



# Combined Transcavernous and Kawase's Approach for Gross Total Resection of a Cavernous Sinus Meningioma

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## Abstract

### Keywords

- ▶ cavernous sinus
- ▶ chordoid meningioma
- ▶ Kawase's approach
- ▶ Meckel's cave
- ▶ transcavernous approach

Microsurgery of cavernous sinus (CS) lesions is generally considered to be associated with a high rate of morbidity and cranial nerve deficits. The success for surgical removal of CS meningiomas is debatable and achieving a good functional outcome with preservation of the cranial nerves is the goal. Surgery of these lesions is challenging, recurrence rates are high, and therapeutic strategies remain controversial. In this video, we present a case of a CS meningioma that extended to Meckel's cave and the posterior fossa in a 46-year-old woman with history of a left-sided cerebellopontine angle World Health Organization (WHO) grade-I meningioma with extension to the left CS. Seven years ago, she had a microsurgical resection of a Cerebellopontine angle (CPA) meningioma. She later received radiotherapy for the slowly growing meningioma

### Conflict of Interest

None declared.



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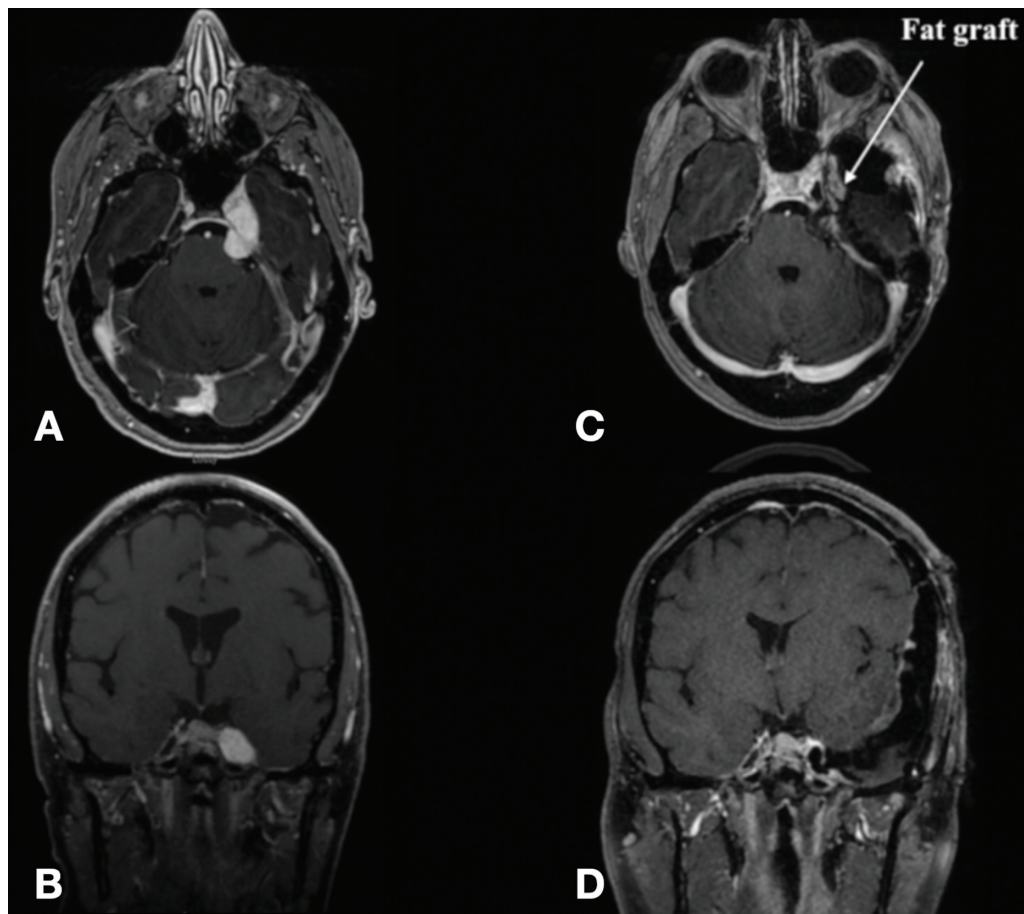
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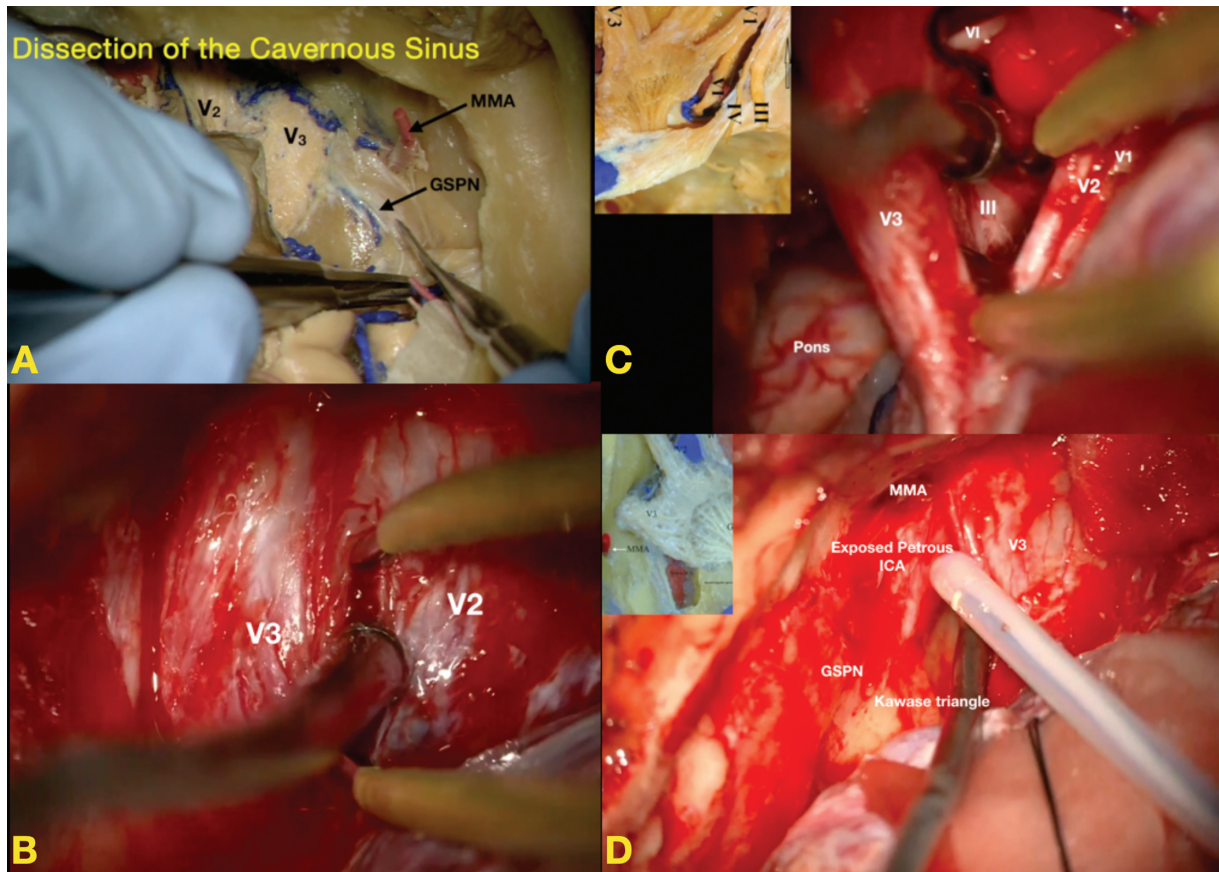
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of the posterior CS. The patient presented with newly onset headache and facial pain. Magnetic resonance imaging (MRI) showed a meningioma of the left CS and Meckel's cave extending into the ambient cistern, with a mild mass effect on the pons, and a size increase compared with prior imaging. Since this area previously received radiotherapy, and the patient was symptomatic from trigeminal compression, the decision was made to proceed with surgical resection of the tumor via combined transcavernous and anterior petrosectomy. Postoperatively, the patient woke up with the same neurological status. MRI confirmed gross total resection of the tumor. The histopathology was a WHO grade-II chordoid meningioma. The patient is currently receiving radiotherapy. This video demonstrates the surgical approach and the resection steps of this pathology.

The link to the video can be found at: <https://youtu.be/HrU1VOzUGWU>.



**Fig. 1** Preoperative axial (A) and coronal (B) T1-weighted MRI with contrast shows left-sided homogenous enhancing cavernous sinus lesion with an extension to the posterior fossa. Postoperative axial (C) and coronal (D) T1-weighted MRI with contrast shows postoperative changes and gross total resection of the lesion from the cavernous sinus with packed fat graft (arrow). MRI, magnetic resonance imaging.



**Fig. 2** Cadaveric and intraoperative photomicrographs. (A) Cadaveric dissection of the cavernous sinus shows the middle meningeal artery (MMA), V2, and V3 branches of the trigeminal nerve, and greater superficial petrosal nerve (GSPN). (B) Intraoperative photomicrograph showing the incision of the membranous layer of the cavernous sinus dura between the V2 and V3 branches of the trigeminal nerve. (C) Intraoperative image of the left cavernous sinus after tumor excision shows the branches of the trigeminal nerve (V1, V2, and V3), oculomotor nerve (III), and the abducens nerve (VI) in the lateral wall of the cavernous sinus. Inset shows the cadaveric dissection of the same region. (D) Intraoperative image of the middle cranial fossa with an inset of cadaveric picture of the same region. Note the exposed petrous internal carotid artery (ICA), and the Kawase's triangle bounded by the petrous ridge, GSPN, and the V3 branch of the trigeminal nerve. MMA, middle meningeal artery.