

Foramen Magnum Meningioma: Microsurgical Endoscopic-Controlled Resection via a Lateral Suboccipital Retrocondylar Approach with Preservation of Posterior Arch of Atlas Integrity

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J Neurol Surg B 2019;80(suppl S4):S352–S354.

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Abstract

Objective Surgical treatment of foramen magnum (FM) meningiomas is challenging due to proximity of the tumor to critical neurovascular structures, namely, the lower brainstem/upper cervical cord, vertebral artery, PICA, and lower cranial nerves. Controversies in microsurgical resection of meningiomas in this location include the necessity for condyle drilling and the need for vertebral artery mobilization. However, a laminectomy or hemilaminectomy of the C1 posterior arch is usually routinely performed. We herein present microsurgical, endoscopic-controlled resection of a FM meningioma via a posterolateral retrocondylar suboccipital craniotomy with preservation of the integrity of the posterior arch of the atlas.

Setting Our patient, a 57-year-old patient, suffered from right-sided hemiparesis due to a right-sided ventrolateral FM meningioma compromising the medulla oblongata and upper cervical cord. The tumor at the craniocervical junction was resected through a posterolateral suboccipital retrocondylar craniotomy.

Results Radical resection of the FM meningioma was accomplished via a lateral suboccipital retrocondylar craniotomy with preservation of posterior arch of atlas integrity. The postoperative course was uneventful with full preservation of neurological function. Preoperative hemiparesis subsided completely after surgery.

Conclusion Anterior-laterally located FM meningiomas can be safely and completely resected via a suboccipital retrocondylar craniotomy. A laminectomy or hemilaminectomy of the posterior arch of C1 is not routinely required for complete and safe resection of these tumors at the craniocervical junction. Neuroendoscopy is beneficial for control of complete tumor resection.

The link to the video can be found at: <https://youtu.be/DBk6qoJ6OzQ>.

Keywords

- ▶ meningioma
- ▶ skull base
- ▶ microsurgery
- ▶ foramen magnum
- ▶ neuroendoscopy



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received
March 24, 2019
accepted
August 25, 2019
published online
October 22, 2019

DOI <https://doi.org/10.1055/s-0039-1698822>.
ISSN 2193-6331.

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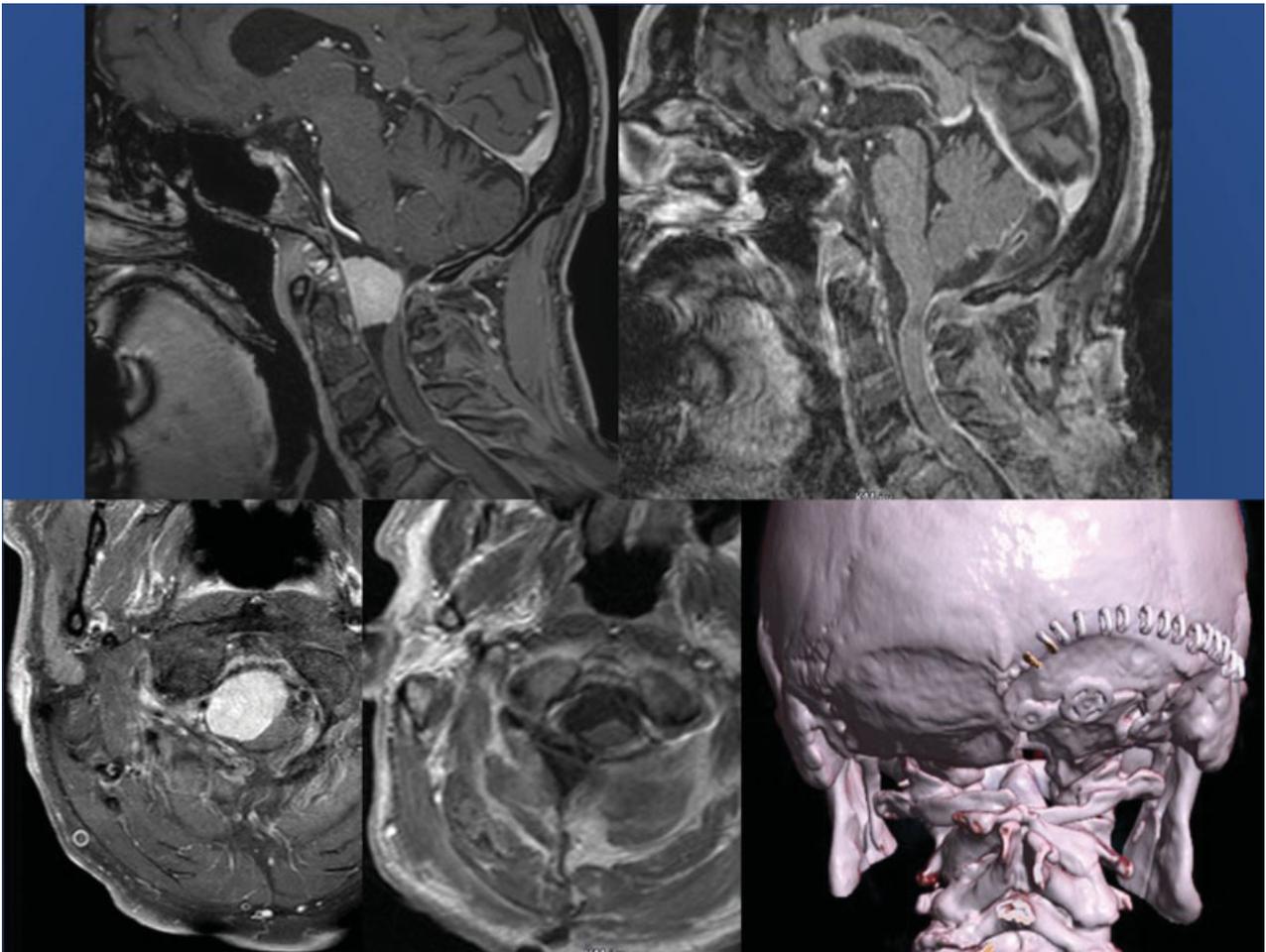


Fig. 1 Pre- and postoperative MRIs with contrast enhancement showing complete removal of foramen magnum meningioma. Postoperative 3D CT bone window displays preservation of posterior atlantal arch integrity. 3D, three-dimensional; CT, computed tomography; MRI, magnetic resonance imaging.

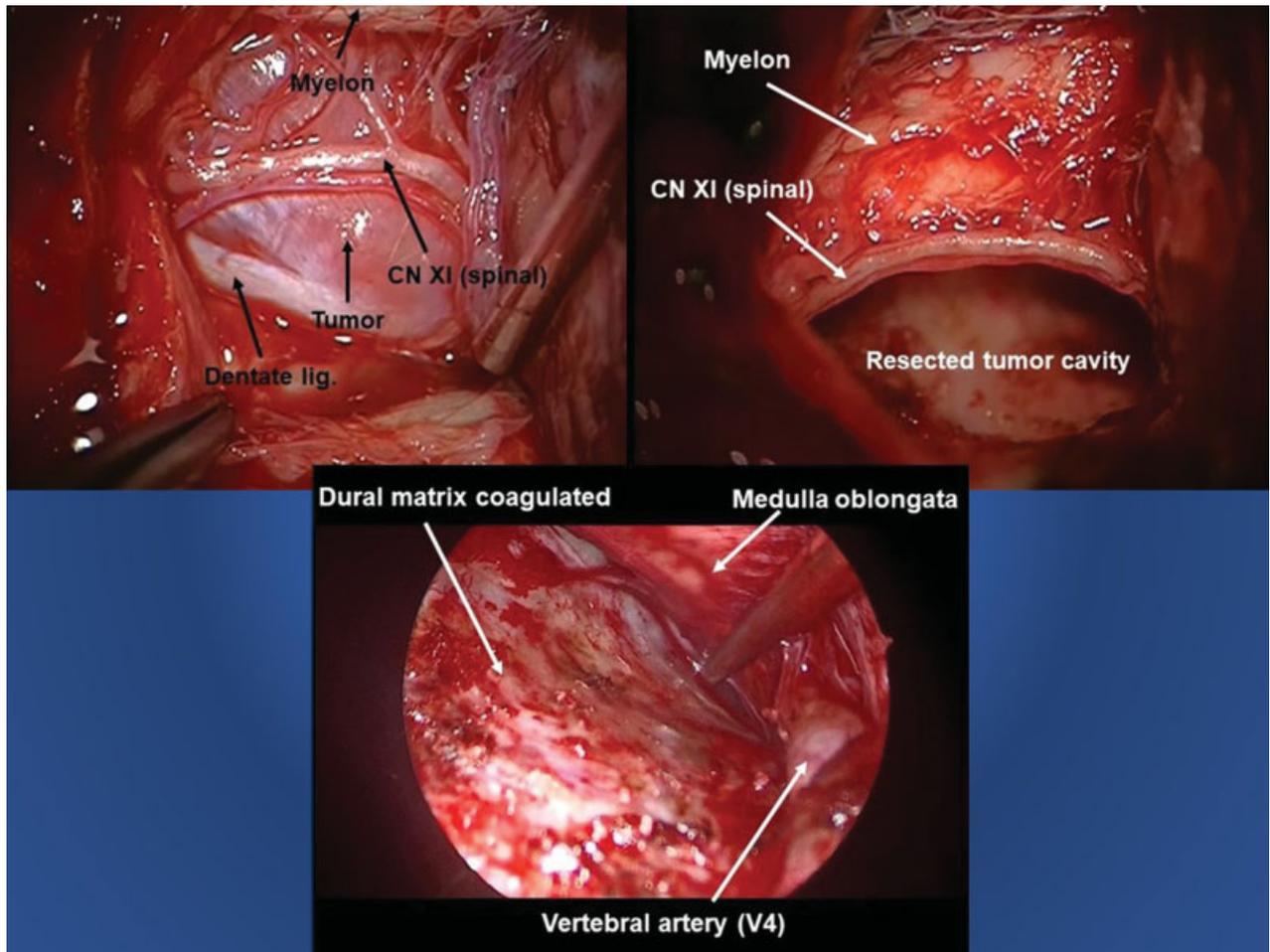


Fig. 2 Intraoperative view before and after complete tumor removal. Endoscopic control demonstrating vertebral artery. CN, cranial nerve.

Publication Comments

The authors' video is an excellent demonstration of the resection of a foramen magnum meningioma that is primarily located in the upper cervical spine canal. They have shown that the tumor can be safely resected with the removal of just a small portions the superior aspect of the lamina of C1 on the operated side, otherwise largely leaving the ring of C1 intact.

This is an interesting technique that I will keep in mind when approaching these tumors in the future.

The authors have used the straight prone position rather than the lateral position, and an inverted "J" incision rather than a curvilinear incision as I might use, but there are a number of approaches to such a lesion and the author's technique as demonstrated in the video is excellent.

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Conflict of Interest
None declared.