Lateral transorbital endoscope-assisted approach for resection of left medial sphenoid wing meningioma

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Abstract

Meningiomas of the medial sphenoid wing can present with headaches, seizures, vision changes, cranial neuropathies, or aphasia due to mass effect. While traditional approaches like frontotemporal, minipterional, or orbitozygomatic craniotomies are commonly used, the lateral transorbital endoscope-assisted approach offers direct access to the tumor, facilitating early devascularization and hyperostosis removal and avoiding temporalis muscle manipulation. We present a 59-year-old female with an enlarging medial sphenoid wing meningioma successfully treated using this minimally invasive technique, highlighting its advantages in tumor resection and patient outcomes.

Introduction & Approach Selection

The patient is a 59-year-old female with a high BMI, a relative immunosuppressive state, and multiple pain syndromes that presented with an enlarging sphenoid wing meningioma

Left transorbital endoscope-assisted approach:
- Superior eyelid crease incision (decreased risk of infection given immunosuppressed state; less pain given history of pain sensitivity)[1-4]
- The patient's comorbidities made this approach advantageous, as it circumvents the need for large incisions and temporalis muscle manipulation minimizing pain. In addition, the tumor can be devascularized early on during tumor resection, and the hyperostosis can be directly addressed.

Alternative approaches:
1. Left frontotemporal craniotomy (increased risk of infection, more painful)[5]
2. Left minipterional craniotomy (increased risk of infection, more painful)[6,7]
   - *Lateral approaches can work well for this tumor and are viable options but require large incisions and more muscle dissection.*

Operative Technique

- Lumbar drain placement with intrathecal fluorescein
- Lateral upper eyelid crease incision with dissection of orbicularis muscle and preseptal approach to superior and lateral orbital rim
- Removal of lateral and superior orbital wall (posterior aspect of zygomatic bone, greater wing of sphenoid, and lateral-posterior aspect of orbital plate of frontal bone) between the superior and inferior orbital fissures (orbital rim left in place)
- Tumor resection
- Placement of dural patch, dural glue, and abdominal fat graft
- Suturing closed the pericranium, deep orbicularis muscle, superficial orbicularis muscle and skin

Outcome & Postoperative Course

Simpson Grade 1 resection was achieved.

Postoperative neurologic exam: neurologically intact except for mild left lateral rectus muscle palsy and mild left V1 numbness, both secondary to retraction (resolved by 3-month follow-up)

Lumbar drain removed on POD 4, and patient was discharged home in good condition.

Conclusion

The lateral transorbital endoscope-assisted approach for resection of sphenoid wing meningiomas is a good and viable approach for certain patients, especially those with concern for wound healing difficulty or pain syndromes.

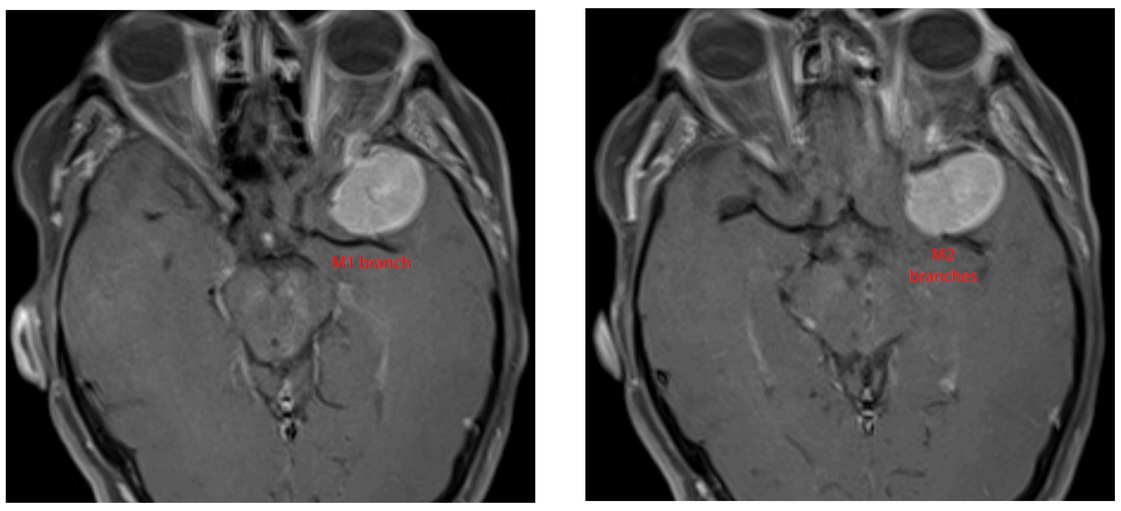

Figure 1. Preop axial T1 post-contrast MRI

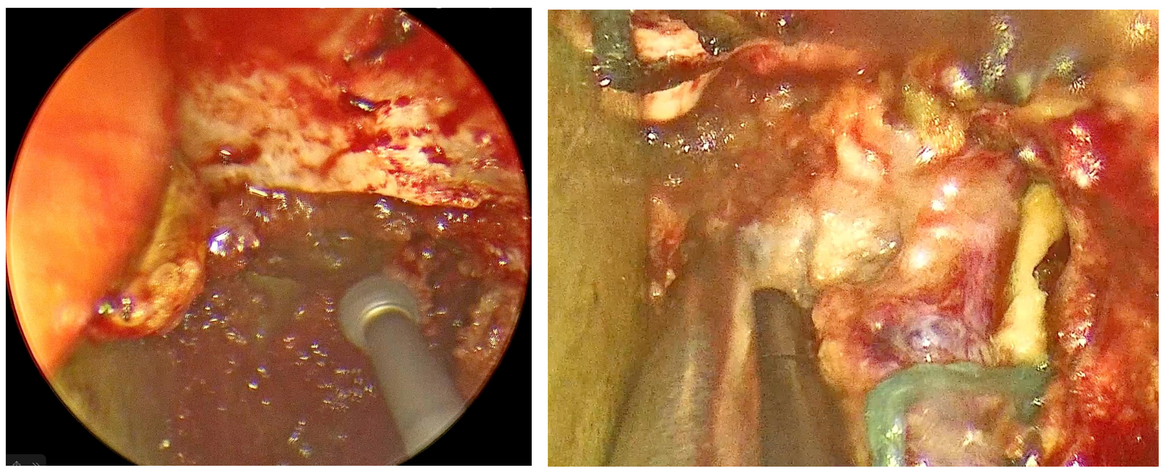

Figure 2. Endoscope view of drilling of lateral wall of orbit and greater wing of sphenoid

Figure 3. Endoscope view of tumor debulking

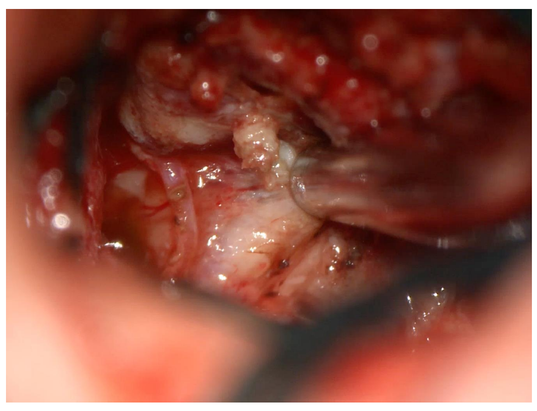

Figure 4. Microscope view of microdissection of MCA vessels

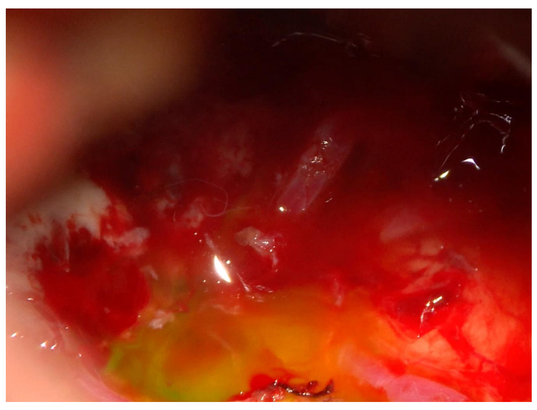

Figure 4. Microscope view of resection cavity with intact MCA vessels

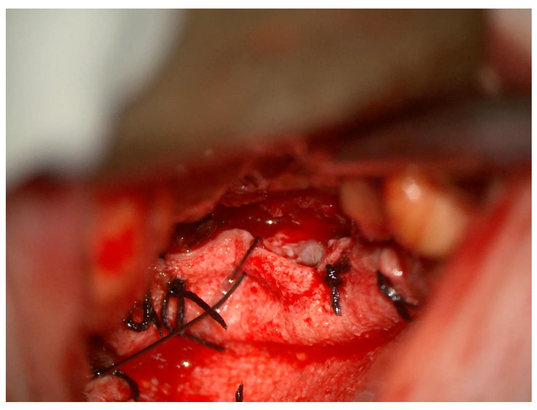

Figure 5. Microscope view of dural closure with patch

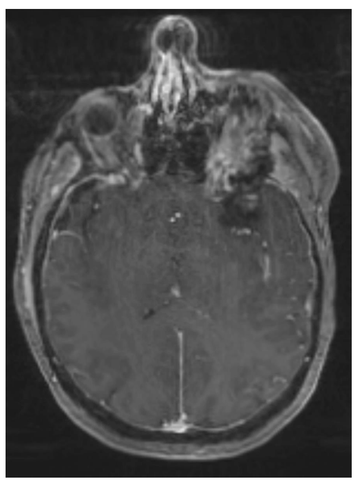

Figure 6. Immediate postop axial T1 post-contrast MRI

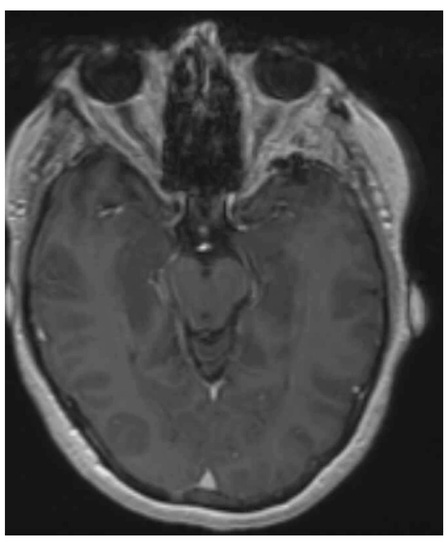

Figure 7. 3 month axial T1 post-contrast MRI

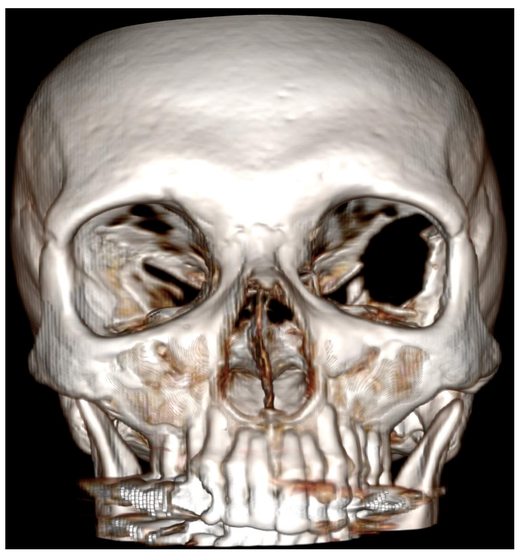

Figure 8. Postop 3D skull reconstruction highlighting the approach through the lateral orbital wall and sphenoid wing

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