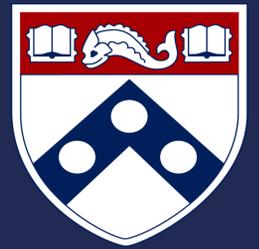


Reconstructive techniques and outcomes in endoscopic endonasal transcribiform resections



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Background

- The introduction of endoscopic endonasal surgery has made possible the resection of cribriform tumors via a **solely endonasal approach**.
- With resection of dura, these cases will have **cerebrospinal fluid (CSF) leaks**.
- While there is substantial literature describing anterior skull base reconstruction broadly, little has been published regarding the cribriform region specifically.
 - One small study¹ described a **fascia inlay, dermal matrix overlay, with an overlying nasoseptal flap coverage**.
 - Other case videos describe a **cartilage graft with overlying free mucosal graft**² or utilizing a **pericranial flap**.³
- In this study, we aimed to **analyze the reconstruction strategies** employed in patients with cribriform defects and their success rates, forming the **largest study** of patients with cribriform defects repaired endonasally.
 - Included an analysis of post-operative length of hospital stay as well

Methods

- We identified adult patients undergoing **endoscopic endonasal resection of tumors** requiring **resection of dura** in the **cribriform** region from 2009—2025.
 - Patients with open resections were excluded.
- Demographic and clinical information were collected via chart review.
 - Including type of reconstruction utilized (**synthetic materials versus thigh fat and fascia**⁴)
- Multivariate regression** was performed with several variables (age, sex, race, smoking status, concurrent diabetes, BMI, benign vs. malignant tumor, and primary vs. revision) to determine which patients were more likely to undergo a certain type of reconstruction.
- Negative binomial regression** was used to analyze if hospital length of stay was associated with more aggressive reconstruction.

Results

- Fifty-one patients were identified** with endoscopic transcribiform resections from 2009 to 2025.
 - 61% (n=31) female and with median age of 56.3 years
- Thirty-one (51%) of patients had esthesioneuroblastomas, 10 (20%) had olfactory meningiomas, and the remaining had other sinonasal tumors (e.g. adenocarcinoma, SNEC, SNUC).
- All patients** had intraoperative CSF leaks after dural resection (**Figure 1A-B**).
- For dural reconstruction, the majority of defects (n=29, 57%) were repaired with a combination of **thigh fascia lata and fat** as a dural inlay and overlay (**Figure 2A**); less frequently, (n=17, 33%) synthetic dural matrix was instead utilized (**Figure 2B**).
 - Rarely was abdominal fat solely used as a subdural layer (n=1, 2%) or no inlay material utilized (n=4, 8%).
- Patients with fat and fascia reconstruction **did not have a longer length of stay** than other types of dural reconstruction (p > 0.05).
- Nasoseptal flaps were used in 48 cases (94%) with free mucosal grafts for 2 patients (4%) and one patient with a pericranial overlay (2%).
- There were **no postoperative CSF leaks**.

Results

Figs. 1-2: Transcribiform defects and repair types

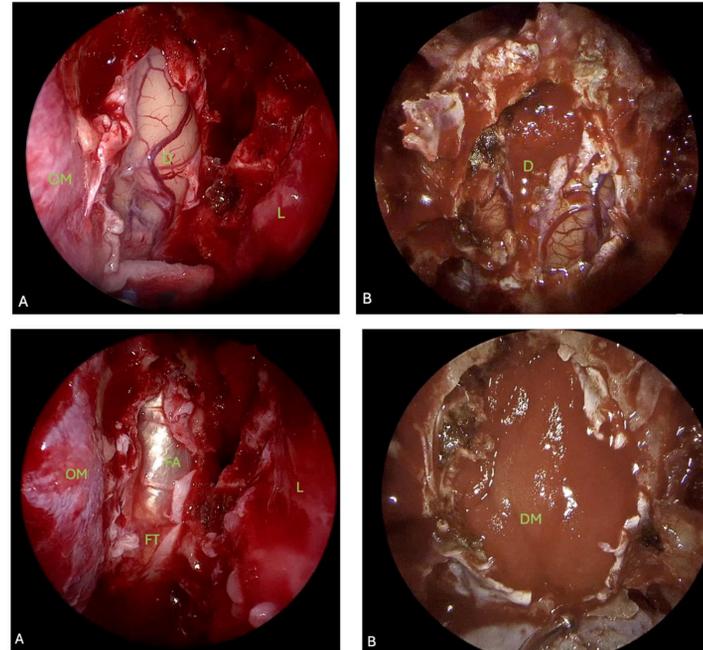


Fig. 1A: Left cribriform defect (D) after unilateral resection. OM-Contralateral (right) olfactory mucosa, L (lamina).

Fig. 1B: Midline cribriform defect (D) after bilateral cribriform resection

Fig. 2A: Fascia (FA) and fat (FT) used as an underlay in a left cribriform defect. OM-Contralateral (right) olfactory mucosa, L (lamina).

Fig. 2B: Synthetic dural matrix (DM) utilized as an underlay in a bilateral cribriform defect.

Table 1. Patient characteristics and reconstruction type

- Male patients** and those with **benign tumors** were more likely to have fat/fascia reconstruction.
- All of the benign tumors were of intracranial origin (**meningiomas**), and thus may have had more intracranial component and **deadspace**, leading to the the use of the fat/fascia inlay.
- Smoking status, diabetes status, and primary vs. revision status did not show a significant effect in reconstruction choice.

| Patient Characteristic | Fat/fascia reconstruction (n=29) | Other reconstruction (n=22) | P value |
|----------------------------|----------------------------------|-----------------------------|--------------|
| Sex | N (%) | N (%) | 0.036 |
| Male | 15 (75) | 5 (25) | |
| Female | 14 (45) | 17 (55) | |
| Race | | | 0.4 |
| White | 25 (60) | 17 (41) | |
| Black | 1 (25) | 3 (75) | |
| Other/unknown | 3 (60) | 2 (40) | |
| Smoking | | | 0.5 |
| Never | 20 (61) | 13 (39) | |
| Former or current | 9 (50) | 9 (50) | |
| Diabetes | | | 0.7 |
| Non-diabetic | 21 (55) | 17 (45) | |
| Diabetic | 8 (62) | 5 (39) | |
| Pathology | | | 0.03 |
| Malignant | 20 (49) | 21 (51) | |
| Benign | 9 (90) | 1 (10) | |
| Primary vs revision | | | >0.9 |
| Primary | 23 (56) | 18 (44) | |
| Revision | 6 (60) | 4 (40) | |

Conclusions

- With a **postoperative CSF leak rate of 0%** overall, we showed success with both dural substitutes and fat/fascia inlays as reconstructive techniques. A small minority of patients had no inlay layer.
- Male patients** and those with **benign tumors** were more likely to undergo fat and fascia reconstruction vs. a dural substitute, which may be a result of tumor location.
- Fat/fascia reconstruction did not prolong hospital length of stay.

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