Quadrigeminal cistern arachnoid cyst

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Quadrigeminal cistern arachnoid cysts occur between the collicular plates and the incisura notch of the tentorium. The symptomatology of quadrigeminal arachnoid cysts varies according to their size and depends on the severity of the compression on the tectal plate, brain stem, cerebellum, and aqueduct. [1)].

Management options for the treatment of quadrigeminal arachnoid cysts (QAC) include microsurgical/endoscopic fenestration or shunt. There is an open debate about which method is the best. Microsurgical fenestration is well suited for the treatment of QAC with predominant infratentorial components and without hydrocephalus making endoscopic procedures more challenging.

Campagnaro et al. describe the microsurgical technique and related anatomy to fenestrate infratentorial QAC through the supracerebellar infratentorial approach. We also discuss our experiences with this approach, and some of the drawbacks and nuances.

Navigation-guided microsurgical fenestration of infratentorial QAC is the authors' surgical approach of choice for treating these rare challenging lesions when not associated with hydrocephalus [2)]

A case of type I quadrigeminal cistern AC managed via navigation-guided cystoventriculostomy followed by endoscopic third ventriculostomy (Video 1). A 0° rod-lens endoscope was used. Different types of cysts may require different endoscopic approaches, and our procedure was facilitated by the presence of significant ventriculomegaly.1 The endoscopic procedure was completed uneventfully; navigation was used to limit ventricular exploration and find the thinnest point for cystoventriculostomy. A bipolar without cautery may be used for fenestration in both cyst and third ventricle floor, which is ultimately expanded with a Fogarty balloon. This increases the eventual size of the cystoventriculostomy and hence the long-term patency rate.2,3 Another marker of the success of the fenestration is the presence of a cerebrospinal fluid flow void on postoperative magnetic resonance imaging,3 both of which are demonstrated in the video. The cyst collapsed during follow-up after the endoscopic procedure with a reduction in hydrocephalus and opening up of the aqueduct. The patient's headache disappeared, visual symptoms showed remarkable improvement. Quadrigeminal cistern AC is one type of pineal region AC, and it is advisable to plan the operative approach before the endoscopic procedure according to the different types of pineal region ACs.

Pineal region ACs and associated hydrocephalus can be successfully treated with simple, minimally invasive endoscopic procedures. Navigation assistance may not be necessary in all cases, but it allows for safe, rapid location of the fenestration site. A minimally invasive route and attention to smaller nuances of anatomy are key to safe management of these benign conditions [3].

1)
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2)
Campagnaro L, Bonaudo C, Capelli F, Della Puppa A. Microscope neuronavigation-guided microsurgical fenestration of quadrigeminal cistern arachnoid cysts: how I do it. Acta Neurochir (Wien). 2023 Feb 27. doi: 10.1007/s00701-023-05531-8. Epub ahead of print. PMID: 36849831.
3)
Deora H. Endoscopic Management of Quadrigeminal Arachnoid Cyst with Neuronavigation Guidance. World Neurosurg. 2022 May;161:135. doi: 10.1016/j.wneu.2022.02.099. Epub 2022 Mar 4. PMID: 35248767.