Lesions ventral to the brainstem in the retrosellar and interpeduncular region are major challenges to the surgeon because of their location at great depth in the centre of the cranial base.

The retrosigmoid approach has been advocated for certain petroclival tumors but provides limited access to any retrosellar extension of tumor, necessitating a two-stage operation.

Surgical approaches to the retrosellar region [1].

The purpose of Kshettry et al. was to demonstrate preliminary feasibility of an endoscopic-assisted technique to provide retrosellar access during the extended retrosigmoid approach and compare microscopic and endoscopic retrosellar working area. Standard retrosigmoid craniectomy and partial petrosectomy respecting inner ear structures were performed on six embalmed cadaveric heads. Two balloons were inflated to simulate a 15 mm petroclival tumor. Retrosellar clival and brainstem working area and ipsilateral oculomotor nerve and posterior cerebral artery (PCA) working distance were measured using the endoscope and microscope. Artificial tumors were implanted and resected using the endoscopic-assisted technique to assess feasibility. The endoscope provided significantly greater mean working area/distance on the clivus (201.6 vs 114.8 mm(2), $p < 0.01$), brainstem (223.5 vs 121.2 mm(2), $p < 0.01$), ipsilateral oculomotor nerve (10.8 vs 6.4 mm, $p < 0.01$), and ipsilateral PCA (13.7 vs 8.9 mm, $p = 0.01$). Petrous dissection to create a 10 × 10 mm working channel and artificial tumor resection was feasible in all dissections. The superior petrosal vein required ligation in 9 (75%) cases. Air cells were exposed in 1 (8%) case. The described endoscopic-assisted technique can provide retrosellar access during the extended retrosigmoid approach to access petroclival tumors with retrosellar extension. Risks include superior petrosal vein sacrifice, bleeding that can impair visualization, injury to the trigeminal nerve during endoscopic insertion/manipulation or injury to the brainstem while working in the medial limits of exposure. Further work is necessary to determine clinical feasibility, safety, and efficacy [2].

Case report

Nakamura and Samii, report the operative management of a patient with a meningioma in an unusual location, extending from the upper clivus, retrosellar and interpeduncular region into the suprasellar area up to the level of the foramen of Monro. A 41-year-old man presented with a 3-month history of progressive visual disturbance, episodic headache and signs and symptoms of endocrinological disturbance. Magnetic resonance imaging (MRI) studies showed a homogeneously enhancing tumour ventral to the brainstem with large cranio-caudal extension from the upper clivus to the suprasellar area. Operative removal was planned in two stages. First, through a right lateral suboccipital retrosigmoid craniectomy the caudal portion of the tumour at the upper clivus and prepontine region was removed. Second, the residual suprasellar part of the tumour was removed totally through a fronto-lateral craniotomy on the right side one week later. When a tumour is very large or involves different areas of the skull base, it is necessary to decide between removal in one stage, which requires a complex and time consuming skull base approach, or in multiple stages. Our case demonstrates how a retrosellar meningioma extending to the suprasellar region can be totally removed using two simple skull base approaches without the risk of compromise to venous drainage and without the need for extensive bone removal as described in other skull base approaches [3]

1)
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2)
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analysis of retrosellar working area. Neurosurg Rev. 2014 Apr;37(2):243-51; discussion 251-2. doi: 10.1007/s10143-013-0514-6. Epub 2013 Dec 18. PubMed PMID: 24346377.

3) Nakamura M, Samii M. Surgical management of a meningioma in the retrosellar region. Acta Neurochir (Wien). 2003 Mar;145(3):215-9; discussion 219-20. PubMed PMID: 12632118.