Middle Cerebellar Peduncle Approach for Resection of Large Pontine Cavernous Malformation

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Abstract

We present a female in her seventies who presents with progressive cranial neuropathies and gait decline found to harbor a large pontine cavernous malformation. MRI demonstrated a left-eccentric lesion with hemosiderin rim, edema, and effacement of pontine structures.

Given its location, a left retrosigmoid craniotomy with middle cerebellar peduncle entry was performed. Microsurgical resection achieved gross total removal while preserving critical perforators and cranial nerves.

Postoperative imaging confirmed complete resection, and the patient experienced marked neurological recovery, regaining strength, gait, and cranial nerve function.

Introduction

Clinical History

Female in her seventies who presents with progressive left facial numbness, right upper extremity paresthesias, diploid, dysphasia, nausea, and gait instability. Patient at the time of presentation was wheelchair bound. She was diagnosed with a large pontine cavernous malformation 3 years prior that was discovered in the workup of ocular migraines. It was never treated and did not undergo surveillance imaging.

Exam:

Left CN VI palsy, RUE/RLE/LLE 4+/5 strength, RUE/RLE diminished sensation to light touch

Diagnosis:

A pontine cavernous malformation is a vascular lesion composed of dilated, thin-walled capillary channels.[1] Due to the dense concentration of cranial nerve nuclei and long tracts within the pons, even small hemorrhages can produce significant neurologic deficits, and these lesions carry a higher risk of symptomatic re-bleeding compared with supratentorial cavernous malformations.[1]

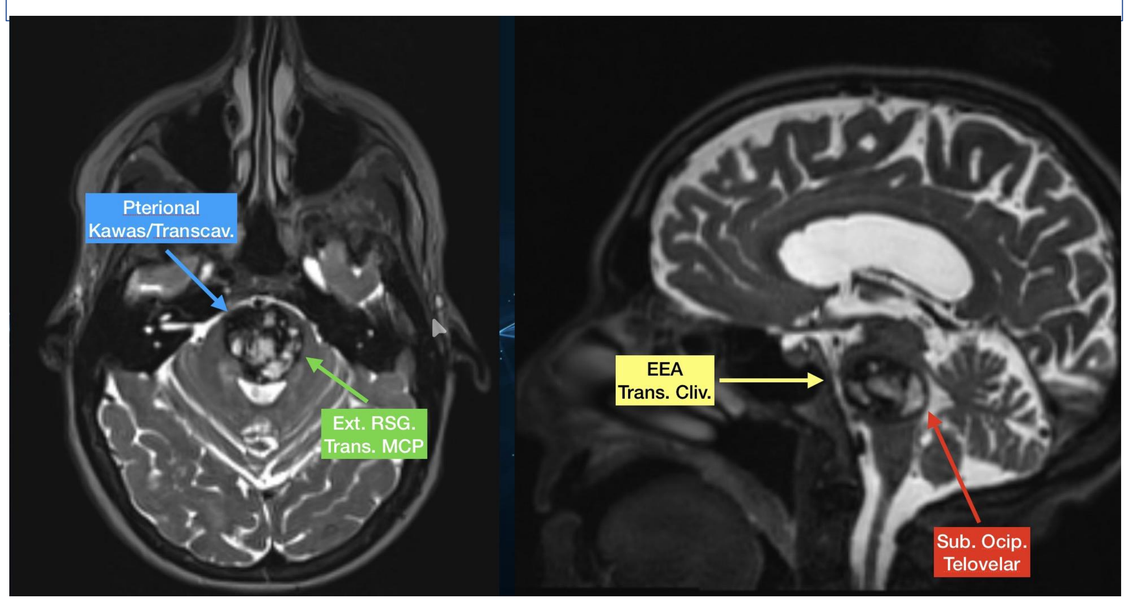

Figure 1. MRI Brain T2 weighted axial and sagittal views demonstrating a large left eccentric central pontine cavernous malformation with mixed density and a hemosiderin ring. There is effacement of the pontine structures. Operative Approaches that were considered include pterional with a kawasi approach, endoscopic endonasal trans clinal approach, sub occipital telovelar approach, and extended retrosigmoid approach with trans middle cerebellar peduncle (MCP) approach. The extended retrosigmoid trans. MCP was selected due to reduced risk of morbidity and traverses least amount of eloquent pontine tissue.

Operative Plan

Operative Decision Making:

Patient has suffered from a progressive functional and neurological decline secondary to a large pontine cavernous malformation that has evidence of prior hemorrhage. Given increased risk of re-bleed and degree of neurologic deficit, surgery was recommended for treatment.

Position:

Right lateral park bench position

Approach:

Left sided extended retrosigmoid craniotomy, middle cerebellar peduncle approach

Operation

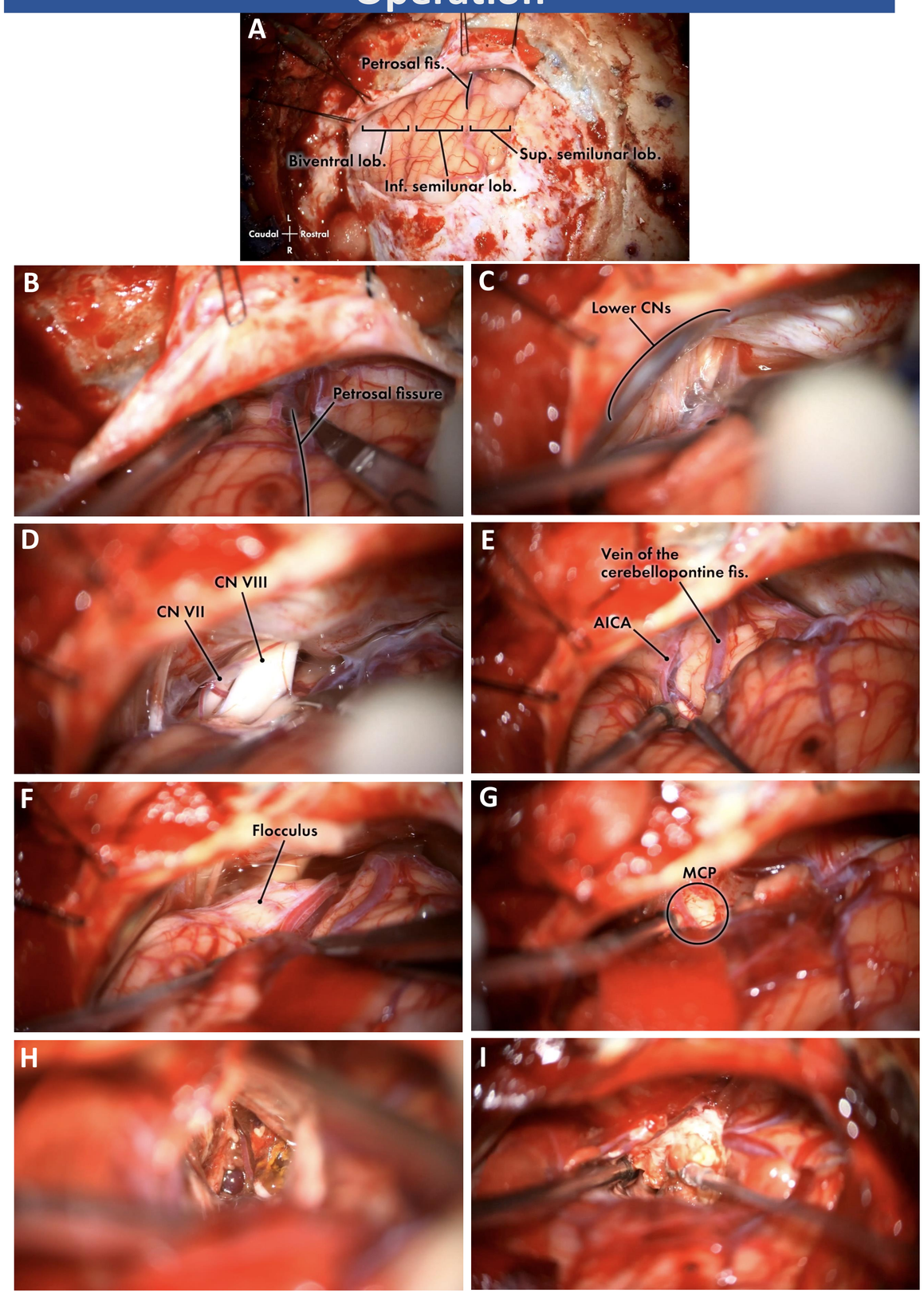

Figure 2. A| Expanded retrosigmoid exposure with dura reflected. B| Petrosal fissure is dissected down towards the MCP. C| Lower cranial nerves are encountered. D| Next, CN VII, VIII are visualized with CN V deeper to them. E| AICA And vein of the cerebellopontine fissure. F| Flocculus is seen and displaced. G| MCP is identified and is the point of entry. H| The cortisectomy is performed and the cavernous malformation is identified deep. I| The cavmal is dissected And removed en block.

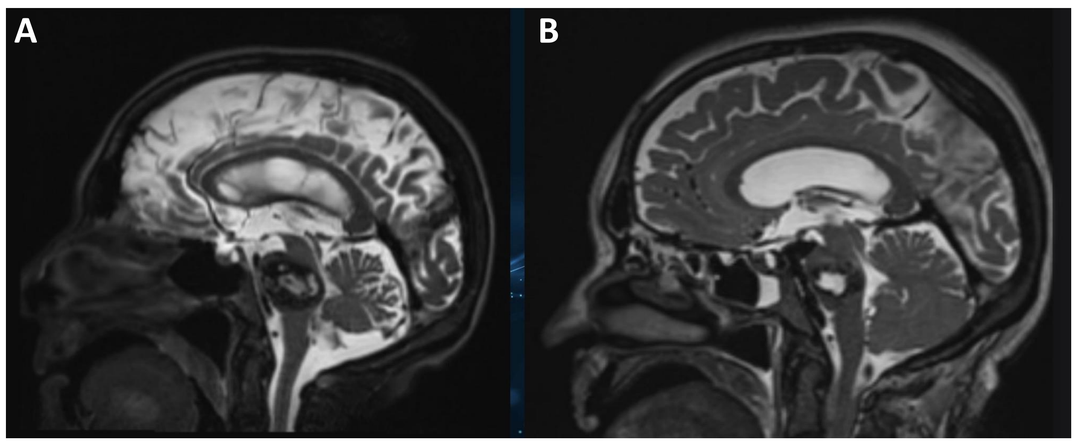

Figure 3. MRI Brain T2 weighted sagittal views comparing the preoperative (A) and postoperative (B) scans. This Demonstrates a complete resection of the pontine cavernous malformation with expansion of previously effaced tracts.

Post Operative Course

Post operatively, patient made a significant neurological improvement.

At 6 month follow up, the patient is ambulatory, independent, with no residual cranial nerve palsy.

Conclusions

In summary, a trans MCP approach is a useful approach for the resection of a pontine cavernous malformation. In this case the patient tolerated the surgery very well and made a remarkable recovery.

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References

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