Sylvian fissure dissection

- Revisiting sylvian fissure dissection - A preliminary investigation into surgical process modelling for evaluating surgical proficiency
- Surgical management and visual outcomes of optic-pathway cavernous malformations: A comprehensive literature review of 80 reported cases (1979 - 2025)
- Transorbital Transsylvian Selective Amygdalohippocampectomy: A Feasibility Anatomic Investigation
- Transplanum polare approach to the anterior mesiotemporal region
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- Keyhole Mini-Pterional Craniotomy for Clipping of Bilateral Middle Cerebral Artery Aneurysms
- How I do it - focused Sylvian approach for clipping of middle cerebral artery aneurysms
- Microsurgical Clipping of Blood Blister-like Anterior Communicating Artery Aneurysm in a Patient with Total Occlusion of Left Internal Carotid Artery Aneurysm

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Sylvian fissure dissection provides a narrow corridor for resection of most insular tumors. In addition, MCA branches often tether the frontal lobe to the temporal lobe, limiting elevation of the frontal lobe and undermining of its operculum to remove tumor underneath [1].

This technique is one of the most important principles in microsurgery.

Dissection of the fissure starts with opening of the thick arachnoid bands along the superior aspect of the fissure.

Generous arachnoidal dissection provides adequate intercisternal pathways to find vascular pathology within the fissure. And at the same time minimizes the use of forceful retraction to immobilize the frontal and temporal lobes. An ample amount of time is spent to sharply dissect the arachnoid bands while minimizing peel injury.

A wide sylvian fissure opening, with either a proximal or distal start, has been standard for microsurgical management of middle cerebral artery (MCA) aneurysms. However, extensive sylvian dissection is potentially associated with increased incidence of iatrogenic injury to the brain and neurovascular structures.

The focused sylvian opening is a less-invasive alternative to the classical wide sylvian opening for the microsurgical management of most MCA aneurysms [2].

Arachnoid dissection is often challenging because of tight corridors, microvasculature crossing the membranes, and a narrow operative field. It is often said that “splitting” the sylvian fissure measures the talent of a cerebrovascular neurosurgeon, and there are as many styles of sylvian fissure dissection as neurosurgical schools. Benet et al. principle is to dissect the subarachnoid space sharply

and with minimal trauma to neither the microvasculature nor the pia mater. They developed a technique that allows efficient and safe sharp dissection through the subarachnoid space: the "microcisternal drainage" technique. This technique (Video 1) involves applying a pledget to a narrow cistern and suctioning the cerebrospinal fluid while maintaining uplifting retraction with the suction shaft. Clear trabeculae are dissected sharply to release microvessels at the convexity of their turns. This technique is especially advantageous when cisterns are narrow (e.g., pia-to-pia) or highly formal structures are at risk. The main advantages over conventional cisternal dissection are avoidance of refractive effect, enhanced identification of the microvasculature from the trabeculae, and preservation of pia matter. Using the microcisternal drainage technique, the microvasculature, arachnoid membranes, and pia reveal themselves, and we avoid the cerebrospinal fluid-related refractive effect, maximizing depth perception. They report an example of the "microcisternal drainage" technique to split the sylvian fissure during the treatment of an irregular middle cerebral artery bifurcation aneurysm on a 56-year-old woman. The patient tolerated the procedure well, was discharged without neurologic deficits, and resumed everyday life with no aneurysm remnant [3].

Videos

https://www.neurosurgicalatlas.com/volumes/cerebrovascular-surgery/aneurysms/techniques-of-sylvian-fissure-split

1)
Rey-Dios R, Cohen-Gadol AA. Technical nuances for surgery of insular gliomas: lessons learned. Neurosurg Focus. 2013 Feb;34(2):E6. doi: 10.3171/2012.12.FOCUS12342. Review. PubMed PMID: 23373451.

2)
Elsharkawy A, Niemelä M, Lehečka M, Lehto H, Jahromi BR, Goehre F, Kivisaari R, Hernesniemi J. Focused opening of the sylvian fissure for microsurgical management of MCA aneurysms. Acta Neurochir (Wien). 2014 Jan;156(1):17-25. doi: 10.1007/s00701-013-1894-7. Epub 2013 Oct 8. PubMed PMID: 24101289.

3)
Benet A, Yoshikawa K, Noda K, Tanikawa R. "Microcisternal Drainage" Technique for Clipping a Middle Cerebral Artery Aneurysm. World Neurosurg. 2023 Jan 26;172:34. doi: 10.1016/j.wneu.2023.01.074. Epub ahead of print. PMID: 36708990.