Endoscopic skull base surgery advantages

Endoscopic skull base surgery (ESBS) is a relatively recent addition to the neurosurgical armamentarium. As with many new approaches, there has been significant controversy regarding its value compared with more traditional approaches to ventral skull base pathology. Although early enthusiasm for new approaches that appear less invasive is usually high, these new techniques require rigorous study to ensure that widespread implementation is in the best interest of patients.

Endoscopic endonasal approaches (EEAs) offer the advantages of using preexistent air spaces that enable accessing various areas of the skull base, while avoiding external incisions or scars and obviating the need for the translocation of the maxillofacial skeleton. In addition, EEAs are well suited to preserve neurologic, visual, and masticatory functions as well as cosmesis. However, the sinonasal corridor must be expanded and optimized to access the skull base adequately, facilitate the reconstruction of the surgical defect, avoid sinonasal complications, and minimize sequelae. Important considerations can limit or indicate the approach, such as the nature of the pathology, including location, diagnosis, and vascularity; patient characteristics, including age and medical comorbidities; surgeon attributes, including training, experience, and expertise; the resultant need to reconstruct large skull base defects and feasible alternatives to do so; and institutional resources, including adjunctive services, an intensive care unit, and operating room equipment.

EEAs are important techniques in contemporary skull base surgery. Understanding the indications for and limitations of these approaches help to maximize outcomes.

Schwartz et al., from the Weill Cornell Brain and Spine Center, compared surgical results for ESBS with transcranial surgery (TCS) for several different pathologies over two different time periods (prior to 2012 and 2012-2017) to see how results have evolved over time. Pathologies examined were craniopharyngioma, anterior skull base meningioma, esthesioneuroblastoma, chordoma, and chondrosarcoma.

ESBS offers clear advantages over TCS for most craniopharyngiomas and chordomas. For well-selected cases of planum sphenoidale and tuberculum sellae meningiomas, ESBS has similar rates of resection with higher rates of visual improvement, and more recent results with lower CSF leaks make the complication rates similar between the two approaches. TCS offers a higher rate of resection with fewer complications for olfactory groove meningiomas. ESBS is preferred for lower-grade esthesioneuroblastomas, but higher-grade tumors often still require a craniofacial approach. There are few data on chondrosarcomas, but early results show that ESBS appears to offer clear advantages.
for minimizing morbidity with similar rates of resection, as long as surgeons are familiar with more complex inferolateral approaches.

ESBS is maturing into a well-established approach that is clearly in the patients' best interest when applied by experienced surgeons for appropriate pathology. Ongoing critical reevaluation of outcomes is essential for ensuring optimal results.2

In 2014 Ishii et al., reported the results of 42 EESB surgeries and discussed the advantages and limits of this approach for resecting various types of tumors, and also reported their technique to overcome CSF leakage. All 42 cases involved midline skull base tumors resected using the EESB technique. Dural incisions were closed using nasoseptal flaps and fascia patch inlay sutures. Total removal of the tumor was accomplished in seven pituitary adenomas (33.3%), five craniopharyngiomas (62.5%), five tuberculum sellae meningiomas (83.3%), three clival chordomas (100%), and one suprasellar ependymoma. Residual regions included the cavernous sinus, the outside of the intracranial part of the internal carotid artery, the lower lateral part of the posterior clivus, and the posterior pituitary stalk. Overall incidence of CSF leakage was 7.1%. Even though the versatility of the approach is limited, EESB surgery has many advantages compared to the transcranial approach for managing mid-line skull base lesions. To avoid CSF leakage, surgeons should have skills and techniques for complete closure, including use of the nasoseptal flap and fascia patch inlay techniques.3

References

