



# Endoscopic Endonasal Transcribriform Approach for Anterior Skull Base Lesions Involving the Cribriform

## Plate: Indications, Techniques, and Results in 24 Patients

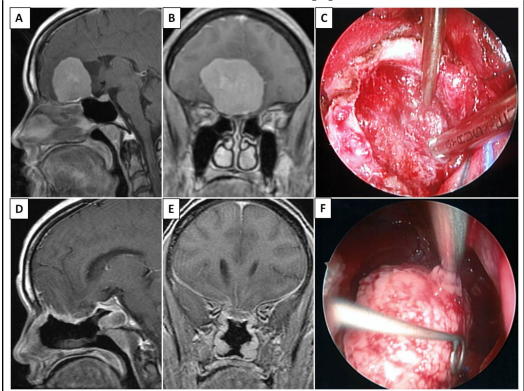
Zachary Scott Mendelson BS; Ahmed Sheikh; Smruti K Patel; Jean Anderson Eloy MD; James K. Liu MD  
Rutgers University, New Jersey Medical School



### Introduction

Pathologies involving the anterior skull base (ASB) have traditionally been treated with a transcranial or craniofacial approach. The endoscopic endonasal transcribriform approach (EEA-TC) is an extracranial approach that provides direct visualization and exposure of the ventral ASB without brain retraction or manipulation of neurovascular structures. In this study, we reviewed our experience with EEA-TC.

**Olfactory Groove Meningioma: GTR via Purel EEA-TC Approach**



Sagittal (A) and coronal (B) pre-operative MRI with gadolinium demonstrating a massive olfactory groove meningioma. Sagittal (D) and coronal (E) post-operative MRI with gadolinium demonstrating complete resection. Intraoperative (C) image showing resection of the fibrous meningioma with the microdebrider. (F) After debulking the meningioma is folded on itself and removed from the intracranial compartment.

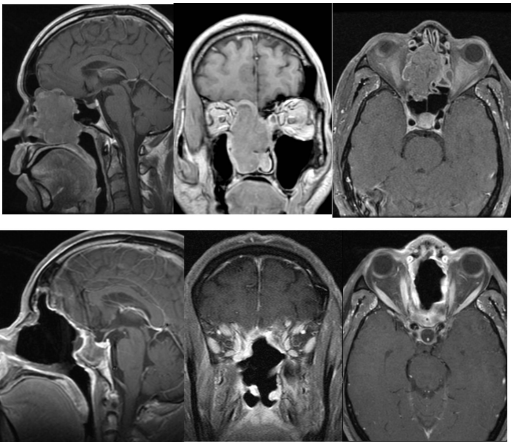
### Methods

Retrospective review of a prospective database of endoscopic skull base procedures performed within a 4 year period revealed 26 patients that underwent EEA-TC for ASB lesions involving the cribriform plate. Twenty-one underwent a pure endonasal approach. Five underwent a combined cranionasal approach (EEA-TC plus transbasal craniotomy) because of significant intracranial tumor extension. The pathologies included olfactory groove meningioma (6), esthesioneuroblastoma (5), encephalocele (3), sinonasal melanoma (2), olfactory schwannoma (2), small cell neuroendocrine carcinoma (2), inflammatory pseudotumoral lesion (1), sinonasal teratocarcinosarcoma (1), osteoblastoma (1), renal cell metastasis (1), adenoid cystic carcinoma (1), and nonspecific adenocarcinoma small blue cell type (1).

### Results

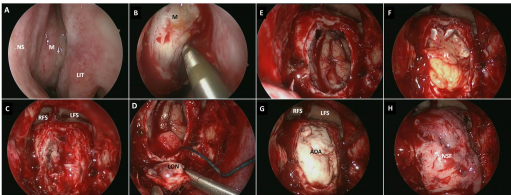
Gross-total resection was achieved in 92.3% (24 cases), and near-total resection was achieved in 7.7% (2 cases). Postoperative complications occurred in four patients, including a postoperative hematoma and delayed brain abscess in one, pneumocephalus and bone flap infection in another, postoperative CSF leak, and a delayed hypertensive hemorrhage. Mean follow-up was 26 months (range: 3 to 53 months).

### Esthesioneuroblastoma: GTR via purely EEA-TC Approach



Sagittal (A) coronal (B) and Axial (C) pre-operative MRI with gadolinium demonstrating an Esthesioneuroblastoma. Sagittal (D) coronal (E) and Axial (F) post-operative MRI with gadolinium demonstrating complete resection of the mass.

### Anterior Skull Base Schwannoma: via EEA-TC



NS, nasal septum; M, mass; LIT, left inferior turbinate; RFS, right frontal sinus; LFS, left frontal sinus; LON, left olfactory bulb, FL, fascia lata graft; ADA, AlloDerm; NSF, nasoseptal flap.

### Conclusions

The EEA-TC is a safe and viable approach for resection of benign and malignant ASB tumors involving the cribriform plate. This can be combined with a transcranial approach in cases with significant intracranial extension. Meticulous multi-layer reconstruction with a nasoseptal flap, pericranial flap, and/or AlloDerm can minimize the risk of CSF leakage.

### Learning Objectives

By the conclusion of this session, participants should be able to:

- 1) Describe the endoscopic endonasal transcribriform approach and when a combined approach may be advantageous.
- 2) Understand the diverse range of lesions that can be accessed using the endoscopic endonasal transcribriform approach.
- 3) Discuss the outcomes that can be expected after resection through the transcribriform approach.

### References

1. Eloy JA, Shukla PA, Choudhry OJ, Singh R, Liu JK: Assessment of frontal lobe sagging after endoscopic endonasal transcribriform resection of anterior skull base tumors: is rigid structural reconstruction of the cranial base defect necessary? Laryngoscope 122:2652-2657, 2012
2. Liu JK, Christiano LD, Patel SK, Tubbs RS, Eloy JA: Surgical nuances for removal of olfactory groove meningiomas using the endoscopic endonasal transcribriform approach. Neurosurgical Focus 30:E3, 2011