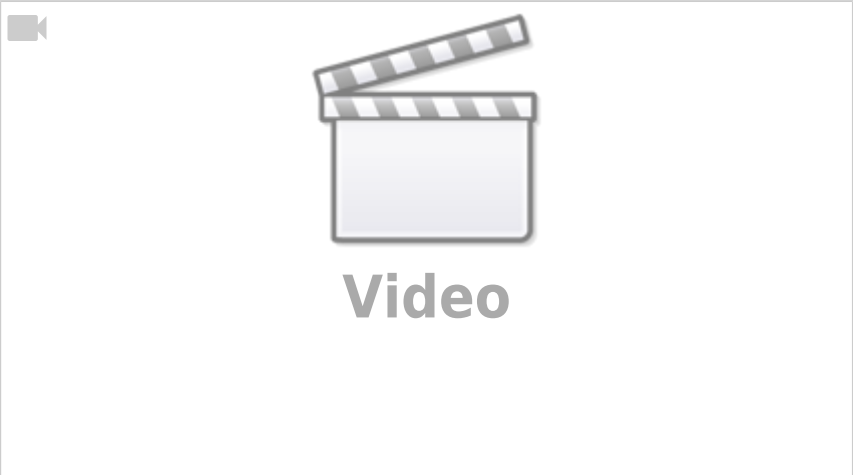
Retrosigmoid transmeatal approach for vestibular schwannoma videos



Dorsal displacement of the facial nerve is relatively rare in patients with vestibular schwannoma. Its prediction remains difficult in patients with large tumors, even with the recent advances in preoperative radiologic assessments. Anatomic and functional preservation of the facial nerves combined with maximal tumor removal is particularly challenging in this rare anatomic variant, and surgery may lead to postoperative facial nerve paralysis, inadequate tumor removal, and/or a high retreatment rate.

The 3-dimensional video (Video 1) demonstrates a vestibular schwannoma with dorsally displaced facial nerve, which was surgically treated by the retrosigmoid transmeatal approach under continuous facial nerve monitoring. The video was reproduced after informed consent of the patient. A 46-year-old man presented with transient hearing impairment. Neuroimaging displayed a left vestibular schwannoma extending into the internal acoustic meatus. The retrosigmoid transmeatal approach was performed, and a dorsally displaced facial nerve was predicted by preoperative magnetic resonance images and confirmed during surgery. The facial nerve was accurately dissected under continuous facial nerve monitoring, and gross total resection of the tumor was achieved without postoperative facial dysfunction [1)].

A case of a mid-sized vestibular schwannoma (T3b according to the Hannover Grading Scale) that was resected through a Endoscopic assisted retrosigmoid approach in semisitting position

A 52-year-old male with acute loss of functional hearing on the right side. Audiometry confirmed a loss of up to 60 dB and lost speech discrimination, there were no associated symptoms such as tinnitus or vertigo. This 2D video demonstrates positioning, OR set-up, anatomical and surgical nuances of the skull base approach and the operative technique for microdissection of the tumor from the critical neurovascular structures, especially the facial and cochlear nerves. A gross total resection was achieved and the patient discharged home after four days with unaltered function of the facial nerve (HB I). At one year follow up there was no indication of residual or recurrence. In summary, the retrosigmoid transmeatal approach is an important and powerful tool in the armamentarium for the microsurgical management of all kinds of vestibular schwannomas. Provided the necessary anesthesiological precautions and intraoperative procedures the semi-sitting position is safe and effective. If needed, the approach can be complemented by the use of an endoscope for visualization

of the distal internal auditory canal. The link to the video can be found at: https://youtu.be/pPKT4_5nIn0 [2].

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The anterior inferior cerebellar artery (AICA) usually runs loosely within the cerebellopontine cistern; in rare cases, however, it is firmly adherent to the petrous dura mater. Recognizing this variation is particularly important in vestibular schwannoma surgery via the retrosigmoid transmeatal approach to prevent the high morbidity associated with vascular injury. This video demonstrates a surgical technique to effectively mobilize the AICA when firmly adherent to the petrous dura mater.

A 39-year-old man presented with a history of progressive right-sided hearing loss without facial weakness or other associated symptoms. Magnetic resonance imaging (MRI) demonstrated an intracanalicular lesion, suggestive of vestibular schwannoma. During follow-up, audiometry confirmed a further slight deterioration of hearing and repeated MRI demonstrated tumor growth (T2 according to Hannover Grading Scale). Since the patient opted against radiosurgery, a retrosigmoid transmeatal approach under continuous intraoperative monitoring was performed in supine position. Following drainage of cerebrospinal fluid and exposure of the cerebellopontine cistern, the AICA was found to be firmly adherent to the petrous dura mater. Both structures were elevated conjointly and displaced medially for safe drilling of the inner auditory canal, sufficient exposure, and complete excision of the vestibular schwannoma. The patient had an excellent recovery, hearing and facial function were preserved, and no secondary neurological deficits noted.The patient consented to publication of this anonymized video [3].

Skull Base Neurosurgery - University of Colorado

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References

1)
Matsushima K, Kohno M, Nakajima N, Ichimasu N. Dorsally Displaced Facial Nerve in Retrosigmoid Transmeatal Approach for Vestibular Schwannoma: 3-Dimensional Operative Video. World Neurosurg. 2019 Mar;123:300. doi: 10.1016/j.wneu.2018.11.261. Epub 2018 Dec 21. PubMed PMID: 30580063.
2)
Evangelista-Zamora R, Lieber S, Ebner FH, Tatagiba M. Retrosigmoid Transmeatal Endoscope-Assisted Approach in Semi-Sitting Position for Resection of Vestibular Schwannoma: 2-D operative Video. J Neurol Surg B Skull Base. 2018 Dec;79(Suppl 5):S385-S386. doi: 10.1055/s-0038-1669985. Epub 2018 Oct 9. PubMed PMID: 30473983; PubMed Central PMCID: PMC6240135.
3)
Tatagiba MS, Evangelista-Zamora R, Lieber S. Mobilization of the Anterior Inferior Cerebellar Artery When Firmly Adherent to the Petrous Dura Mater-A Technical Nuance in Retromastoid Transmeatal Vestibular Schwannoma Surgery: 3-Dimensional Operative Video. Oper Neurosurg (Hagerstown). 2018 Nov 1;15(5):E58-E59. doi: 10.1093/ons/opy052. PubMed PMID: 29617908.