WHAT ARE THE LIMITS OF ENDOSCOPIC SINUS SURGERY?: THE EXPANDED ENDONASAL APPROACH TO THE SKULL BASE

Carl H. Snyderman, MD, Ricardo L. Carrau, MD, Daniel Prevedello, MD, Paul Gardner, MD, Amin B. Kassam, MD

The advent of endoscopic technologies and techniques has expanded the limits of conventional endoscopic sinus surgery. The expanded endonasal approach describes a series of surgical modules in the sagittal and coronal planes that allow surgical access to the entire ventral skull base. The sagittal plane extends from the frontal sinus to the second cervical vertebra. The coronal plane extends from the midline to the roof of the orbit, the floor of the middle cranial fossa, and the jugular foramen. Key principles of endonasal skull base surgery are choosing a surgical corridor that minimizes the need for neural and vascular manipulation, team surgery, use of the endoscope to enhance visualization, and bimanual tumor dissection under direct visualization. Particular challenges of the expanded endonasal approach are identification of anatomical structures using unfamiliar landmarks, hemostasis, and dural reconstruction. Over the last decade with more than 1000 completely endonasal skull base surgeries, we have demonstrated that endoscopic endonasal surgery of the skull base can be performed with minimal morbidity and mortality. The introduction of the septal mucosal flap for dural reconstruction has decreased the incidence of postoperative cerebrospinal fluid leaks to less than 5%. Early data suggests that oncological outcomes for malignant sinonasal tumors with skull base involvement are comparable to conventional techniques. Proper training in endonasal surgical techniques is essential to prevent unnecessary morbidity and achieve good outcomes.