Pretemporal transcavernous approach

A retrospective study of 45 patients with non-meningeal tumors involving cavernous sinus. All 45 patients received microsurgical resection via the pretemporal transcavernous approach from April 2012 to January 2019 by the same neurosurgeon. We analyzed clinical manifestations, image data, perioperative complications, surgical outcomes, functional outcomes, and follow-up data of these patients.

Gross total resection was achieved in 38 cases (84.4%) of the 45 patients. Preoperatively, a total of 64 individual cranial nerves were affected. Postoperatively, 92.2% of 64 impaired cranial nerves completely or partially restored function, 7.8% had worsened function compared with their preoperative statuses, and 5 new cranial nerve deficits (CNV) were observed in five patients during the last follow-up. Seven patients presented transient new cranial nerve deficits (5 CNIII and 2 CNVI), three cases suffered transient worsen cranial nerve deficits (3 CNIII and 1 CNVII). There were no cases of intracranial hematoma, intracranial infection, cerebrospinal fluid leaks, and death. The progression of residual tumor was observed in two patients (1 chordoma and 1 pituitary adenoma).

Non-meningeal tumors involving cavernous sinus can be safely and radically removed with less morbidity and mortality. Pretemporal transcavernous approach is an ideal approach to the cavernous sinus and can be tailored individually [1)].

The pretemporal transcavernous approach (PTA) and the endoscopic endonasal transcavernous approach (EETA) are both used to access the retroclival region. Labib et al. compared the technical nuances of, and surgical exposure afforded by, each approach and identified the key elements of the approach selection process.

Fourteen cadaveric specimens underwent either PTA (group A) or EETA with unilateral (group B) followed by bilateral (group C) interdural pituitary gland transposition. The percentage of drilled clivus; length of exposed oculomotor nerve (cranial nerve [CN] III), posterior cerebral artery (PCA), and superior cerebellar artery (SCA); and surgical area of exposure of both cerebral peduncles and the pons for the 3 groups were measured and compared.

Group A had a significantly lower percentage of drilled area than group B (mean [SD], 35.6% [11.2%] vs 91.3% [4.9%], $p < 0.01$). In group C, 100% of the upper third of the clivus was drilled in all specimens. Significantly longer segments of the ipsilateral PCA ($p < 0.01$) and SCA ($p < 0.01$) were exposed in group A than in group B. There was no significant difference in the length of the ipsilateral CN III exposed among the 3 groups. There was also no significant difference between group A and either group B or group C for the contralateral CN III or PCA exposure. However, longer segments of the contralateral SCA were exposed in group C than in group A ($p = 0.02$). Furthermore, longer segments of CN III ($p < 0.01$), PCA ($p < 0.01$), and SCA ($p < 0.01$) were exposed in group C than in group B. For brainstem exposure, there was greater exposure of the pons in group C than in group A (mean [SD], 211.4 [19.5] mm2 vs 157.7 [25.3] mm2, $p < 0.01$) and group B (211.4 [19.5] mm2 vs 153.9 [34.1] mm2, $p < 0.01$). However, significantly greater exposure of the ipsilateral peduncle was observed in group A (mean [SD], 125.6 [43.1] mm2) than in groups B and C (56.3 [6.0] mm2, $p < 0.01$). Group C had significantly greater exposure to the contralateral peduncle than group B ($p = 0.02$).

This study is the first to quantitatively identify the advantages and limitations of the PTA and EETA

from an anatomical perspective. Understanding these data may help the skull base surgeon design a maximally effective yet minimally invasive approach to individual lesions [2].

1)

Huang M, Su J, Xiao Q, Ma Q, Long W, Liu Q. Pretemporal Transcavernous Approach for Resection of Non-meningeal Tumors of the Cavernous Sinus: Single Center Experience. Front Surg. 2022 Feb 17;9:810606. doi: 10.3389/fsurg.2022.810606. PMID: 35252332; PMCID: PMC8891164.

2)

Labib MA, Borba Moreira L, Zhao X, Gandhi S, Cavallo C, Tayebi Meybodi A, Youssef AS, Little AS, Nakaji P, Preul MC, Lawton MT. The side door and front door to the upper retroclival region: a comparative analysis of the open pretemporal and the endoscopic endonasal transcavernous approaches. J Neurosurg. 2019 Nov 8:1-13. doi: 10.3171/2019.6.JNS19964. [Epub ahead of print] PubMed PMID: 31703195.