



# C1 Hemilaminectomy for Resection of Foramen Magnum Meningioma: 2-Dimensional Operative Video

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## Abstract

We present a case of a sizeable foramen magnum meningioma that was resected through a C1 hemilaminectomy in prone (concorde) position. The patient is a 51-year-old woman with a 3-month history of progressive paresthesia of the upper and lower extremities, followed by gait disturbance, and hand apraxia. There was no complaint of nuchal pain.

On magnetic resonance imaging (MRI) a briskly enhancing extra-axial, intradural craniospinal lesion, extending from the basion of the lower clivus, over the tectorial membrane to the middle of the axis' body was discovered. There was significant transposition and compression of the medulla and corresponding focal hyperintensity on T2-weighted imaging.

On physical examination, the patient was ambulatory independently, notwithstanding a pronounced spinal ataxia. There were deficits in sensation and proprioception, as well as urinary retention, but preserved function of the lower cranial nerves.

In view of the profound transposition of the medulla, utilization of the corridor created by the tumor seemed feasible and we felt that a limited C1 hemilaminectomy would provide sufficient microsurgical access thus obviating a more extensive and invasive approach to the craniocervical junction.

A gross-total resection was achieved; histopathology confirmed a World Health Organization (WHO) grade I angiomatous meningioma with a low-proliferation index. The patient was discharged home 3 days after surgery and her spinal ataxia resolved completely within 3 months of out-patient rehabilitation. At 3-year follow-up, there was no indication of residual or recurrence.

The link to the video can be found at: <https://youtu.be/WyShbfr-xi0>.

## Keywords

- ▶ foramen magnum
- ▶ C1 hemilaminectomy
- ▶ craniocervical junction
- ▶ meningioma
- ▶ concorde position
- ▶ operative video



## Conflict of Interest

None declared.

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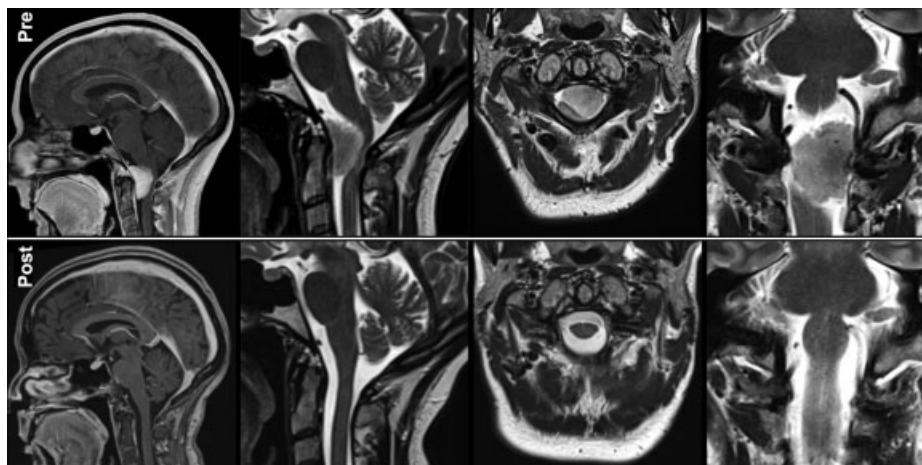
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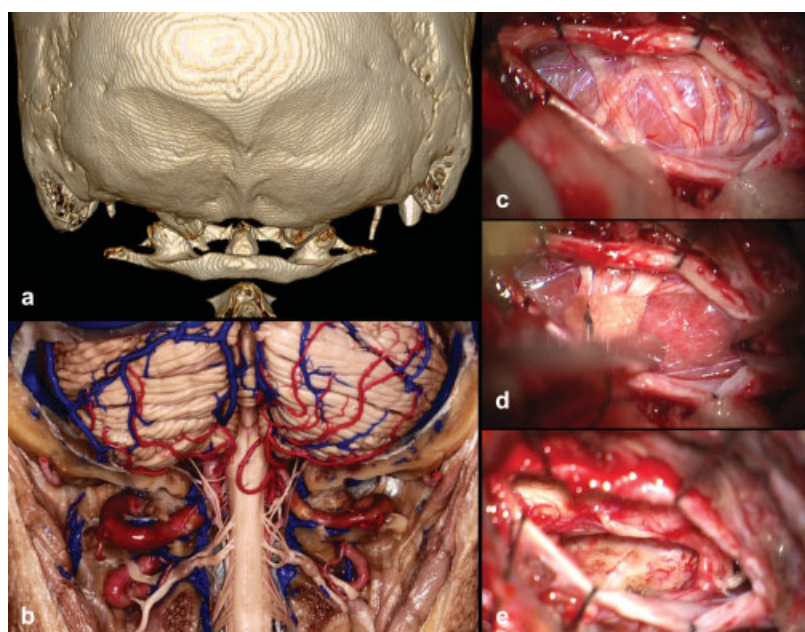
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**Fig. 1** Pre- and postoperative MRI studies of this intradural craniocervical meningioma that extends from the basion of the lower clivus over the tectorial membrane to the middle of the axis' body. It originates anterolaterally, occupies most of the foramen magnum's space, and profoundly displaces the medulla posteriorly and contralaterally. MRI, magnetic resonance imaging.



**Fig. 2** (A) CT 3D reconstruction (actual patient) of the craniocervical junction, and (B) anatomical dissection (fixed, silicone injected human cadaver) of the correlating intradural neurovascular structures. Operative still images of a left-sided C1 hemilaminectomy: (C) exposure of the anterolateral meningioma, rootlets of the spinal accessory nerve, C1 and C2 are transposed posterolaterally, (D) dissection of the meningioma's capsule via an inferomedial surgical corridor, (E) after complete microsurgical excision and bipolar coagulation of the dural attachment sites on clivus, tectorial membrane, and posterior longitudinal ligament. 3D, three-dimensional; CT, computed tomography.

## Comments

This is a nice video demonstrating resection of a foramen magnum meningioma through a paramedian skin incision and a hemilaminectomy. Performing microdissection between and around the C2 nerve roots and spinal accessory nerve is shown. This is a nice approach for meningiomas ventral to the spinal cord and minimizes the skin incision and risk of a pseudomeningocele collection postoperatively.

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## Disclosures

None. The authors have no personal, institutional, or financial interest in any of the materials, drugs, or devices described in this article.