Chiasmatic cistern

The chiasmatic cistern is a cerebrospinal fluid-filled space located at the base of the brain, just above the pituitary gland. It is formed by the arachnoid membrane, one of the three membranes that cover and protect the brain and spinal cord.

The chiasmatic cistern is an important anatomical structure because it surrounds the optic chiasm, a cross-shaped structure where the optic nerves from both eyes cross over. The optic chiasm is located at the base of the brain, just in front of the pituitary gland.

The chiasmatic cistern is clinically significant because it can become enlarged due to certain medical conditions, such as a pituitary adenoma (a tumor of the pituitary gland) or a cerebral aneurysm (a bulging or weakened area in a blood vessel in the brain). This enlargement can lead to compression of the optic chiasm and the surrounding structures, resulting in visual disturbances, hormonal imbalances, and other neurological symptoms.

Imaging techniques such as magnetic resonance imaging (MRI) are often used to visualize the chiasmatic cistern and detect any abnormalities that may be present.

In front, the interpeduncular cistern extends forward across the optic chiasma, forming the cistern of chiasma, chiasmatic cistern, or suprasellar cistern and on to the upper surface of the corpus callosum, for the arachnoid stretches across from one cerebral hemisphere to the other immediately beneath the free border of the falx cerebri, and thus leaves a space in which the anterior cerebral arteries are contained. The "leaf" or extension of the chiasmatic cistern above the chiasma, which is separated from the optic recess of the third ventricle by the thin lamina terminalis, has been called the suprachiasmatic cistern. As spaces filled with freely circulating cerebrospinal fluid, cisterns receive



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little direct study, but are mentioned in pathological conditions. Cysts and tumors of the lamina terminalis extend into the suprachiasmatic cistern, as can pituitary tumors, or the cistern can be partially or completely effaced by injury and hematoma or by blockage of the cerebral aqueduct.

Jinsheng et al. studied the arachnoid of the chiasmatic cistern (CC) and the methods for increasing the exposure of the CC from an endoscopic perspective. Eight anatomical specimens with vascular injection were used for endoscopic endonasal dissection. The anatomical characteristics of the CC were studied and documented, and anatomical measurements were collected. The CC is an unpaired five-walled arachnoid cistern located between the optic nerve, optic chiasm, and the diaphragma sellae. The average exposed area of the CC before the anterior intercavernous sinus (AICS) was transected was $66.67 \pm 33.76 \text{ mm2}$. After the AICS was transected and the pituitary gland (PG) was mobilized, the average exposed area of the CC was $95.90 \pm 45.48 \text{ mm2}$. The CC has five walls and a complex neurovascular structure. It is located in a critical anatomical position. The transection of the AICS and mobilization of the PG or the selective sacrifice of the descending branch of the superior hypophyseal artery can improve the operative field ¹⁾.

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Jinsheng Q, Wenlong T, Wenchao L, Hui X, Changrui S, Qingguo L, Long W. Extended endoscopic endonasal approach to the chiasmatic cistern: An anatomical study of the arachnoid. Clin Anat. 2023 May 5. doi: 10.1002/ca.24052. Epub ahead of print. PMID: 37144299.

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