Endoscopic endonasal transplanum transtuberculum approach

When performing a transplanum transtuberculum approach, dealing with the anterior communicating artery (ACoA) complex is inevitable.

On ten human cadaver heads, dimension of bone opening varied from 88 to 53 mm2. The ACoA was exposed for 3 mm ± 2 mm, A1 for 17 mm ± 9 mm, the distal anterior cerebral artery (A2) for 12 mm ± 3 mm, the recurrent artery of Heubner (RAH) for 16 mm ± 4 mm. Clip placement was possible on the ACoA, A2, and distal segment of A1 in all cases, and on the proximal segment of A1 in one instance. The distance between A1 and the optic chiasm measured 9 mm ± 2 mm.

The ACoA, A2, and the distal segment of A1 can be visualized and controlled through the transplanum transtuberculum approach. The relationship between A1, gyrus rectus, and optic chiasm is the main determinant for the exposure and control of the vessel. The olfactory nerve can represent a surgical landmark for the identification of the A1 origin. The whole course of the RAH can be visualized trough this approach [1)].

Recently, with the evolution of endoscopic techniques, resection of Tuberculum sellae meningioma (TSM) has been achieved using purely endoscopic endonasal transplanum transtuberculum approaches. Although each of these techniques has been successfully described for the treatment of TSM, the question still remains: is it better to access and operate on these lesions via a traditional, transcranial avenue, or are they better treated via endoscopic endonasal techniques? [2)].

The extended endonasal endoscopic surgical route, obtained by removal of the tuberculum sellae and planum sphenoidale, has been used with great success in the surgical management of tumors lying ventral to the optic chiasm, including craniopharyngiomas. It offers a direct midline access to the retrochiasmatic space and provides excellent visualization of the undersurface of the optic chiasm. It also allows extracapsular dissection using binostril-bimanual technique and facilitates complete removal of these formidable tumors. In a report, Sankhla et al. describe step-by-step, the technical details of the endonasal endoscopic transplanum transtuberculum approach with emphasis on the operative nuances for removal of retrochiasmatic craniopharyngiomas [3)].

Completely solid choroid plexus papilloma (CPP) of the third ventricle through an entirely endoscopic, extended transphenoidal approach. Using modern neuroendoscopic methods and closure techniques, a gross total resection was accomplished and a successful closure without postoperative cerebrospinal fluid leak was achieved despite the presence of preoperative hydrocephalus. For appropriately selected lesions, an extended endonasal skull base resection can be performed successfully for vascular tumors despite the presence of preoperative hydrocephalus [4)]

1)
d'Avella E, De Notaris M, Enseñat J, Berenguer J, Gragnaniello C, Mavar M, Ferrer E, Prats-Galino A. The extended endoscopic endonasal transplanum transtuberculum approach to the anterior communicating artery complex: anatomic study. Acta Neurochir (Wien). 2015 Jul 12. [Epub ahead of print] PubMed PMID: 26163258.
2)

Soni RS, Patel SK, Husain Q, Dahodwala MQ, Eloy JA, Liu JK. From above or below: the controversy and historical evolution of tuberculum sellae meningioma resection from open to endoscopic skull base approaches. J Clin Neurosci. 2014 Apr;21(4):559-68. doi: 10.1016/j.jocn.2013.03.043. Epub 2013 Aug 12. PubMed PMID: 24231561.

3)

Sankhla SK, Jayashankar N, Khan GM. Endoscopic endonasal transplanum transtuberculum approach for retrochiasmatic craniopharyngiomas: Operative nuances. Neurol India. 2015 May-Jun;63(3):405-413. doi: 10.4103/0028-3886.158228. PubMed PMID: 26053815.

4)

Kulwin C, Chan D, Ting J, Hattab EM, Cohen-Gadol AA. Endoscopic endonasal transplanum transtuberculum resection of a large solid choroid plexus papilloma of the third ventricle. J Clin Neurosci. 2014 Jul;21(7):1263-6. doi: 10.1016/j.jocn.2013.09.026. Epub 2013 Dec 18. PubMed PMID: 24480582.