Challenges and Surgical Nuances in Reconstruction of Large Planum Sphenoidale Tuberculum Sellae Defects After Endoscopic Endonasal Resection of Parasellar Skull Base Tumors

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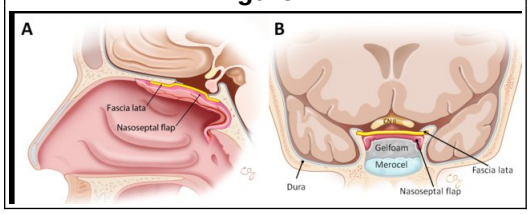
Introduction

Endoscopic endonasal transplanum transtuberculum resection of anterior skull base (ASB) tumors often results in large skull base defects. Recent studies have postulated that defects in this specific location may be associated with an increased rate of postoperative cerebrospinal fluid (CSF) leakage. In this study, we review our experience with reconstruction of planum/tuberculum sellae defects after endoscopic endonasal resection of ASB tumors.

Methods

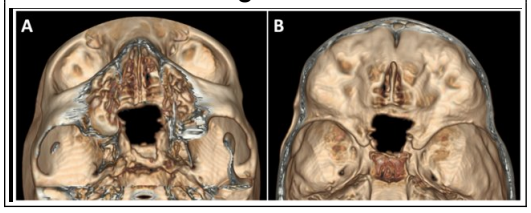
A retrospective analysis was performed on patients undergoing reconstruction of planum/tuberculum sellae defects after purely endoscopic endonasal transplanum transtuberculum resection of parasellar tumors.

Figure 1



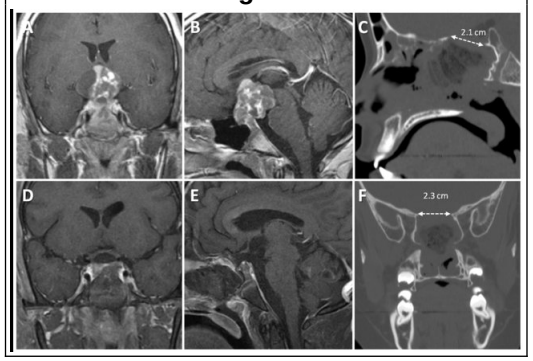
Reconstruction technique for repair of large transplanum skull base defects using an autologous fascialata outerlay graft and a vascularized pedicled nasoseptal flap.

Figure 2



3D CT recon showing transplanum defect

Figure 3

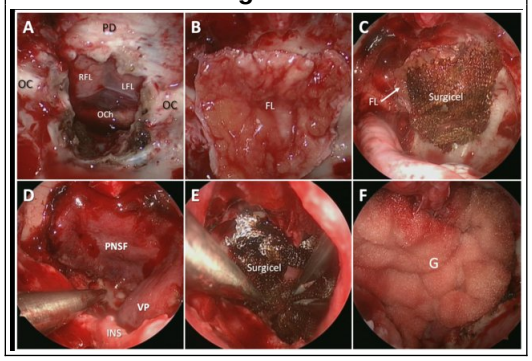


Preop (A and B) and Postop (D and E) MRI of a retrochiasmatic craniopharyngioma removed through endoscopic transplanum approach. The defect is noted on postop CT (C and F)

Results

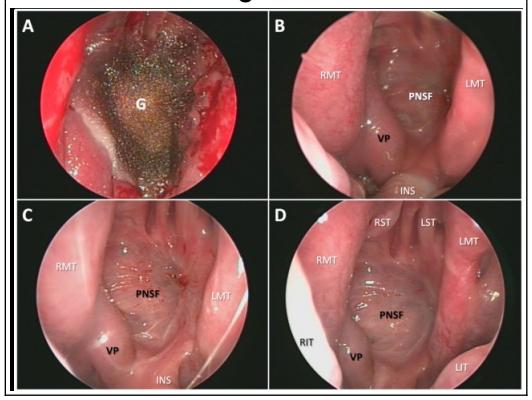
Eighteen patients who underwent 21 repairs with a pedicled nasoseptal flap (PNSF) were identified. The mean age was 49.6 years (range, 18-68 years). The average defect size was 5.6 cm2 (range, 2.16 – 10.36 cm2). Three patients necessitated a repeat procedure due to the following: delayed CSF leak after office nasal debridement, occult benign intracranial hypertension, and intraventricular tension pneumocephalus. All 3 revisions were reconstructed with the previously used PNSF. The mean follow-up period was 8.3 months (range, 1 to 17 months). The overall success rate was 85.7 % for planum/tuberculum sellae defects, as compared to 96.8% for our overall comprehensive PNSF experience for all types of skull base defects.

Figure 4



A: Right (RFL) and left (LFL) frontal lobes, and optic chiasm (Och) are visualized through the defect of the planum dura (PD). B: Fascia lata (FL) is laid over dura. C and D: The vascularized pedicled nasoseptal flap (PNSF) is rotated to cover the skull base repair. E and F: Surgicel, Gelfoam and a Merocel tampon are used to close.

Figure 5



Postop photographs of PNSF repair of transplanum defect at 2 weeks (A), 3 months (B), 4 months (C), and 6 months (D). RMT = right middle turbinate; LMT = left middle turbinate; PNSF = pedicled nasoseptal flap; VP = vascular pedicle; INS = inferior nasal septum; RST = right superior turbinate; LST = left superior turbinate; RIT = right inferior turbinate; LIT = left inferior turbinate.

Conclusions

Repair of large planum/tuberculum sellae defects after endoscopic resection of ASB tumors presents a unique challenge. Using a PNSF along with meticulous multi-layer closure may help decrease postoperative CSF leaks. Undiagnosed pathologies such as benign intracranial hypertension should be identified since they can compound the risk of failure. Although we do not routinely use postoperative CSF diversion in planum/tuberculum sellae repairs, this may be necessary in select cases, such as benign intracranial hypertension, to prevent postoperative CSF leakage.

References

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