

Microsurgical Resection of a Giant Rhabdoid Meningioma Encasing the Cavernous Carotid Artery Complicated by Postoperative Vasospasm

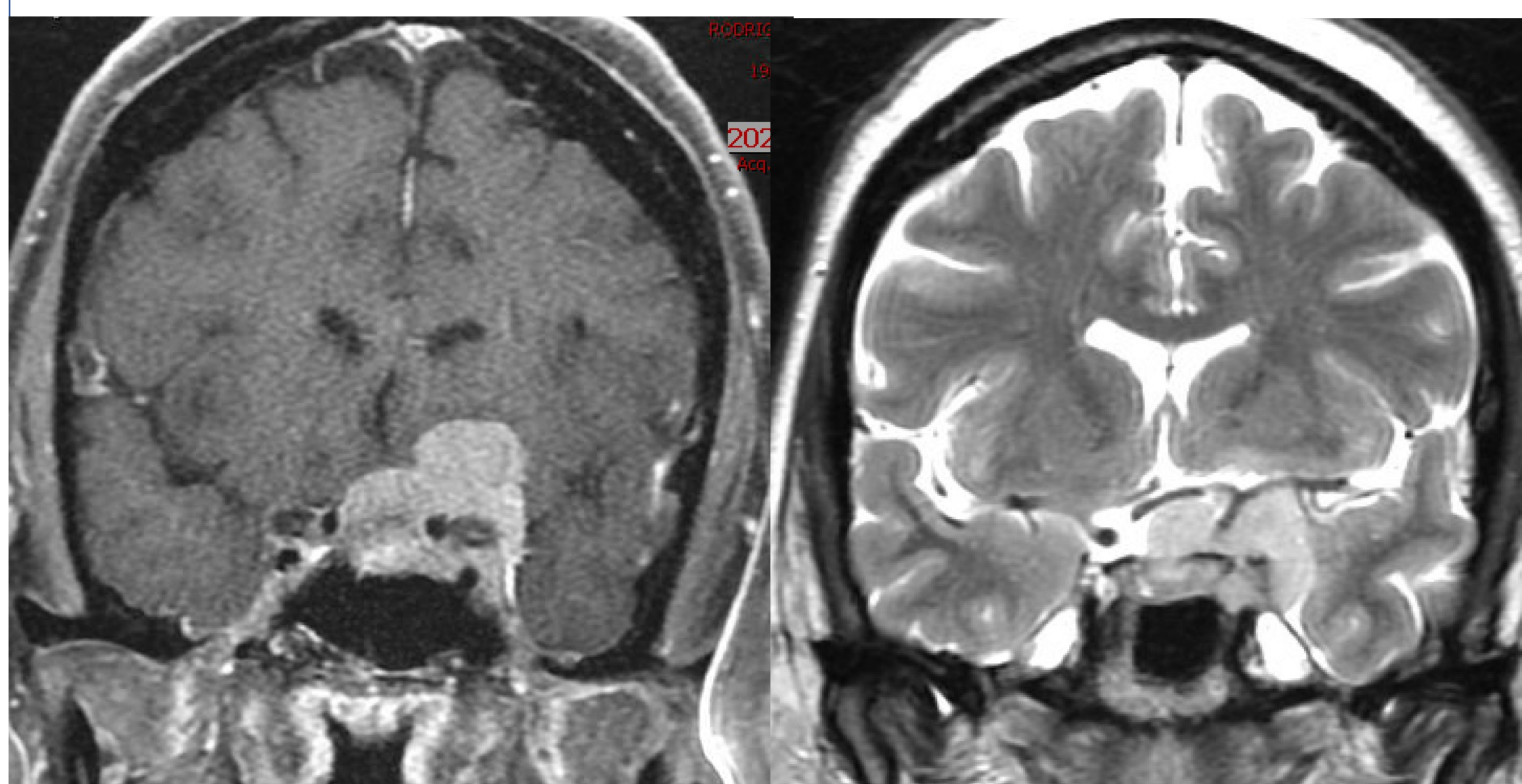
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Abstract

In this operative video we demonstrate the microsurgical resection of a giant cavernous sinus meningioma in a 55-year-old woman presenting with severe left eye vision loss. Tumor resection was difficult due to the encasement of cavernous carotid artery and severe compression of the left optic nerve. Postoperatively the patient developed vasospasm which was treated with intra-arterial milrinone. At 1-year follow-up, she was independent for all activities (mRS 1) and returned to work.

Clinical Presentation

55-year-old woman presented with severe left eye vision loss. MRI showed a giant left sphenocavernous meningioma measuring 3.2 x 3.4 x 2.9 cm and encasing the left internal carotid artery (ICA), the left middle cerebral artery (MCA), and severely compressing the left optic nerve.



MRI obtained 3 years prior for headaches showed no tumor – indicating rapid interval tumor growth. Cerebral angiogram showed narrowing of the encased ICA (Hirsch Grade III). The tumor received blood supply from left meningohypophyseal trunk (MHT) which we embolized with polyvinyl alcohol.



Rationale for the Procedure

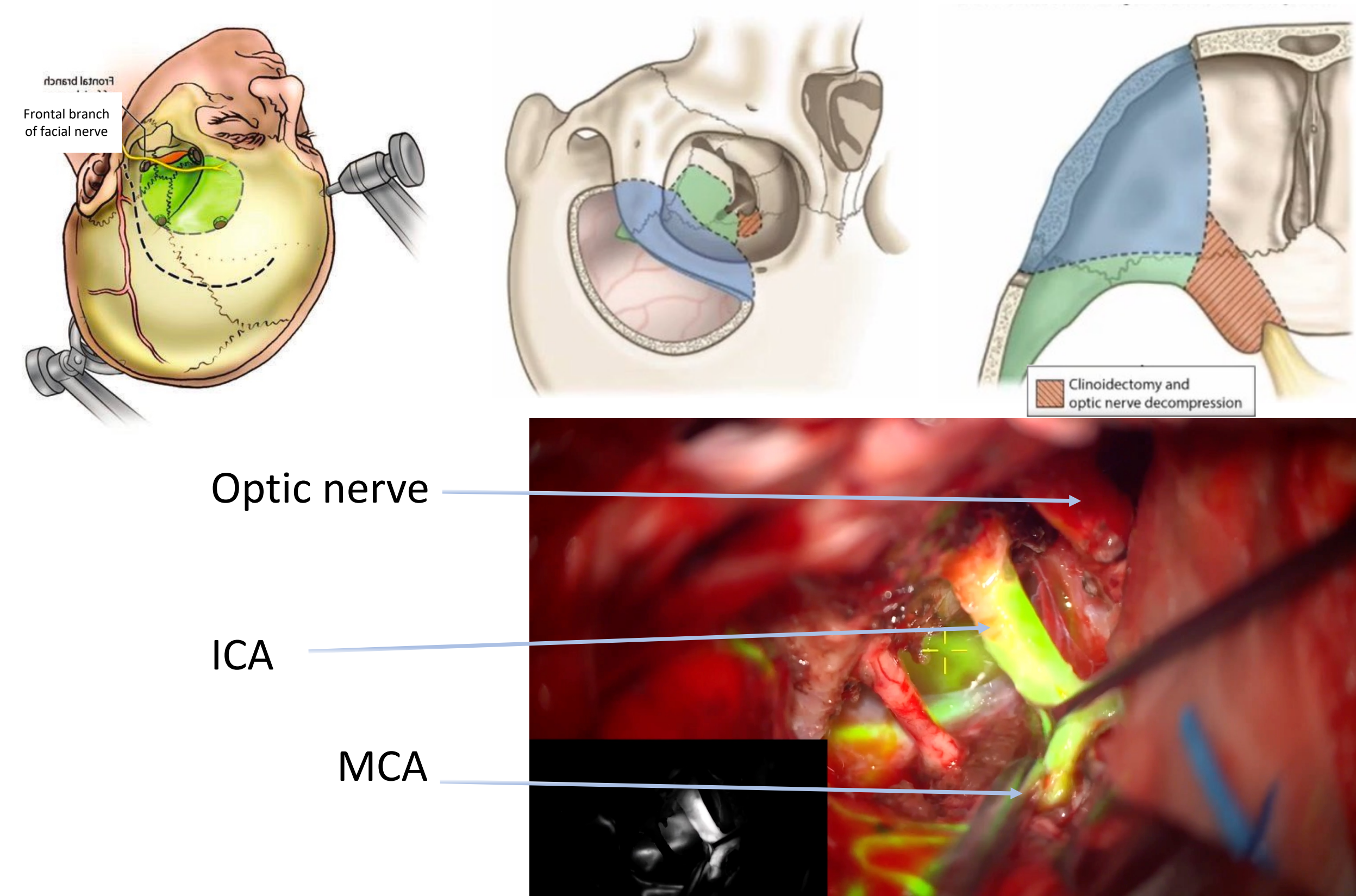
Surgical resection of the tumor was recommended because of

- Risk of ischemic stroke if left untreated due to the rapid tumor growth with encasement and stenosis of the ICA and the MCA
- Severe vision loss in the left eye due to progressive tumor growth
- Giant size of the tumor which caused significant mass effect on the surrounding brain and neurovascular structures

Preparation for EC-IC high-flow bypass was made in case of inadvertent intraoperative injury to the ICA during tumor resection

Key Surgical Steps

- Positioned supine in 3-point pins with head turned 45-degrees towards the right side extended and elevated
- Left cranium, left neck, and left thigh were prepared in a sterile fashion
- Left frontotemporal craniotomy and orbitotomy
- Anterior clinoidectomy
- Extradural optic nerve decompression
- Near total tumor resection
- Closure of the anterior clinoid process with pericranium and fat graft



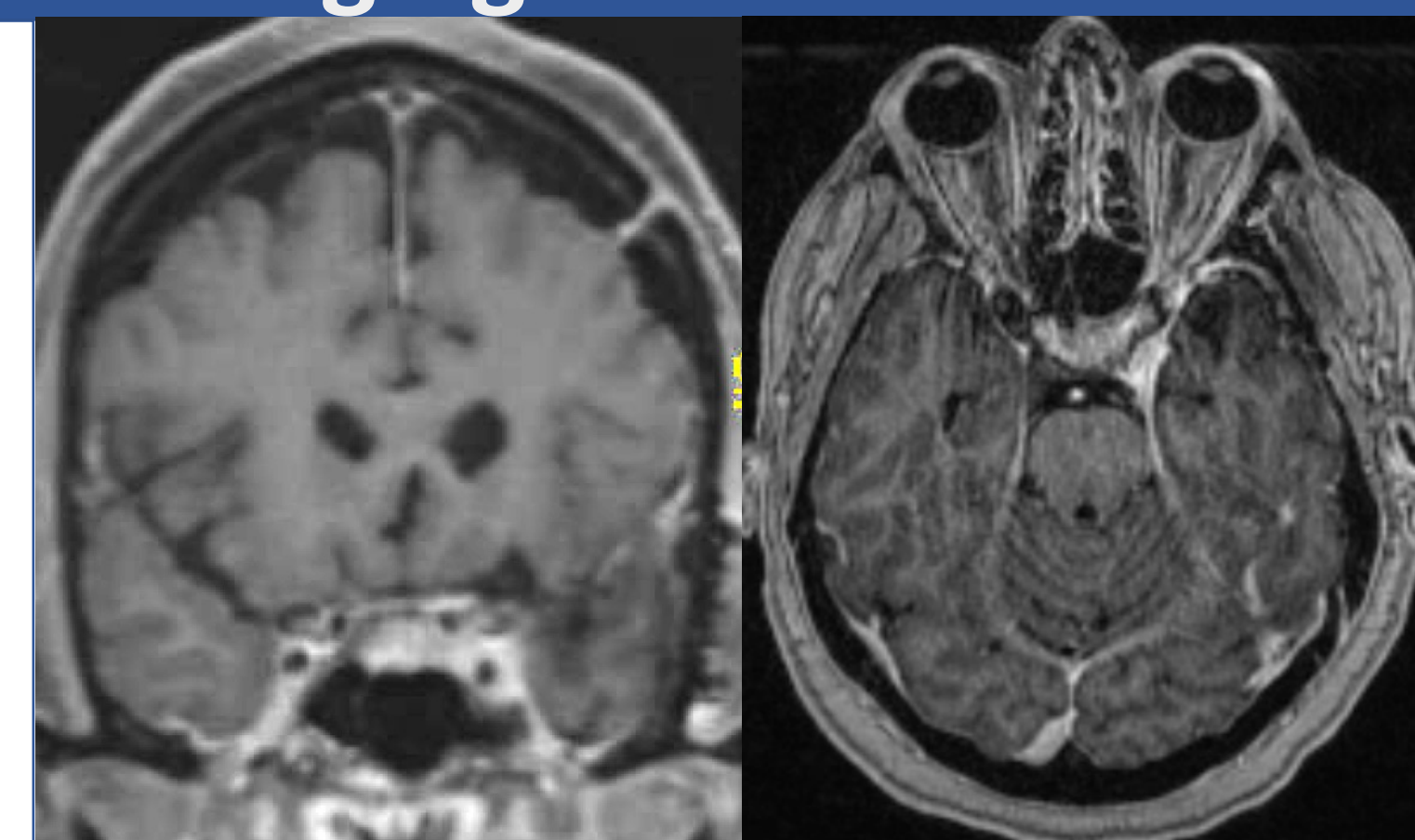
Postoperative Vasospasm

- Near total resection was achieved. Tumor histopathology indicated a WHO grade 1 meningioma, but Rhabdoid features with a proliferative index (Ki-67) of 1-3%
- Developed symptomatic vasospasm on POD6
- Treated with intraarterial Milrinone x2
- CT perfusion improved post-milrinone
- However, vision worsened after vasospasm (extremely poor at baseline 'was able to see faces before surgery')
- Developed complete left-eye blindness due to vasospasm
- Speech and hemiparesis resolved
- Discharged to inpatient rehab 4weeks post-operation



Clinical and Imaging Outcome

At 4-week follow-up, she recovered fully except for left eye vision (mRS 1). Minor residual tumor was treated with Gamma Knife Radiosurgery in 5 sessions. 1-year follow-up MRI showed a small stable residual tumor.



References

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2. Couldwell WT, Kan P, Liu JK, Apfelbaum RI. Decompression of cavernous sinus meningioma for preservation and improvement of cranial nerve function: Technical note. *J Neurosurg.* 2006;105(1):148-152.