Retrochiasmatic craniopharyngioma

Retrochiasmatic craniopharyngiomas are surgically challenging tumors. Retrochiasmatic craniopharyngiomas with complicated conditions such as large diameter, major calcification, or significant extension to the third ventricle or posterior fossa present surgical challenges; moreover, recurrent retrochiasmatic craniopharyngiomas are particularly formidable challenges.

Approaches

Access to the third ventricle can be achieved through the lamina terminalis corridor. A skull base approach to the lamina terminalis can be performed using either an anterolateral approach (orbitozygomatic, pterional, supraorbital) or a midline approach (extended transbasal approach, subfrontal). The major disadvantage of an anterolateral approach is the lack of visualization of the ipsilateral wall of the third ventricle and hypothalamus. However, a midline transbasal approach eliminates this blind spot thereby providing direct visualization of both ependymal walls for safe dissection of the tumor.

In a operative video manuscript, Liu demonstrates an illustrative step-by-step technique for translamina terminalis resection of a retrochiasmatic retroinfundibular craniopharyngioma within the third ventricle via a modified one-piece extended transbasal approach. This approach uses the standard bifrontal craniotomy and incorporates the anterior wall of the frontal sinus as a one-piece flap. The inferior limit of the osteotomy is based along the coronal contour of the anterior skull base which eliminates any bony overhang that can obstruct the line of sight to the lamina terminalis. Additional removal of the supraorbital bar is not necessary. The operative technique for this skull base approach and surgical nuances for craniopharyngioma resection are illustrated in this video atlas.

<html><iframe width="560" height="315" src="https://www.youtube.com/embed/E3Bsp6dUdAE" frameborder="0" allowfullscreen></iframe></html>

The video can be found here: http://youtu.be/E3Bsp6dUdAE. (http://thejns.org/doi/abs/10.3171/2013.V1.FOCUS12354)¹⁾

Although the transpetrosal approach to retrochiasmatic craniopharyngiomas published by Hakuba in 1985 can provide unique advantageous exposure of the retrochiasmatic area to allow safe neurovascular dissection and facilitate radical tumor removal, the procedure is viewed as complicated and time consuming and has a high risk of damaging hearing functions.

A minimum anterior and posterior combined (MAPC) transpetrosal approach, which is a modification of Hakuba's transpetrosal approach, was applied in 16 cases of retrochiasmatic craniopharyngiomas with complicated conditions. Eight cases were recurrent tumors, 4 had previously received radiotherapy, 11 had a large diameter, 10 had large calcification, 15 had superior extension of the tumor into the third ventricle, and 10 had a posterior extension of the tumor that compressed the midbrain and pons. In all 16 patients, more than 2 of these complicated conditions were present. The follow-up duration ranged from 0.8 to 12.5 years (mean 5.3 years). Surgical outcomes assessed were the extent of resection, surgical complications, visual function, endocrinological status, and neuropsychological function. Five-year and 10-year recurrence-free survival rates were also calculated. Results Gross-total or near-total resection was achieved in 15 cases (93.8%). Facial nerve function was completely maintained in all 16 patients. Serviceable hearing was preserved in 15 cases (93.8%). Visual function improved in 13 out of 14 cases (92.9%) that had visual disturbance before surgery. None of the patients experienced deterioration of their visual function. Twelve cases had endocrinological deficit and received hormonal replacement before surgery. New endocrinological deficit occurred in 2 cases (12.5%). Neuropsychological function was maintained in 14 cases (87.5%) and improved in 1 case (6.3%). One case that had received previous conventional radiotherapy treatment showed a gradual decline in neuropsychological function. The 5-year and 10-year recurrence-free survival rates were both 86.5%.

The MAPC transpetrosal approach should be considered as a therapeutic option for selected cases of retrochiasmatic craniopharyngiomas with complicated conditions ²⁾

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Liu JK. Modified one-piece extended transbasal approach for translamina terminalis resection of retrochiasmatic third ventricular craniopharyngioma. Neurosurg Focus. 2013 Jan;34(1 Suppl):Video 1. doi: 10.3171/2013.V1.FOCUS12354. PubMed PMID: 23282153.

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