Craniopharyngioma transcranial surgery

While transcranial surgery (TCS) for craniopharyngioma resection have been applied for many years, there are ongoing efforts to evaluate and improve these approaches to reduce the rates of significant morbidity. Minimally invasive modifications such as the supraorbital approach, with or without endoscopic assistance, have been used for lesions extending into the third ventricle and with significant retrochiasmatic components [1].

However, the supraorbital approach is limited in its ability to visualize under the ipsilateral optic nerve and into the sella as well as high up into the ventricle. Traditional transcranial approaches are still the mainstay for surgeons unfamiliar with endoscopic skull base surgery.

ESBS facilitates exposure of the tumor without traversing the critical neurovascular structures and has been shown to be associated with decreased morbidity. The ventral approach minimizes optic nerve and brain retraction while exposing not only sellar tumors but also those with suprasellar, third ventricular, and interpeduncular extension. The traditional microscopic approach is limited by a narrow visualized field and the resulting difficulty obtaining a complete resection. The addition of the endoscope has changed the calculus for approaching these tumors ventrally, because wide exposure is afforded through a minimally invasive corridor. Both endoscopic and microscopic ventral approaches remain limited for the removal of tumors with lateral extension beyond the carotid arteries [2].

see Craniopharyngioma endoscopic endonasal approach.

Approaches

Craniopharyngioma surgery approaches

Post-op

1. steroids: these patients are all considered hypo-adrenal. Give hydrocortisone in physiologic doses (for mineralocorticoid activity) in addition to dexamethasone (glucocorticoid that treats edema) taper. Taper steroids slowly to avoid aseptic (chemical) meningitis

2. diabetes insipidus (DI): often shows up early. May be part of a “triphasic response.” Best managed initially with fluid replacement. If necessary, use short acting vasopressin (prevents iatrogenic renal shutdown if a SIADH-like phase develops during vasopressin therapy)

Case reports

In a video, Aldave et al., presented a case of a 6-yr-old girl with a large sellar-suprasellar craniopharyngioma. The fact that the sphenoid was not pneumatized and the chiasm was elevated 1.2 cm from the planum sphenoidal were some of the reasons to choose a subfrontal infrachiasmatic approach as we discuss and we show in the video. This approach has not been very well established

in the literature but we demonstrate it can become a good alternative for a particular type of sellar-suprasellar tumors. Appropriate video authorization consent was obtained from the parent of the patient [3].

1)
Tawk RG, Binning MJ, Thomas JM, Siddiqui AH, Grand W: Transciliary supraorbital approach (eyebrow approach) for resection of retrochiasmatic craniopharyngiomas: an alternative approach, case series, and literature review. J Neurol Surg A Cent Eur Neurosurg 75:354–364, 2014
2)
Schwartz TH, Morgenstern PF, Anand VK. Lessons learned in the evolution of endoscopic skull base surgery. J Neurosurg. 2019 Feb 1;130(2):337-346. doi: 10.3171/2018.10.JNS182154. Review. PubMed PMID: 30717035.
3)
Aldave G, Zinn P, Whitehead WE. Subfrontal Infrachiasmatic Approach to a Craniopharyngioma Resection: 2-Dimensional Operative Video. Oper Neurosurg (Hagerstown). 2019 Feb 5. doi: 10.1093/ons/opy403. [Epub ahead of print] PubMed PMID: 30726971.