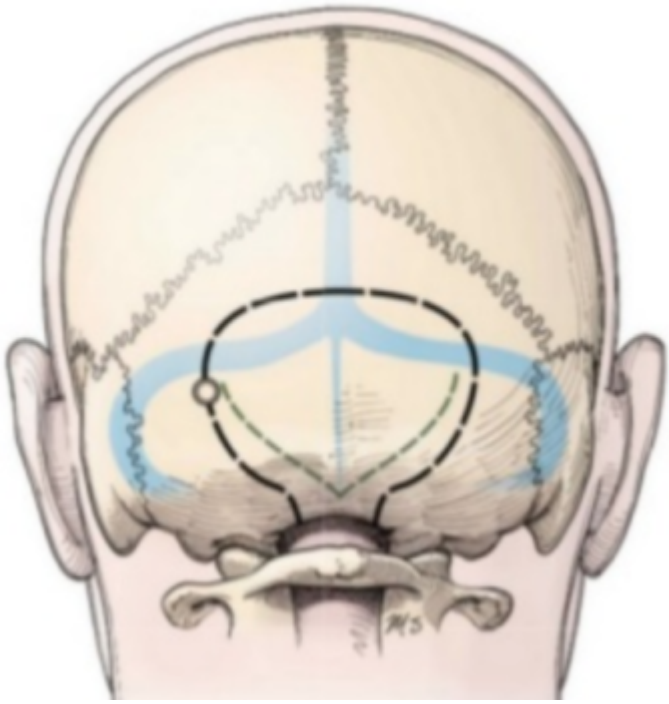
Torcular craniotomy



Vermian Arteriovenous Malformations are located in the midline and exposed with a torcular craniotomy to gain access to both the suboccipital and tentorial surfaces. The suboccipital part of the - vermis (tuber, pyramid, uvula, and nodule) is superficial and easily accessed, but the tentorial part (culmen, declive and folium) is deep and requires subarachnoid dissection to open the supracerebellar-infratentorial plane. The ascending slope of the tentorial part of the vermis requires significant neck flexion when positioning the head, tucking the chin two finger breadths from the manubrium in the prone position to align the tentorium vertically. Alternatively, small AVMs at the apex of the vermis or anteriorly in the quadrigeminal cistern can be approached with the patient in the sitting position, which allows gravity to retract the cerebellum and open the supracerebellar-infratentorial plane. Vermian AVMs attract bilateral feeding arteries, with superior vermian AVMs supplied by superior cerebellar artery SCAs and inferior vermian AVMs supplied by PICAs.

Superior vermian AVMs are much more common than inferior vermian AVMs (90% and 10%, respectively). Surgical exposure is perpendicular with inferior vermian AVMs but tangential with superior vermian AVMs, requiring some transgression of the posterior vermis to access the inferior margins. The SCA feeders are identified by incising the posterior arachnoid of the quadrigeminal cistern on both sides of the vermian apex and opening the cerebellomesencephalic fissure where the cortical branches (s4 segments) emerge. Feeders are traced to the AVM margin and coagulated, carefully preserving arteries to the tectum and posterior midbrain. PICA feeders originate beyond its cranial loop along the distal telovelotonsillar (p4) and cortical (p5) segments. Venous drainage is through superior vermian veins, which drain to the Galenic complex (unlike inferior vermian veins). Vermian AVMs are not considered eloquent unless they extend to the cerebellar nuclei, and can be near but not associated with the trochlear nerve [1)] [2)].

1)

Rodríguez-Hernández A, Kim H, Pourmohamad T, Young WL, Lawton MT. University of California, San Francisco Arteriovenous Malformation Study Project. Cerebellar arteriovenous malformations: Anatomic subtypes, surgical results, and increased predictive accuracy of the supplementary grading

system. Neurosurgery. 2012 Dec;71(6):1111–1124.
2)

Rodríguez-Hernández A, Rhoton AL Jr, Lawton MT. Segmental anatomy of cerebellar arteries: a proposed nomenclature. Laboratory investigation. J Neurosurg. 2011 Aug;115(2):387-97. doi: 10.3171/2011.3.JNS101413. Epub 2011 May 6. PubMed PMID: 21548748.