Endoscopic endonasal transcavernous approach

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 [1].

The endoscopic endonasal transcavernous approach facilitates the removal of prominent posterior clinoids increasing the working space at the lateral recess of the interpeduncular cistern, while preserving the pituitary function [2].

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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.

2)
Fernandez-Miranda JC, Gardner PA, Rastelli MM Jr, Peris-Celda M, Koutourousiou M, Peace D, Snyderman CH, Rhoton AL Jr. Endoscopic endonasal transcavernous posterior clinoidectomy with interdural pituitary transposition. J Neurosurg. 2014 Jul;121(1):91-9. doi: 10.3171/2014.3.JNS131865.

Epub 2014 May 9. PubMed PMID: 24816325.