Craniopharyngioma endoscopic endonasal approach

The highest priority of current surgical craniopharyngioma treatment is to maximize tumor removal without compromising the patients' long-term functional outcome. Surgical damage to the hypothalamus may be avoided or at least ameliorated with a precise knowledge regarding the type of adherence for each case.

Endoscopic endonasal approach, has been shown to achieve higher rates of hypothalamic preservation regardless of the degree of involvement by tumor\(^1\)\(^2\).

EES was associated with similar, if not better, extent of resection and significantly less ischemic injury than open surgery. Pseudoaneurysms were only seen in the open surgical group. Weight gain was also less prevalent in the EES cohort and appears be correlated with extent of ischemic injury at time of surgery\(^3\).

Schwartz et al., from the Weill Cornell Brain and Spine Center, compared surgical results for Endoscopic skull base surgery (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.

Qiao et al., conducted a systematic review and meta-analysis. They conducted a comprehensive search of PubMed to identify relevant studies. Pituitary, hypothalamus functions and recurrence were used as outcome measures. A total of 39 cohort studies involving 3079 adult patients were included in the comparison. Among these studies, 752 patients across 17 studies underwent endoscopic transsphenoidal resection, and 2327 patients across 23 studies underwent transcranial resection. More patients in the endoscopic group (75.7%) had visual symptoms and endocrine symptoms (60.2%) than did patients in the transcranial group (67.0%, p = 0.038 and 42.0%, p = 0.016). There was no significant difference in hypopituitarism and pan-hypopituitarism after surgery between the two groups: 72.2% and 43.7% of the patients in endoscopic group compared to 80.7% and 48.3% in the transcranial group (p = 0.140 and p = 0.713). We observed same proportions of transient and permanent diabetes insipidus in both groups. Similar recurrence was observed in both groups (p = 0.131). Pooled analysis showed that neither weight gain (p = 0.406) nor memory impairment (p = 0.995) differed between the two groups. Meta-regression analysis revealed that gross total resection contributed to the heterogeneity of recurrence proportion (p < 0.001). They observed similar proportions of endocrine outcomes and recurrence in both endoscopic and transcranial groups. More recurrences were observed in studies with lower proportions of gross total resection.

The extended endoscopic transsphenoidal approach has been more recently developed as a potentially surgically aggressive, yet minimal access, alternative.

Komotar et al performed a systematic review of the available published reports after endoscope-assisted endonasal approaches and compared their results with transsphenoidal purely microscope-based or transcranial microscope-based techniques.

The endoscopic endonasal approach is a safe and effective alternative for the treatment of certain craniopharyngiomas. Larger lesions with more lateral extension may be more suitable for an open approach, and further follow-up is needed to assess the long-term efficacy of this minimal access approach.

Extended endoscopic transsphenoidal approach have gained interest. Surgeons have advocated for both approaches, and at present there is no consensus whether one approach is superior to the other.

With the widespread use of endoscopes in endonasal surgery, the endoscopic transtuberculum transplanum approach have been proposed as an alternative surgical route for removal of different types of suprasellar tumors, including solid craniopharyngiomas in patients with normal pituitary function and small sella.

As part of a minimally disruptive treatment paradigm, the extended endoscopic transsphenoidal
The endoscopic endonasal approach has become a valid surgical technique for the management of craniopharyngiomas. It provides an excellent corridor to infra- and supradiaphragmatic midline craniopharyngiomas, including the management of lesions extending into the third ventricle chamber. Even though indications for this approach are rigorously lesion based, the data confirm its effectiveness in a large patient series.

The endoscopic endonasal approach offers advantages in the management of craniopharyngiomas that historically have been approached via the transsphenoidal approach (i.e., purely intrasellar or intra-suprasellar infradiaphragmatic, preferably cystic lesions in patients with panhypopituitarism).

Use of the extended endoscopic endonasal approach overcomes the limits of the transsphenoidal route to the sella enabling the management of different purely suprasellar and retrosellar cystic/solid craniopharyngiomas, regardless of the sellar size or pituitary function.

They provide acceptable results comparable to those for traditional craniotomies. Endoscopic endonasal surgery is not limited to adults and actually shows higher resection rates in the pediatric population.

**Case series**

see Craniopharyngioma endoscopic endonasal approach case series.

**References**


