

Evidence-Based Practice

Endoscopic Skull Base Resection for Malignancy

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KEYWORDS

- Evidence-based otolaryngology • Malignant cancer • Head and neck cancer
- Endoscopic resection • Skull base

KEY POINTS

The following points list the level of evidence based on Oxford Center for Evidence-Based Medicine guidelines.

- Esthesioneuroblastoma—Endoscopic approaches may provide higher survival rates compared with traditional craniofacial open surgery. Level 2A.
- Sinonasal melanoma—Traditional craniofacial resection remains the gold standard, but endoscopic methods may provide similar rates of long-term survival for patients. Level 4.
- Nasopharyngeal carcinoma—Endoscopic approaches may provide optimistic results, but evidence comparing outcomes with traditional craniofacial resection is lacking. Level 4.
- Sinonasal adenocarcinoma (SNAC)—Endoscopic approaches may provide optimistic results, but evidence comparing outcomes with traditional craniofacial resection is lacking. Level 4.
- Sinonasal undifferentiated carcinoma (SNUC)—Two-year survival rates for endoscopic approaches are encouraging, but further prospective comparative data are necessary. Level 4.

OVERVIEW OF SINONASAL AND SKULL BASE CANCER

Initial interest in endonasal skull base surgery was first described by Caton and Paul in the late 19th century. Since that time, advances in anatomic knowledge, technology, and level of comfort with endoscopic techniques have allowed the use of combined and wholly endoscopic surgery for various sinonasal malignancies. Endoscopy of

Financial disclosures: RBR gratefully acknowledges support from the Doris Duke Charitable Foundation to University of North Carolina for support of the Clinical Research Fellowship. The authors have no other funding, financial relationships, or conflicts of interest to disclose related to this article.

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Otolaryngol Clin N Am 45 (2012) 1127–1142

<http://dx.doi.org/10.1016/j.otc.2012.06.013>

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benign tumors allowed for decreased complication rates, reduction in brain retraction, and minimization of neurologic morbidity. Once surgeons were comfortable with resection of sinonasal and skull base benign tumors, attention shifted toward the use of endoscopic methods for sinonasal malignancy.^{1,2}

Although there has been a shift in interest away from traditional craniofacial resection (tCFR), use of endoscopy has not changed the principles of oncologic surgery. The primary goal is still complete resection of tumor with negative margins and minimization of morbidity.³ The use of endoscopy assists by providing superior visualization, higher magnification of vital structures, assurance of appropriate margins, avoidance of cosmetic deformity, and preservation of normal anatomy.⁴

The endoscopic approach has encountered its own criticisms. Resection of the tumor often requires a piecemeal approach and may theoretically increase the chance of tumor seeding.⁵ Achievement of hemostasis, adequate visualization, and ability to perform reconstruction are additional barriers facing endoscopic approaches. Early results tend to be encouraging, however. A recent literature review found that endoscopy offers better quality of life outcomes than tCFR,⁶ and a second study found a decrease in morbidity when using the endoscopic approach compared with open tCFR.⁷ Although these studies are encouraging, further research is necessary when evaluating the endoscopic resection of malignant tumors.

Malignancies of the sinonasal tract and skull base encompass a heterogeneous, diverse group with respect to etiology, epidemiology, and histology, as classified by the World Health Organization.⁸ As such, treatment of disease must be specifically tailored to each disease process. Reporting on homogeneous skull base outcomes becomes difficult, especially because sinonasal malignancies are rare and thus outcomes often cannot be reported with sufficient power. Because squamous cell carcinoma is so heterogeneous in presentation and outcome, it has been excluded from this review.

INCIDENCE AND EPIDEMIOLOGY OF SINONASAL AND SKULL BASE CANCER

Esthesioneuroblastoma

- Esthesioneuroblastoma, also known as olfactory neuroblastoma, is a rare tumor, constituting only 3% to 4% of all intranasal tumors.^{9,10}
- Esthesioneuroblastoma has a bimodal distribution, with peaks between ages 11 and 20 years and then ages 51 and 60 years.^{11,12}

The precise cause of esthesioneuroblastoma remains unclear, although the cell of origin is believed to be the specialized sensory neuroepithelial olfactory cells normally found in the upper part of the nasal cavity, which includes the superior nasal concha, the upper part of the septum, the roof of the nose, and the cribriform plate of the ethmoid.¹³

Sinonasal Melanoma

- Mucosal melanoma accounted for only 1.3% of 85,000 cases of patients with melanoma during a 10-year period as reported by the National Cancer Data Base.¹⁴
- The incidence of mucosal melanoma differs between geographic and racial boundaries, being particularly common in Japan.¹⁵
- Of those patients with mucosal melanoma, 55% of lesions were found in the head and neck.
- Mucosal melanoma of the head and neck region has a peak incidence in patients aged 60 to 80 years, with a mean age of presentation of 64.3 years.¹⁶

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