ABSTRACT

Objectives: The introduction of the pediced nasoseptal flap (NSF) has decreased postoperative CSF leak rates from >20% to <5% during expanded endoscopic skull base surgery. The NSF is routinely raised at the beginning of the operation to protect the posterior pedicle during sphenoidotomy. However, in most pituitary tumor cases, an intraoperative CSF leak is not expected. In these cases, a rescue flap approach is used, which consists of partially harvesting the most superior and posterior aspect of the flap to protect its pedicle and provide access to the sphenoid face during the approach. The "Rescue Flap" can be fully harvested at the end of the case if the resultant defect is larger than expected, or if an unexpected CSF leak develops.

Methods: Technical Report

Results: The rescue flap technique allows for binaural and bimanual access to the sella without compromise of the pedicle during the extended sphenoidotomies and tumor removal. If an intraoperative CSF leak is obtained, the rescue flap is then converted into a normal nasoseptal flap for skull base reconstruction.

METHODS AND MATERIALS

Surgical technique

The preparation and initial steps are identical to the NSF harvesting. In brief, the nasal cavity is decongested, the inferior turbinates are outfractured, and one of the middle turbinates (usually the right) is resected to improve visualization and bimanual technique during the pituitary approach. On the side of the middle turbinate resection, one horizontal incision is performed with monopolar cautery over the face of the sphenoid, at the level of the sphenoid ostium. This incision is continued medially over the sphenoid rostrum and then anteriorly into the nasal septum (for approximately 1/3 to 1/2 of the septum - following the sagittal plane). Using an elevator, a mucosal flap is created by raising the mucosa immediately below the incision in a submucoperichondrial/subperisteral fashion, until freeing it to the level (or below) of the floor of the sphenoid. A contralateral wide sphenoidotomy is performed with standard sinus instrumentation. A postero/superior (nasal) septectomy is performed, including the contralateral septal mucosa, but excluding the ipsilateral septal flap/mucosa (protected by raising it in prior step), which is the potential proximal aspect and pedicle of the NSF. A wide sphenoidotomy is performed on the ipsilateral (flap side) side preserving the previously raised flap. Once bilateral sphenoidotomies are performed, the flap is displaced down with a standard Frazier tip suction or rod-lens endoscope for the remaining of the case. If no CSF leaks are encountered, the posterior mucosal flap is repositioned. However, if CSF leaks are encountered, the full NSF flap can be harvested following the standard and previously reported technique.

RESULTS

The rescue flap technique allows for binaural and bimanual access to the sella without compromise of the pedicle during the extended sphenoidotomies and tumor removal. If an intraoperative CSF leak is obtained, the rescue flap is then converted into a normal nasoseptal flap for skull base reconstruction.

DISCUSSION

Reconstruction of the skull base is intended to protect the cranial cavity from the nasal cavity, therefore avoiding CSF leaks, exposure of vascular structures, ascending bacterial colonization and meningitis. Vascularized flaps have shown to be fundamental to decrease the incidence of CSF leaks, however, vascularized tissue is not necessary for small skull base defects without a CSF leak, and its harvest may lead to some degree of donor site morbidity, increased surgical time, postoperative care, and costs.

We have modified our approach for pituitary tumor cases in which an intraoperative CSF leak is not expected, and therefore vascularized flaps for reconstruction not required. In these cases, a rescue flap approach is used, which consists in partially harvesting the most posterior aspect of the flap at the beginning of the operation to protect its pedicle and provide access to the sphenoid face. The NSF can be fully harvested at the end of the case if the resultant defect is larger than expected, or if an unexpected CSF leak develops.

CONCLUSIONS

This new technique allows for sellar tumor removal prior to the nasoseptal harvest; thereby, eliminating donor site morbidity for those pituitary tumor patients whom do not have an intra operative CSF leaks.

REFERENCES