An Unusual Case of Arachnoid Cyst
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Abstract
Arachnoid cysts are benign, congenital, space-occupying lesions that are filled with CSF (Cerebrospinal fluid). We report an unusual case of a multi-compartmental arachnoid cyst of 26 years old male who complained of gradually increasing headache. Computed tomography and magnetic resonance imaging revealed a large arachnoid cyst involving the left middle and anterior cranial fossae with sub-falcine extension into the right anterior cranial fossa.

Keywords: Arachnoid cyst; Computed tomography; Magnetic resonance imaging

Case Report
A 26-year-old male presented to the Emergency Department complaining of a gradually worsening headache and recent history of trauma. On noncontrast Computed Tomography examination of the head performed in an outside hospital, the patient was diagnosed with an intracranial neoplasm and was referred to our institution for further assessment.

Magnetic Resonance Imaging of the brain showed a large, extraaxial, well-defined multicompartmental lesion involving the left middle and anterior cranial fossae with sub-falcine extension into the right anterior cranial fossa. The lesion follows CSF signal intensity on all sequences, demonstrating T1 hypointensity (Figure 1a) and T2 hyperintensity (Figure 1b), suppression of signal on Fluid Attenuated Inversion Recovery (FLAIR) (Figure 1c) sequences and facilitation of diffusion on DWI sequences (Figure 1d). It displaces the overlying brain parenchyma superiolaterally and results in effacement of the frontal horn of the left lateral ventricle with no hydrocephalous (Figures 1b and 2). It does not communicate with the ventricular system. It results in mild mass effect on the circle of Willis, the left middle cerebral artery and bilateral anterior cerebral arteries as well as on the pituitary stalk. The Computed Tomography demonstrates characteristic bony Scalloping and remodeling of the inner table of the adjacent calvarium, indicating the slow growth of the lesion. The left frontal sinus is much larger than the right frontal sinus, which is also unusual (Figure 3).

Figure 1a: Sagittal T1-weighted MR image shows low-signal-intensity lesion.
Figure 1b: Coronal T2-weighted MR image shows high-signal-intensity lesion in left middle and anterior cranial fossae with sub-falcine extension into the right anterior cranial fossa.
Figure 1c: Transverse FLAIR MR image shows complete suppression.
Figure 1d: Transverse diffusion-weighted MR image shows no restriction.

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Cysts occur in the middle cranial fossa and larger lesions are often meninx primitiva in early embryogenesis. More than 50% of arachnoid are congenital lesions, probably arising due to maldevelopment of the system. The cysts tend to be unilocular, smoothly marginated expansile that are filled with CSF. They do not communicate with the ventricular sinus.

The precise mechanism for the formation of arachnoid cysts is not known. It is possible that they are secondary to "splitting" or a diverticulum of the developing arachnoid. The cause has also been attributed to trauma, mastoiditis, meningitis, and subarachnoid hemorrhage [2-7]. Arachnoid cysts are generally stable over time, although cases of sudden or progressive enlargement, as well as spontaneous resolution, have been reported [8,9].

The best diagnostic clue is a sharply demarcated extra axial cyst that can displace or deform adjacent brain. Scallop ing of the adjacent calvarium is often seen. The classic arachnoid cyst has no identifiable internal architecture and does not enhance. The cyst typically has the same signal intensity as CSF at all sequences. Occasionally, however, hemorrhage, high protein content, or lack of flow within the cyst may complicate the MR appearance [2-5]. Hemorrhage may occur not only in the cyst but also in the subdural or extradural spaces. Arachnoid cysts have an increased prevalence of coexisting subdural hematomas, especially when they occur in the middle cranial fossa [10,11].

Regarding the differential Diagnosis, the most difficult lesion to distinguish from the arachnoid cyst is an epidermoid cyst. Chronic subdural hematoma and porencephalic cyst can also be confused for an arachnoid cyst [12].

Teaching Point

Being a multicompartmental lesion does not necessarily indicate malignancy.

References
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