Gross Total Resection of a Recurrent Cavernous Sinus Meningioma through a Combined Transzygomatic Transcavernous and Extended Middle Fossa Approach with Cavernous Carotid Denudation

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Abstract

Objective The aim of this study is to describe surgical management of invasive cavernous sinus meningioma with a combination of skull base approaches.

Design This study is an operative video.

Results Resection of the recurrent skull base meningioma is still challenging, especially if the tumor involves or encases the carotid artery. In this video, we describe our experience with the successful treatment of a recurrent skull base meningioma, which involved the entire cavernous sinus and the internal carotid artery. A 53-year-old male presented with a 1-year history of progressing right-side complete oculomotor palsy and facial dysesthesia. The patient had previously undergone craniotomy for the right-side petroclival cavernous meningioma (►**Fig. 1A** and **B**). Total 8 years after the first surgery, the remaining portion of the cavernous sinus grew up and extended into the posterior fossa (►**Fig. 1C**). Then the second surgery was performed to resect only the posterior fossa component (►**Fig. 1D**). However, the follow-up magnetic resonance imaging revealed an aggressive tumor regrowth in 2 years. The tumor occupied the right middle fossa with an extension to the posterior fossa and infratemporal fossa

Keywords
- cavernous meningioma
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- transcavernous approach
- transzygomatic approach

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(►**Fig. 1E** and **F**). We scheduled to perform gross total resection of the tumor through a combined transzygomatic transcavernous and extended middle fossa approach with preparation for vessel reconstruction. Mild adhesion between the tumor and the cavernous carotid artery facilitated complete resection of the intracavernous component of the tumor (►**Fig. 2A–C**).

Conclusion A combination of skull base approaches provides multidirectional operative corridors and wide exposure of the skull base lesions.

The link to the video can be found at https://youtu.be/DB_WXFeyBvo.

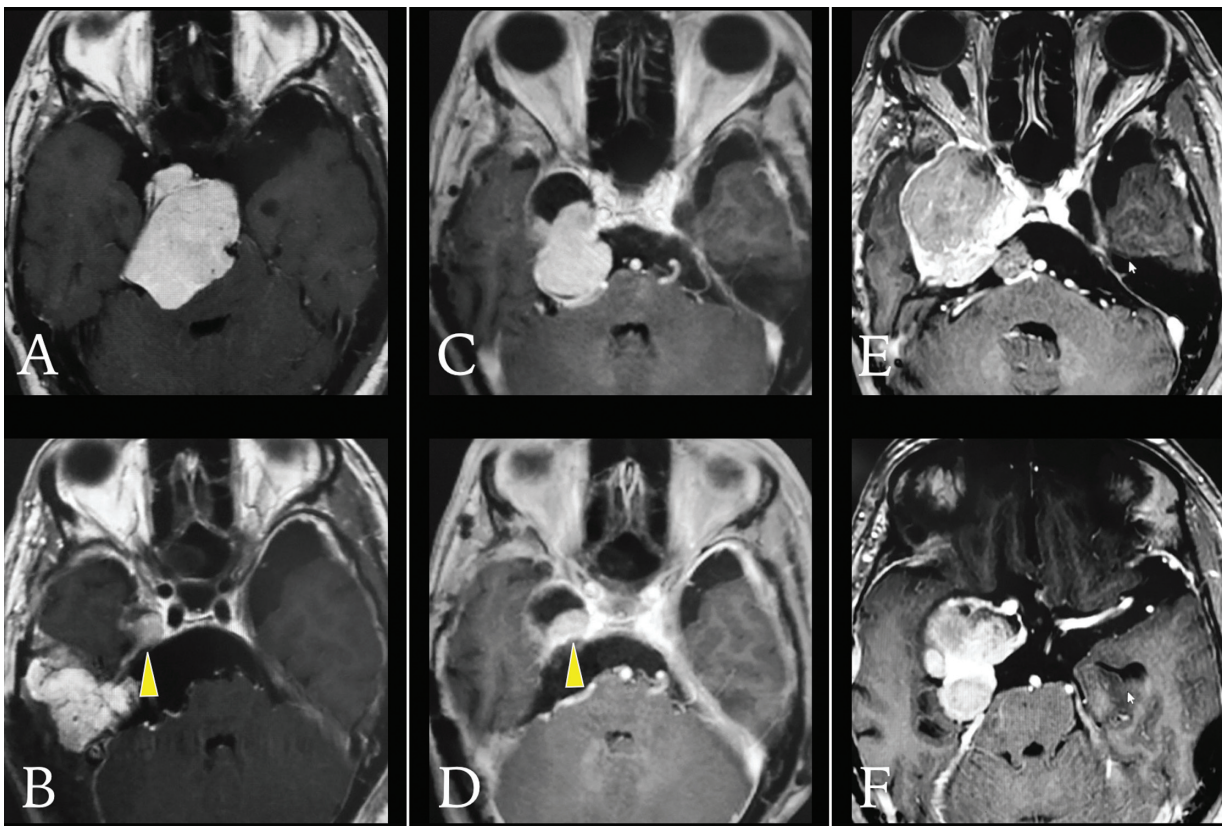

Fig. 1 Pre- and postoperative MRI. (**A**) Preoperative postcontrast MRI of the first surgery demonstrates a right-sided large cavernous-petroclival meningioma with severe compression of the brainstem. (**B**) Postoperative MRI of the first surgery demonstrates a small residual tumor at the right cavernous sinus (yellow arrowhead). (**C**) Preoperative MRI of the second surgery demonstrates tumor regrowth of the residual cavernous portion with extension to the right posterior fossa. (**D**) Postoperative MRI of the second surgery demonstrates a residual tumor at the right cavernous sinus (yellow arrowhead) (**E**), (**F**) preoperative MRIs of the third surgery demonstrate aggressive tumor regrowth. A large tumor occupies the right middle fossa with multidirectional extension with engulfment of the right cavernous carotid artery. MRI, magnetic resonance imaging.

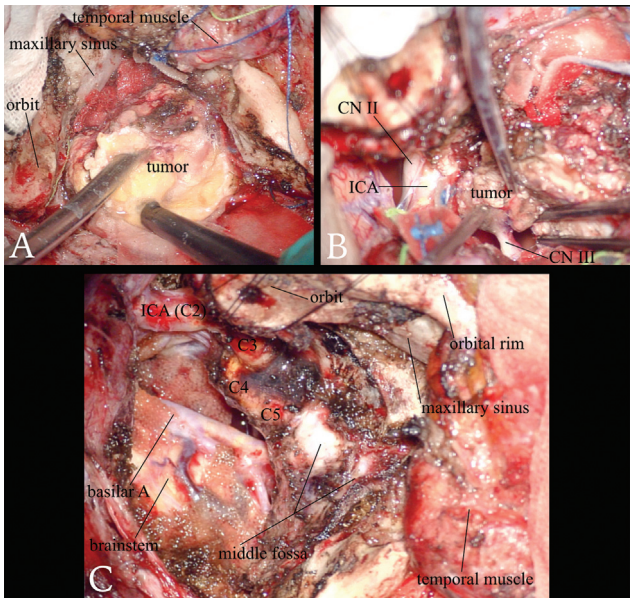

Fig. 2 Intraoperative still images. (**A**) Resection of the right middle fossa component of the tumor using an ultrasonic aspirator. (**B**) The right oculomotor nerve is involved entirely by the tumor. (**C**) Final view of the gross total resection of the tumor through a transzygomatic-transcavernous and extended middle fossa approach. The cavernous segment of the right carotid artery is denuded with the removal of the intracavernous component of the tumor. The lateral aspect of the brainstem is well exposed.

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Conflict of Interest
None declared.