

A patient harboring a malignant meningioma in her petrous apex is presented. A middle fossa craniectomy, coupled with posterior displacement of the facial nerve, allowed access to the entire temporal bone from above. The patient received postoperative irradiation ⁶.

Videos

Retrosigmoid approach for resection of petrous apex meningioma

<html><iframe width="560" height="315" src="https://www.youtube.com/embed/-tR0FtMiUDg" frameborder="0" allowfullscreen></iframe></html>

Petrous Apex Meningioma resection

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1)

3)

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