

# The Making of a Skull Base Team and the Value of Multidisciplinary Approach in the Management of Sinonasal and Ventral Skull Base Malignancies



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## KEYWORDS

• Endoscopic endonasal surgery • Sinonasal malignancy • Skull base team • Training

## KEY POINTS

- Endoscopic endonasal surgery is true team surgery with concurrent participation of different surgical specialties.
- Benefits of a multidisciplinary team include cross-fertilization of ideas, surgical innovation, and comprehensive patient care.
- Proper training is a key component of building a skull base team.

## CONCEPT OF SKULL BASE TEAM

From the beginning, skull base surgery was at the juncture of multiple specialties and borrowed from the domains of neurosurgery, otolaryngology, head and neck surgery, plastic and reconstructive surgery, and maxillofacial surgery. The development of skull base surgery can be roughly divided into 2 eras, those of open and endoscopic skull base surgery.

The concept of team surgery has evolved during these 2 eras. Open cranial base surgery was predominantly a collaboration of neurosurgeons, head and neck surgeons, and plastic or reconstructive surgeons. In contrast, endoscopic endonasal surgery (EES) is predominantly a collaboration of neurosurgeons and rhinologic surgeons. Differences in training are associated with distinct knowledge and skill sets, as well as oncological philosophy. This may be in transition because more head and neck

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oncologists are gaining endoscopic experience with transoral endoscopic resection of pharyngeal and laryngeal malignancies.

Whereas open cranial base surgery can be characterized as sequential team surgery, in which each surgical specialty works somewhat independently, EES is true team surgery, in which there is simultaneous collaboration throughout most of the surgery. This requires a different type of collaboration but offers the possibility of achieving more than either specialty can achieve alone (**Table 1**).

## ONCOLOGIC TEAM

Oncologic care of sinonasal and ventral skull base malignancy benefits from the inclusion of other specialties with discussion of patients in a tumor board format. This includes other surgical disciplines such as otology, ophthalmology, pediatric neurosurgery and otolaryngology, neuroradiology and pathology, and medical and radiation oncology. Radiologic interpretation requires expertise in neuroradiology and is critical in establishing a differential diagnosis and assessing extent of tumor. Correct pathologic diagnosis is essential; many tumors are misdiagnosed at presentation. Optimal management of some tumors will require a combination of surgical approaches (endonasal, transoral, transfacial, transcervical, transorbital, transcranial, and transtemporal). High-grade malignancies may need adjunctive radiation therapy or chemotherapy following surgery and advanced planning is helpful, especially when referral to a remote radiation therapy center is anticipated. Advanced stage malignancies may receive induction chemotherapy or radiochemotherapy before considering salvage surgery (**Table 2**).

## COMPOSITION OF SURGICAL TEAM

The composition of the skull base team varies depending on the institution, patient population, and type of disease. With EES, the role of the reconstructive surgeon has diminished and the surgical team generally consists of an otolaryngologist (rhinologist) and neurosurgeon. A hybrid team of 2 specialties offers distinct advantages: access to different patient populations and referral sources, different domains of knowledge, and complementary skills. With proper training, however, there is no reason why surgery cannot be performed by 2 neurosurgeons or 2 otolaryngologists working in concert. This may become necessary when surgical specialties are in separate hospitals or there are other disincentives for collaboration.

Who should be performing EES? Ideally, skull base surgeons are trained in all aspects of skull base surgery, including endoscopic and open approaches. Treatment

	Open Cranial Base Surgery	EES of Cranial Base
Team	Sequential	Concurrent
Visualization	3-dimensional, blind spots	2-dimensional, direct visualization
Approach	Convergent, remove or displace structures, brain retraction	Divergent, minimal displacement, no brain retraction
Resection	En bloc, vascular control	Piecemeal, limited vascular control
Reconstruction	Direct dural repair, bone reconstruction, obliteration of sinuses	Inlay or onlay grafts and flaps, no bone reconstruction, drainage of sinuses
Major morbidity	Craniofacial structures	Sinonasal structures

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