



These anatomical images were obtained from cadaveric specimen's studies.

**Figure 1.** This image shows an anterior and posterior ethmoidectomies, and bilaterally sphenoidectomies. **Figure 2.** This image reveals the limits of the transcribiform corridor: posteriorly- planum sphenoidale and tuberculum sellae; laterally- midorbital plane; superiorly- the rectus gyri. **Figure 3.** This image shows the image guidance pointing to left anterior ethmoidal artery. **Figure 4.** This image reveals a wide dural exposure of the anterior fossa. **Figure 5.** The picture shows the base of the frontal lobe (olfactory nerves, rectus gyri and the frontopolar arteries) after removing the dura mater. **Figure 6.** This image noticed a vascularized nasoseptal flap confection that is pivotal for skull base closure.

## Case Presentation

This is a 56-year-old woman who presented with daily headaches and loss of smell during the last six months. On physical examination, no abnormality was noted except for a loss of smells differentiation. During the imaging investigation, a brain magnetic resonance image (MRI) scan revealed a lesion (4,5 x 4,0 x 2,8 cm) at the olfactory groove topography which showed a homogeneous contrast enhancement on T1-weighted MRI, that was compatible with a meningioma. The surgical procedure was performed utilizing an endoscopic endonasal transcribiform approach (EETA). This procedure lasted five hours without complications. The patient was discharged from the hospital on fourth postoperative day. A 6-month brain MRI scan revealed a complete tumor resection.

## Discussion

The introduction of the microneurosurgery brought about an improvement of the surgical results for resections of the anterior skull base lesions. The most common traditional open approaches used for resection of the olfactory groove meningiomas are the pterional, the bifrontal transbasal, and its variations. They have mainly been recommended for large tumors (> 5cm) on the coronal and sagittal plane. The development of the EETA became a minimally invasive option for resection of the selected cases. The main advantages of this approach are a complete removal of the abnormal bone, an early tumor's devascularization, and a lack of brain retraction. The authors chose EETA due to the presence of anosmia, no large extension on the coronal and sagittal plane (< 5 cm), a presence of cortical cuff on T2-weighted brain MRI, a lack of calcification and no vascular tumor involvement.

These factors mentioned above are associated with better surgical results and complications using de EETA. The main drawback of this approach is a higher rate of the cerebrospinal fluid leakage (CSF) in up to 30%, in comparison to open approaches. Thus, it is crucial to avoid its occurrence a multi-layer skull base closure (fascia lata intradurally, dural substitute-extradurally, fat, surgical, and a large nasoseptal flap).

## Final Comments

The EETA is an effective and safe surgical option for selected patients presenting with olfactory groove meningiomas. The surgical options should be based on tumor's volume, presence or lack of vascular involvement, and the surgical team's experience.

## Contact

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## References

- Hadad G, Bassagastegui L, Carrau RL, Mataza JC, Kassam AB, Snyderman CH, Mintz AH. A novel reconstructive technique after endoscopic expanded endonasal approaches: vascular pedicle nasoseptal flap. *Laryngoscope* 116:1882– 1886, 2006.
- Kassam AB, Snyderman CH, Mintz A, Gardner PA, Carrau RL. Expanded endonasal approach: the rostrocaudal axis. Part I. Crista galli to the sella turcica. *Neurosurg Focus* 19: E3, 2005.
- Kassam AB, Thomas A, Carrau RL, Snyderman CH, Vescan A, Prevedello DM, Mintz AH, Gardner PA. Endoscopic reconstruction of the cranial base using a pedicled nasoseptal flap. *Neurosurgery* 63: ONS44–ONS52, 2008.
- Koutourosiou M, Fernandez- Miranda JC, Wang E, Snyderman, CH, Gardner PA. Endoscopic endonasal surgery for olfactory groove meningiomas: outcomes and limitations in 50 patients. *Neurosurg Focus* 37(4): E8, 2014.
- Liu, JK, Hattar, E, Eloy, JA. Limitations of endoscopic endonasal transcribiform approach. *Endonasal Approach for Olfactory Groove Meningiomas: Operative technique and Nuances. Neurosurg Clin N Am.* Jul;26(3): 377-88, 2015.
- Majmundar, N, Kamal, NV, Reddy, R K. Liu, JK, Eloy, JA, Liu, JK. Limitations of the endoscopic endonasal transcribiform approach. *Journal of Neurosurgical Sciences* 62(3): 287-96, 2018. E