Extended endoscopic endonasal approach

- Skull base surgery via extended endoscopic endonasal approach: predictors of ear-nose-throat complications
- A rare case of giant infrasellar craniopharyngioma with extensive invasion of the pterygopalatine fossa: A case report and literature review
- Case report and literature review: endoscopic extended endonasal resection of two cases of giant chondroma
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- Endoscopic Super Extended Endonasal Approach: Transplanum Transtubercullum With Pituitary Hemitransposition and Tailored Transclival Approach for the Resection of a Giant Craniopharyngioma: 2-Dimensional Operative Video
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- Cognitive impairment associated with suprasellar cavernous malformation: A case report and review of the literature
- Multiport combined endoscopic endonasal and transorbital approach to orbital schwannoma

Approaches

Endoscopic transtuberculum transplanum approach.

Endoscopic endonasal transethmoidal transcribriform approach

Indications

With the use of multiple endoscopic endonasal surgical corridors, extended endoscopic endonasal approaches (EEEAs) are now being used to treat a wide range of ventral skull base lesions.

The effectiveness and appropriate use of these techniques must be evaluated by close examination of outcomes as case series expand [1)].

They are highly effective for pituitary neuroendocrine tumors (PA)s invading the cavernous sinus (CS). Postoperative complications rates were relatively low, especially for patients undergoing initial surgery and those with Knosp Grade 3 tumors. Total resection of PAs invading the CS remains challenging, especially in patients undergoing reoperation or having firm tumors [2)].

Extended approaches have expanded the indications for transsphenoidal surgery by using different corridors leading to specific target areas, from the crista galli to the spinomedullary junction.

The extended transsphenoidal approach is a less invasive method for removing purely suprasellar lesions compared with traditional transcranial approaches. Most advocates have used a sublabial incision and a microscope and have reported a significant risk of cerebrospinal fluid (CSF) leakage.

Pérez-Borredá et al describe, step by step, the full EEA expanded to the middle and lower clivus for the treatment of perisellar lesions. Delimiting different modules around the sellar region is useful in establishing the best endoscopic approach for each tumor. A craniopharyngioma (CP) with clival

extension will be used as an illustrative example of the modularity concept of these approaches.

Transsellar-transclival EEA allows complete resection of lesions located in the sellar and infrasellar region with a low rate of complications [3].

The EEEA represents a safe and effective technique for the resection of clival lesions. Despite excellent overall visualization of this region.

Adequate exposure of the most lateral and inferior portions of large tumors is often difficult. Knowledge of these limitations allows determine which tumors are best suited for an EEEA and which may be more appropriate for an open skull base or combined technique [4].

Complications

Postoperative CSF leakage from the large skull base defects has been well described as one of the most common complications.

There are reports of associated formation of delayed subdural hematoma and tension pneumocephalus from approximately 1 week to 3 months postoperatively. However, there have been no reports of immediate complications of high-volume CSF leakage.

Kerr et al., describe two cases in which complications related to rapid, large-volume CSF egress through the skull base surgical defect were detected in the immediate postoperative period [5].

Cerebral aneurysm

in the anatomical laboratory, good visualization and proximal and distal vascular control of the main midline anterior and posterior circulation territory were achieved during the simulation step as well as in the dissection step (anterior communicating complex, internal carotid, ophthalmic, superior hypophyseal, posterior cerebral and posterior communicating, basilar, superior cerebellar, anterior inferior cerebellar, vertebral, and posterior inferior cerebellar arteries).

Some specific anterior and posterior circulation aneurysms can be reached via the nose. For clinical applications of these approaches, some relevant complications, mainly related to the endonasal route, such as proximal and distal vascular control, major arterial bleeding, postoperative cerebrospinal fluid leak, and olfactory disturbances must be considered [6].

Case series

2018

106 patients (57 men and 49 women) underwent surgery for skull base lesions using EEEAs from 2010 to 2017 in the Gulhane Education and Research Hospital, Department of Neurosurgery, Ankara, Turkey.

The EEEA was most commonly used for Giant pituitary neuroendocrine tumors, Sinonasal malignant neoplasms, cerebrospinal fluid (CSF) leaks, meningiomas, craniopharyngiomas, and fibro-osseous lesions. Four different approaches were used including transtuberculum-transplanum, transethmoidal-transcribriform, transclival, and transmaxillary-transpterygoidal.

The overall gross total resection (GTR) rate for these diverse pathologies was 75.0% in 88 patients (excluding the operations performed for non-neoplastic pathologies). GTR was achieved in 100%, 77.8%, 75%, 75%, 72.2%, 62.5%, 60% of fibro-osseous lesions, giant/large pitutary adenomas, meningiomas, esthesioneuroblastomas, sinonasal malignancies, craniopharyngiomas, and chordomas, respectively. The overall rate of improvement in visual fields was 86%. The overall rate of CSF leak was 8.4%. Other surgical complications included intracerebral hematoma and tension pneumocephalus. The mortality rate was 0.9%.

It should be performed with close interdisciplinary collaboration. Appropriate case selection is mandatory. However, despite improved reconstruction techniques, postoperative CSF leakage still remains a challenge [7].

1)
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