East African Scholars Journal of Medicine and Surgery
Abbreviated Key Title: EAS J Med Surg
ISSN: 2663-1857 (Print) & ISSN: 2663-7332 (Online)
Published By East African Scholars Publisher, Kenya

OPEN ACCESS

Volume-7 | Issue-8 | Aug-2025 | DOI: https://doi.org/10.36349/easjms.2025.v07i08.001

Case Report

Arachnoid Cyst of the Middle Fossa: A Case Report and Littérature

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Article History
Received: 29.05.2025
Accepted: 08.07.2025
Published: 02.08.2025

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: Arachnoid cysts are benign lesions that are filled with cerebrospinal fluid (CSF). These lesions usually develop gradually and asymptomatic, however they can sometimes become symptomatic due to cyst expansion or intracystic hemorrhage. The current article explores a rare case of an arachnoid cysts of the middle fossa in a 36-year old male. The patient has been pleasing for 8 months an intracranial hypertension SD made of moderate headaches (VAS 6/10) associated with a bilateral blurred vision, complicated 4 months later by vomiting at the rate of one episode per day. The purpose of this study is to highlight the rarity of arachnoid cysts in the posterior cranial fossa and to elucidate the radiological similarities among hydatid cysts, pilocytic astrocytomas, and arachnoid cysts.

Keywords: Arachnoid cyst (AC), Pilocytic astrocytoma (PCA), Hydatid cyst (HC), posterior cerebral fossa, cerebrospinal fluid (CSF), cerebellar syndrome.

INTRODUCTION

Arachnoid cysts (ACs) are benign collections of cerebrospinal fluid (CSF) within an abnormal duplication of the arachnoid membranes during brain development [1]. They constitute approximately 1%-2% of intracranial mass lesions, with the middle cranial fossa being their most prevalent site. However, approximately 10% of ACs are discovered in the posterior cranial fossa [2]. In this location, the absence of connection with both the surrounding arachnoid spaces and the ventricles, as well as normal hindbrain development, permits distinction from other cystic malformations such as Dandy-Walker malformation, Blake's pouch cyst, and mega cisterna magna [3].

Arachnoid cysts can manifest clinically in a variety of ways, depending on the location, size, and age of the cystemic individual [4]. Imaging modalities like computed tomography (CT) or magnetic resonance imaging (MRI) are commonly used to diagnose these cysts.

CASE REPORT

A 36 year-old male presented with a history of moderate headaches referred as worse in the evening (VAS 6) and bilateral vision loss since 8 months aggravated by vomiting at a frequency of one episode per day and balance and walking disorders 4 months later.

The neurological examination revealed solely a cerebellar syndrome, devoid of any involvement of the cranial pairs.

These symptoms warranted further investigation. An imaging study was conducted at the university hospital's emergency department, revealing a mass occupying the posterior cerebral fossa with a passive upstream triventricular hydrocephalus and a ptosis of the cerebellar tonsils by compressive effect. [Figure 1] Subsequently, an ophthalmological examination was performed, indicating

reduced visual acuity in both eyes (4/10 in the right eye and 1/10 in the left eye) and advanced papillary edema (stage 3) bilaterally.

Given the patient's clinical and radiological findings, we admitted him to the neurosurgery department for appropriate management.

Various differential diagnoses have been suggested based on the radiological findings, including pilocytic astrocytoma, hydatid cyst, and arachnoid cyst.

Consequently, surgical excision of the posterior cerebral fossa mass was planned to obtain a definitive diagnosis and provide appropriate therapeutic intervention.

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Under general anaesthesia, the patient underwent surgical tumor removal. Following a craniectomy, the cyst was punctured, revealing a clear, water-like fluid. Subsequently, the dura mater was opened, resulting in the rupture of the cyst during the operation. The cyst membrane was then carefully dissected and sent for histopathological examination, which confirmed the diagnosis of

an arachnoid cyst. The postoperative course was uneventful with a regression of the intracranial hypertension and cerebellar syndrome.

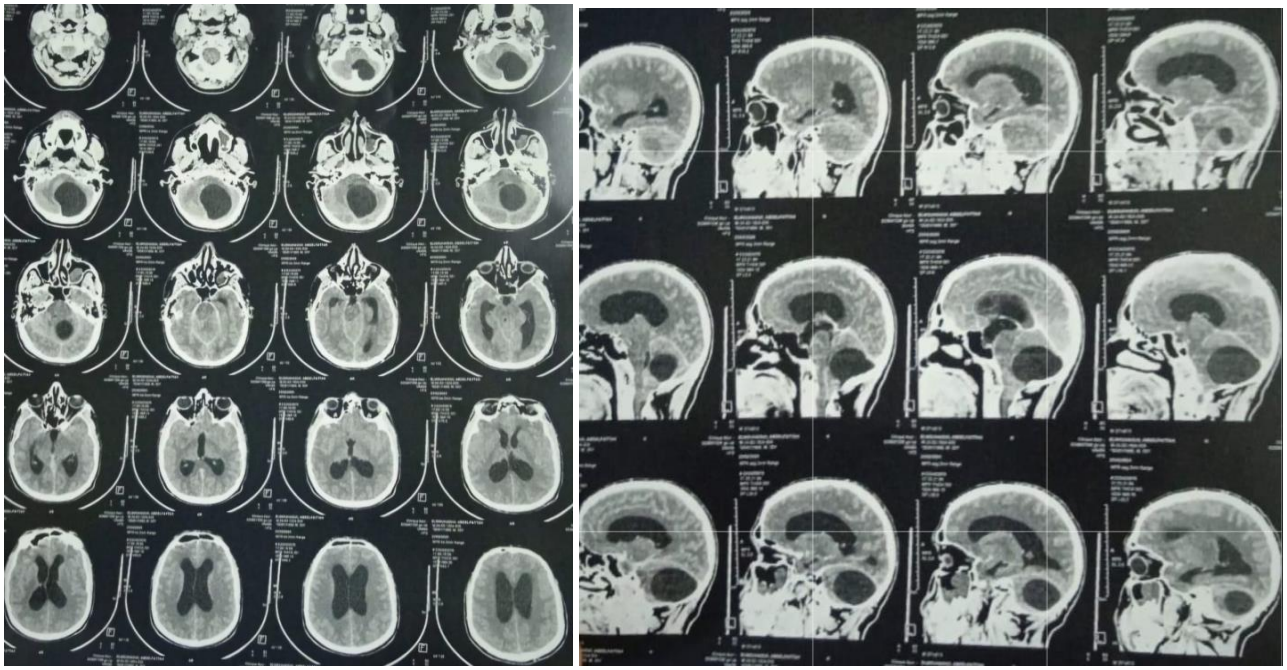

Figure 1: Injected CT, demonstrating a process of the posterior cerebral fossa responsible for passive upstream triventricular hydrocephalus

DISCUSSION

The differential diagnoses for an arachnoid cyst include hydatid cysts and cystic pilocytic astrocytomas. The differential diagnosis is primarily determined based on the radiological evaluation. Intracranial echinococcal cysts are an infrequent occurrence, comprising merely 1–2% of all space-occupying intracranial pathologies [5].

Hydatid cysts:

Typically, these cerebral echinococcal cysts are found in the supratentorial region, predominantly within the middle cerebral artery's domain, with a particular predilection for the parietal lobe. The incidence of echinococcal cysts within the posterior fossa is exceedingly rare [6].

Cerebral hydatid cysts (HCs) are typically unilocular on radiological imaging and exhibit isointensity or isoattenuation relative to cerebrospinal fluid. The fibrous capsule may demonstrate fine

peripheral enhancement. The absence of surrounding edema and the pronounced mass effect facilitate the differentiation of cerebral HCs from abscesses and cystic tumors. A hypointense rim, particularly evident on T2-weighted MR images, is a characteristic feature of cerebral HCs [7].

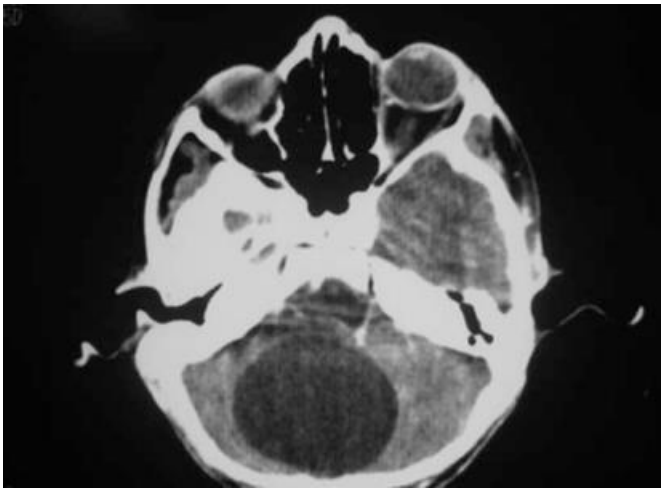

Figure 2: This axial non-contrast enhanced computed tomography scan demonstrates a hypodense cystic lesion in the posterior interhemispheric area within the cerebellar hemispheres of a 10-year-old male patient who presented with headache, vomiting, ataxic gait

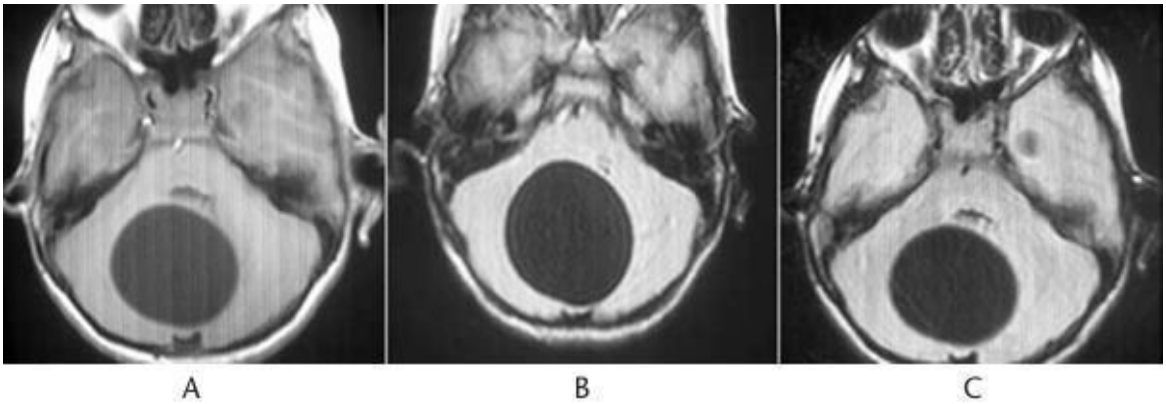

Figure 3: (A) Axial T1-weighted magnetic resonance image demonstrates a well-defined hypointense lesion within the cerebellar hemispheres. (B) Fluid-attenuated inversion recovery T2-weighted magnetic resonanceimage reveals similar signal intensities within the lesion. (C) Contrast-enhanced T1-weighted magnetic resonance image shows an absence of enhancement within the lesion.

Pilocytic astrocytomas:

Pilocytic astrocytoma (PCA), formerly known as cystic cerebellar astrocytoma or juvenile pilocytic astrocytoma, predominantly manifests in the cerebellum. However, it can also occur in the optic pathway, hypothalamus, and brainstem [8].

Pertaining to the neuroaxis, PCAs can occur anywhere along its length. Although PCAs tend to occur close to the midline, they can be more lateral within the cerebellum in adults [9].

- Cerebellum - 42% to 60%
- Optic gliomas C hypothalamic gliomas - 9% to 30% The most common site for PCA related to NF1
- Brainstem - 9%
- Spinal cord - 2%
- Cerebral hemispheres (young adults)

In neuroradiological examinations, the typical finding is usually a non-infiltrative, well-defined biphasic lesion. This lesion consists of a cystic, hypointense area associated with a mural nodule. The mural nodule can exhibit contrast enhancement on magnetic resonance imaging (MRI) and computed tomography (CT) scans.

However, various other patterns, such as solid nodules or entirely cystic lesions, may also be observed [10]. Notably, perilesional edema is not commonly seen, unlike in high-grade primary brain tumors [11].

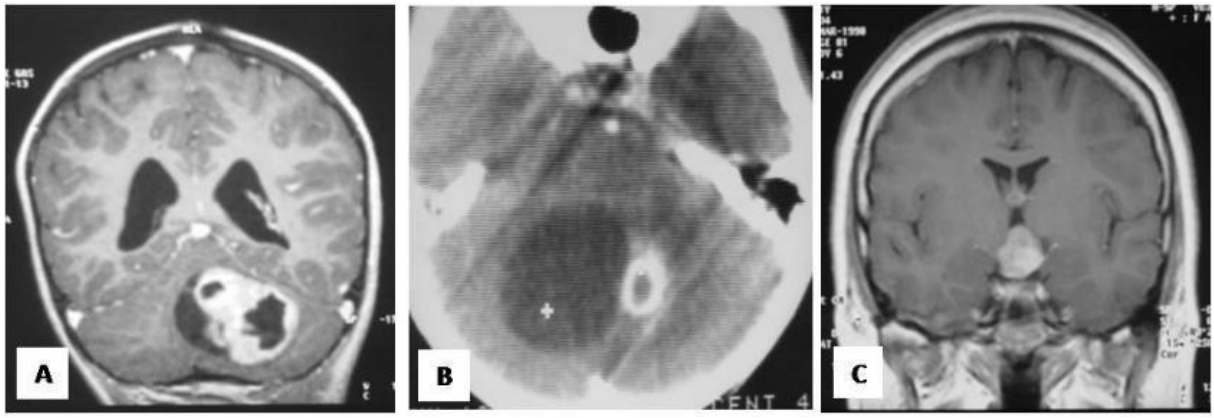

Figure 4: Pilocytic Astrocytomas are characterized by distinct neurorradiological features following intravenous contrast injection. Notably, the absence of perilesional edema is observed even in voluminous lesions.
A. Cerebellar Lesion: - Solid with cystic areas, most common pattern of PA (MRI, coronal view)
B. Cerebellar Lesion: - Predominantly cystic with a mural nodule (CT, axial view)
C. Solid, Suprasselar Lesion: (MRI, coronal view)

In an other study published in 2018, a rare case of a cystic astrocyma was identified in a 25 year old male who prensented Indolent course of headaches and recurrent fainting attacks [12].

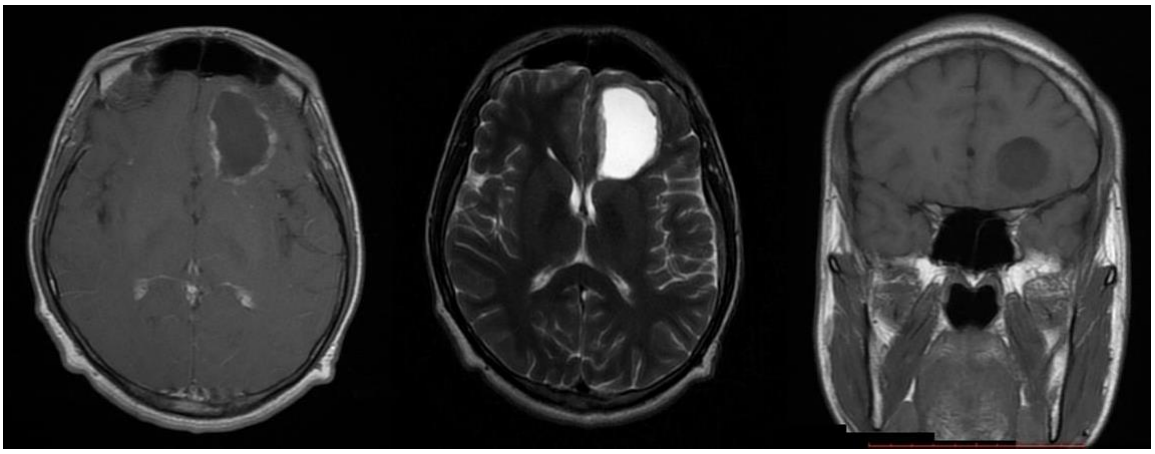

Figure 5: In the left frontal lobe, there is an irregular ovoid-shaped cystic lesion primarily located in a sub-cortical region. It exhibits a smooth outer border and an internal nodular inner surface. The lesion demonstrates low to intermediate signal intensity on T1-weighted images and heterogeneous high signal intensity on T2-weighted images. Post-contrast series reveal intense marginal nodular non-uniform contrast enhancement (ring enhancement) with a central non-enhancing component

CONCLUSION

To summarize, hydatid cysts, pilocytic astrocytoma and other cystic lesions should be taken into consideration in the differential diagnosis of anachnoid cysts The analysis of anamnetic, clinical and radiological data remains essential to establish an appropriate therapeutic strategy.

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Cite This Article: Oufa Jamal, Nassima Daite, Khadija Elguettabi, Amine Elkhamouye, Khadija Ibahioin, Said Hilmani, Abdessamad Naja, Abdelhakim Lakhdar (2025). Arachnoid Cyst of the Middle Fossa: A Case Report and Littérature. *East African Scholars J Med Surg, 7*(8), 184-188.