Clival Meningioma Removal through a Suboccipital Retrosigmoid Approach: Operative Video and Technical Nuances

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Abstract

Background Clival meningiomas are challenging lesions that need to be managed according to the displacement of the adjacent structures. Lateral skull base approaches are needed to achieve their radical removal; however, they are associated with significant morbidity, especially when the tumor involves the basilar artery, its perforators, brainstem, and lower cranial nerves.

Design This is a case of a 79-year-old female patient, diagnosed with a large lower clival meningioma after suffering from headaches. It was offered a conservative treatment but on serial MRI, an increase in the meningioma's size was observed, so it was decided to remove the meningioma using a left suboccipital retrosigmoid approach.

Settings On a left three-quarter prone position, with facial nerve, auditory brainstem response, lower cranial nerves, and motor-evoked potentials and somatosensory-evoked potentials neurophysiologic monitoring, a right suboccipital retrosigmoid craniotomy with opening of the foramen magnum was performed, giving enough lateral visualization of the tumor. Broad base tumor pushing backward and aside the vertebral and basilar arteries, cranial nerves (7th–12th), and the brainstem was exposed and removed.

Results Near total resection of the meningioma was achieved, leaving a microscopic residual in the entry points of the low cranial nerves without complications. There was no neurological deficit after the surgery. Postoperative MRI revealed no signs of residual tumor.

Conclusion: In this case, the regular retrosigmoid approach, extended into the foramen magnum was enough for the removal of this pure clival meningioma.

The link to the video can be found at: <https://youtu.be/3d6Uj4gjmDU>.

Keywords

- clival meningioma
- retrosigmoid approach
- foramen magnum
- operative video
- low cranial nerves

Conflict of Interest

None declared.

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Fig. 1 Pre- and Postoperative magnetic resonance imaging (MRI). (A) Preoperative Axial T1-weighted gadolinium-enhanced MRI showing a large clival meningioma involving the vertebrobasilar complex. (B) postoperative axial T1-weighted gadolinium-enhanced MRI showing no signs of tumor residual.

Fig. 2 Intraoperative imaging. (A) Intraoperative view showing the view giving by the retrosigmoid approach. (B) View showing the tumor involving the low cranial nerve.