

Extended anterior petrosectomy

Petroclival tumors and ventrolateral lesions of the pons present unique surgical challenges. A cadaveric study provides a qualitative and quantitative anatomic comparison for an anterior petrous apicectomy through the transcranial middle fossa (TMF) and expanded endoscopic transsphenoidal-transclival (EETT) approaches.

In 10 silicone-injected heads, the petrous apex and clivus were drilled extradurally using middle fossa and endonasal approaches. With in situ and frameless stereotactic navigation, they defined consistent points to compare working areas, bone removal volumes, approach angles, and surgical freedom.

Mean exposed TMF area ($21.03 \pm 3.46 \text{ cm}^2$) achieved a $44.71 \pm 4.13^\circ$ working angle to the brainstem between cranial nerves (CNs) V and VI. Kawase's rhomboid area measured $1.76 \pm 0.34 \text{ cm}^2$ and bone removal averaged $1.20 \pm 0.12 \text{ cm}^3$ at the petrous apex. Surgical freedom on the lateral brainstem was higher halfway between CNs V and VI at the center of the rhomboid compared to midline at the basilar sulcus ($P < 0.01$). After clivectomy and petrous apicectomy, mean exposed EETT area was $5.29 \pm 0.66 \text{ cm}^2$. Approach from either nostril showed no statistically significant differences in surgical freedom at the foramen lacerum and midpoint basilar sulcus. At the petrous apex, bone volume removed and area exposed were significantly larger for TMF approach ($P < 0.001$).

Expanded transclival anterior petrosectomy through the TMF approach provides an adequate corridor to lesions in the upper ventro-lateral pons. The EETT approach better fits midline lesions not extending laterally beyond CN VI and C3 carotid when evaluating normal anatomical parameters ¹⁾.

Unclassified

2: Rao RM, Shrivastava A, Nair S. Anterior Transpetrosal Approach for Petroclival Meningioma: Operative Nuances. *Neurol India*. 2020 Jan-Feb;68(1):20-25. doi: 10.4103/0028-3886.279689. PubMed PMID: 32129238.

3: O'Connor KP, Pelargos PE, Palejwala AH, Shi H, Villeneuve L, Glenn CA. Resection of Pediatric Trigeminal Schwannoma Using Minimally Invasive Approach: Case Report, Literature Review, and Operative Video. *World Neurosurg*. 2019 Jul;127:518-524. doi: 10.1016/j.wneu.2019.04.113. Epub 2019 Apr 19. Review. PubMed PMID: 31009782.

4: Gosal JS, Behari S, Joseph J, Jaiswal AK, Sardhara JC, Iqbal M, Mehrotra A, Srivastava AK. Surgical excision of large-to-giant petroclival meningiomas focusing on the middle fossa approaches: The lessons learnt. *Neurol India*. 2018 Sep-Oct;66(5):1434-1446. doi: 10.4103/0028-3886.241354. PubMed PMID: 30233019.

5: Rennert RC, Hoshida R, Calayag M, Kemp J, Gonda DD, Meltzer HS, Fukushima T, Day JD, Levy ML. Extended middle fossa approach to lateralized pontine cavernomas in children. *J Neurosurg Pediatr*. 2018 Apr;21(4):384-388. doi: 10.3171/2017.10.PEDS17381. Epub 2018 Feb 2. PubMed PMID: 29393814.

6: Di Somma A, Andaluz N, Cavallo LM, Topczewski TE, Frio F, Gerardi RM, Pineda J, Solari D, Enseñat J, Prats-Galino A, Cappabianca P. Endoscopic transorbital route to the petrous apex: a feasibility anatomic study. *Acta Neurochir (Wien)*. 2018 Apr;160(4):707-720. doi: 10.1007/s00701-017-3448-x.

Epub 2017 Dec 29. PubMed PMID: 29288394.

7: Liu JK. Extended middle fossa approach with anterior petrosectomy for resection of upper petroclival meningioma involving Meckel's cave: operative video and technical nuances. *Neurosurg Focus*. 2017 Oct;43(VideoSuppl2):V8. doi: 10.3171/2017.10.FocusVid.17345. PubMed PMID: 28967313.

8: d'Avella E, Angileri F, de Notaris M, Enseñat J, Stagno V, Cavallo LM, Gonzales JB, Weiss A, Prats-Galino A. Extended endoscopic endonasal transclival approach to the ventrolateral brainstem and related cisternal spaces: anatomical study. *Neurosurg Rev*. 2014 Apr;37(2):253-60; discussion 260. doi: 10.1007/s10143-014-0526-x. Epub 2014 Feb 5. PubMed PMID: 24497268.

9: Grossi PM, Nonaka Y, Watanabe K, Fukushima T. The history of the combined supra- and infratentorial approach to the petroclival region. *Neurosurg Focus*. 2012 Aug;33(2):E8. doi: 10.3171/2012.6.FOCUS12141. PubMed PMID: 22853839.

10: Russo VM, Graziano F, Russo A, Albanese E, Ulm AJ. High anterior cervical approach to the clivus and foramen magnum: a microsurgical anatomy study. *Neurosurgery*. 2011 Sep;69(1 Suppl Operative):ons103-14; discussion ons115-6. doi: 10.1227/NEU.0b013e31821664a6. PubMed PMID: 21415787.

11: Chung JC, Chung SY, Kim SM, Park MS. Surgery for a case of three-compartment trigeminal schwannoma : technical aspects. *J Korean Neurosurg Soc*. 2010 Oct;48(4):383-7. doi: 10.3340/jkns.2010.48.4.383. Epub 2010 Oct 30. PubMed PMID: 21113372; PubMed Central PMCID: PMC2982923.

12: Scholz M, Parvin R, Thissen J, Löhnert C, Harders A, Blaeser K. Skull base approaches in neurosurgery. *Head Neck Oncol*. 2010 Jul 5;2:16. doi: 10.1186/1758-3284-2-16. Review. PubMed PMID: 20602753; PubMed Central PMCID: PMC2913918.

13: Zhao JC, Liu JK. Transzygomatic extended middle fossa approach for upper petroclival skull base lesions. *Neurosurg Focus*. 2008;25(6):E5; discussion E5. doi: 10.3171/FOC.2008.25.12.E5. PubMed PMID: 19128050.

14: Steiger HJ, Hänggi D, Stummer W, Winkler PA. Custom-tailored transdural anterior transpetrosal approach to ventral pons and retroclival regions. *J Neurosurg*. 2006 Jan;104(1):38-46. PubMed PMID: 16509145.

15: Villavicencio AT, Leveque JC, Bulsara KR, Friedman AH, Gray L. Three-dimensional computed tomographic cranial base measurements for improvement of surgical approaches to the petrous carotid artery and apex regions. *Neurosurgery*. 2001 Aug;49(2):342-52; discussion 352-3. PubMed PMID: 11504110.

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Hasanbelliu A, Andaluz N, Di Somma A, Keller JT, Zimmer LA, Samy RN, Pensak ML, Zuccarello M. Extended anterior petrosectomy through the transcranial middle fossa approach and extended endoscopic transphenoidal-transclival approaches: qualitative and quantitative anatomic analysis. *World Neurosurg*. 2020 Mar 4. pii: S1878-8750(20)30402-2. doi: 10.1016/j.wneu.2020.02.127. [Epub ahead of print] PubMed PMID: 32145421.

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