Editorial

Vascularized flap reconstruction for CSF leaks during endoscopic skull base surgery

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In the current issue of *Neurosurgical Focus*, Thorp et al. present their extensive experience with endoscopic skull base reconstruction using vascularized flaps in more than 150 patients.³ In what is one of the largest reported series of endoscopic vascularized flap repairs, the authors report an overall postoperative CSF leak rate of 3.3% (among only patients with intraoperative CSF leaks). As this article highlights, the evolution of skull base reconstruction and CSF leak repair has undergone a major upheaval over the past decade, due primarily to the increasing popularity of extended endoscopic endonasal approaches and more routine use of the Hadad-Bassagasteguy nasoseptal flap.^{2,4}

One of the inherent and major drawbacks associated with endonasal surgery for intracranial pathology is the risk for developing postoperative CSF rhinorrhea and its associated counterparts, meningitis and pneumocephalus. The advent and widespread dissemination of pedicled nasoseptal flap repair has provided endoscopic skull base surgeons with the peace of mind required to perform extended endonasal approaches and address complex skull base pathology without being plagued by a postoperative CSF leak rate of 20%–30%, as was the case roughly a decade ago. As indicated by Thorp et al., the incidence of postoperative CSF leaks in experienced centers routinely performing this type of vascularized repair has approached some of the best rates reported in direct transphenoidal series for sellar pathology over the past few decades. There is, therefore, little doubt that the nasoseptal flap is effective in preventing postoperative CSF leaks.

What is called into question by this report, however, are the specific indications for using a vascularized nasoseptal flap. As indicated by the authors, they routinely perform a rescue flap exposure that can be subsequently con-

verted to a full nasoseptal flap in the event of intraoperative CSF leak development. In cases in which there is a high likelihood of high-flow CSF fistula or a planned extended approach, a nasoseptal flap is developed at the onset. Stated differently, the authors ended up using nasoseptal flap reconstruction in all cases in which intraoperative CSF leakage was identified, including 58 pituitary adenomas comprising 46% of their series. Given the reported morbidity associated with flap utilization (for example, crusting and mucocoele formation), increased operative times, and routine resection of the middle turbinate, one wonders whether implementation of a graded CSF leak repair approach, as reported by Esposito et al., and routinely used by others, may be a more prudent strategy.¹ At our institution, we use rescue flaps and a similar graded repair methodology and reserve the use of pedicled nasoseptal flaps for high-flow CSF leaks communicating with the ventricles or cisternal spaces, extended approaches, and the 1%–2% of patients who develop postoperative CSF leaks. To the authors' credit, none of the postoperative CSF leaks in their series developed in patients with "standard" sellar pathology (for example, pituitary adenomas or Rathke cleft cysts). Another important finding was that radiation treatment was not associated with an increased incidence of CSF leaks repaired using nasoseptal flaps.

Will a pedicled nasoseptal flap therefore become the standard closure technique for all endoscopic endonasal operations with identified intraoperative CSF leaks? Is empiric (nongraded) vascularized flap reconstruction warranted for repairing all intraoperative CSF leaks? Should a vascularized flap be reserved for cases of failed standard CSF leak reconstruction using more traditional autologous tissue or allograft techniques? Further experience with routine versus selected/graded utilization of vascularized flap reconstruction for both direct and extended endoscopic approaches involving intraoperative CSF fistulas and a more thorough analysis of sinonasal morbidity, quality-of-life considerations, and the risk/benefit ratio of this and other approaches to skull base reconstruction will help shed light on these important questions. Although more research is needed in this area, the authors are to be commended for reporting their experience and success with this technique in the new era of endoscopic skull base surgery.

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Disclosure

The author reports no conflict of interest.

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