MSI Journal of
Medicine and Medical Research (MSIJMMR)

Volume: 3, Issue: 3 (Sep- Dec 2026)
Published by *MSI Publishers*
ISSN 3049-1401 (Online)

Received: 30-09-2026
Accepted: 29-10-2026
Published: 03-11-2026

A Rare Posterior Fossa Intraparenchymal Cerebellar Hydatid Cyst Mimicking a Cystic Brain Tumor in a Child

Authors Details

Dr. Abdul Rahim Hamrah[1*]
Head of Neurosurgery Department Abo Ali Sinay Balkhi Regional Hospital- Balkh, Afghanistan

Corresponding author: *Dr. Abdul Rahim Hamrah*

ABSTRACT:

Background: Intracranial hydatid disease is an uncommon manifestation of Echinococcus granulosus infection, accounting for only 1–2% of all hydatid cases. Most intracranial lesions occur supratentorially, whereas intraparenchymal cerebellar hydatid cysts are exceptionally rare, particularly in children. Their radiological appearance may closely resemble other cystic posterior fossa lesions, making preoperative diagnosis difficult.

Case Description: A 9 year old boy from Balkh Province presented with a three year history of headache, gait instability, and lower limb weakness. MRI revealed a large cystic lesion in the left cerebellar hemisphere, initially suspected as pilocytic astrocytoma or arachnoid cyst. Suboccipital craniectomy exposed a laminated hydatid cyst wall, confirming the diagnosis intraoperatively. Because intact removal was not feasible in the confined posterior fossa, controlled decompression and complete excision were performed. The patient improved neurologically and was discharged on day five with albendazole therapy.

Conclusion: Posterior fossa cerebellar hydatid cysts are extremely rare in children and often mimic cystic brain tumors. This case underscores the need to consider hydatid disease in endemic regions and highlights the value of intraoperative recognition. Thepite

DOI: *10.5281/zenodo.23904948*

the surgical challenges of the posterior fossa, controlled decompression and complete excision combined with albendazole therapy can yield favorable outcomes.

Keywords: *Cerebellar hydatid cyst; Posterior fossa; Intracranial echinococcosis; Pediatric neurosurgery; Brain hydatid disease; Case report.*

Introduction

Hydatid disease is a zoonotic infection caused predominantly by the larval stage of Echinococcus granulosus. It remains an important public health problem in sheep-raising regions of the Middle East, Central Asia, the Mediterranean basin, South America, and parts of Africa. Humans become accidental intermediate hosts through ingestion of parasite eggs, with the liver and lungs representing the most frequently involved organs. Central nervous system (CNS) involvement is uncommon, accounting for approximately 1–3% of all hydatid disease, and is encountered predominantly in the pediatric population. (1,2,3)

Intracranial hydatid cysts are characteristically solitary, supratentorial, and located within the territory of the middle cerebral artery, particularly the parietal lobe. In contrast, infratentorial lesions are exceedingly rare, and intraparenchymal cerebellar hydatid cysts constitute only a small fraction of reported cases. (3,5)Because of their rarity and nonspecific clinical and radiological features, these lesions are frequently misdiagnosed as cystic brain tumors, arachnoid cysts, or other posterior fossa cystic pathologies before surgery. (4,5)

Magnetic resonance imaging is the imaging modality of choice for intracranial hydatid disease. Nevertheless, definitive preoperative diagnosis remains challenging in atypical locations such as the posterior fossa. Surgical excision without rupture of the cyst remains the treatment of choice because intraoperative rupture may increase the risk of recurrence, dissemination, and anaphylactic reactions(5,6). However, achieving intact removal may not always be feasible in the confined anatomical space of the posterior fossa, where preservation of adjacent neurovascular structures takes precedence. (7,8)

Only a limited number of pediatric intraparenchymal cerebellar hydatid cysts have been described in the literature. We report the case of a 9-year-old boy with a giant posterior fossa intraparenchymal hydatid cyst that was initially presumed to be a cystic brain tumor.

 DOI: *10.5281/zenodo.23904948*

The diagnosis was established intraoperatively after exposure of the characteristic laminated cyst wall. In addition to presenting the surgical management and outcome, we review the available literature and discuss the diagnostic pitfalls and operative challenges associated with this rare entity.(4,8,9)

Case Presentation

A 9-year-old boy from Chamtal District, Balkh Province, Afghanistan, was referred to the Department of Neurosurgery at Abo Ali Sinay Balkhi Regional Teaching Hospital with a three-year history of progressively worsening headache, gait instability, and bilateral lower-extremity weakness. During the months preceding admission, the patient's functional status had gradually deteriorated, and he became increasingly dependent on family members for ambulation.

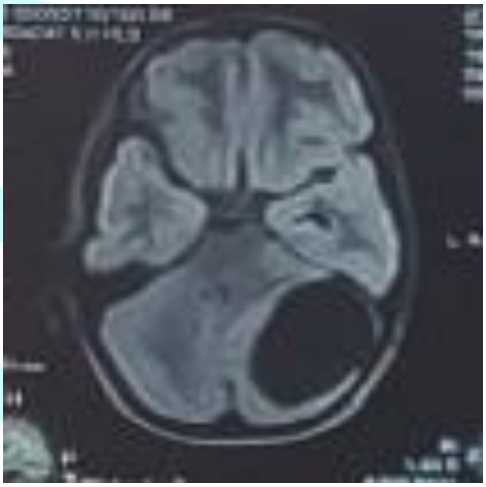


Figure 1: Pre Operative MRI of patient showing left side cystic lesion

Several months before presentation to our institution, the patient had been evaluated at another tertiary neurosurgical center, where surgical intervention had been recommended for a presumed posterior fossa brain tumor. However, because of severe financial constraints, the family was unable to proceed with surgery and returned home without treatment. The patient's symptoms continued to progress until he was admitted to our department.

Neurological examination on admission revealed an alert child with cerebellar ataxia and marked gait impairment. Motor examination demonstrated bilateral lower-limb weakness with a Medical Research Council (MRC) grade of 2/5. Although cranial nerve examination

 DOI: *10.5281/zenodo.23904948*

was otherwise unremarkable, the patient was unable to walk independently because of combined cerebellar dysfunction and motor weakness.

Magnetic resonance imaging demonstrated a well-circumscribed giant intra-axial cystic lesion measuring approximately 55 × 50 × 61 mm within the left cerebellar hemisphere. The lesion appeared hypointense on T1-weighted sequences and hyperintense on T2-weighted sequences, with minimal peripheral contrast enhancement. Significant compression of the surrounding cerebellar parenchyma and distortion of the fourth ventricle were present without radiological evidence of hydrocephalus. Based on the clinical and radiological findings, the preoperative differential diagnosis included pilocytic astrocytoma and arachnoid cyst. Hydatid disease was not considered the leading preoperative diagnosis because of the atypical location and imaging appearance. Similar diagnostic challenges have been described in previously reported posterior fossa hydatid cysts.

Routine laboratory investigations were unremarkable. Abdominal ultrasonography demonstrated no hepatic hydatid cysts or other abdominal involvement. The patient was started on albendazole 400 mg once daily before surgery.

Following informed consent from the patient's parents, a left suboccipital craniectomy was performed under general anesthesia.

Operative Technique

After induction of general anesthesia, the patient was positioned prone with the head secured in a neutral position. A left suboccipital approach was selected based on the preoperative imaging findings. Because the lesion was initially believed to represent a cystic posterior fossa tumor or an arachnoid cyst, the operative strategy was planned accordingly.

Following suboccipital craniectomy, the dura was exposed and appeared markedly thinned by the underlying expansile lesion. During dural opening, an unusually smooth, pearly white membrane was immediately encountered beneath the dura. At that stage, it was uncertain whether this represented an extremely attenuated dura or the wall of the underlying cyst. As the operative field was progressively enlarged, the characteristic

 DOI: *10.5281/zenodo.23904948*

laminated glistening membrane became clearly recognizable, raising a strong intraoperative suspicion of a hydatid cyst.



Figure 2: Intraoperative view

At this point, the operative strategy was immediately modified. Gentle hydrodissection using warm normal saline was attempted to facilitate atraumatic separation of the cyst from the surrounding cerebellar parenchyma. However, because of the limited surgical corridor within the posterior fossa and the large size of the lesion, intact delivery of the cyst proved technically impossible.

To avoid excessive traction on the cerebellum and brainstem, controlled decompression of the cyst was performed. The cyst contents were carefully aspirated, allowing gradual collapse of the cavity. Subsequently, the laminated cyst wall was meticulously dissected from the surrounding brain tissue and removed completely. Although rupture of the cyst occurred during this maneuver, meticulous irrigation and careful removal of all visible cyst remnants were performed to minimize the risk of recurrence.

The total operative time was approximately 2 hours, and the estimated intraoperative blood loss was 100ml. Owing to limited available resources, reconstruction of the suboccipital bone was not feasible, and the procedure was completed as a decompressive craniectomy. The dura was closed in a watertight fashion, and the wound was closed in anatomical layers.

The patient tolerated the procedure well and was transferred to the neurosurgical ward for postoperative observation.

 DOI: *10.5281/zenodo.23904948*

Postoperative Course

The postoperative recovery was uneventful. Computed tomography confirmed satisfactory decompression of the posterior fossa and complete removal of the cystic lesion without evidence of hydrocephalus.

Neurological examination demonstrated significant improvement compared with the preoperative status. Muscle strength in both lower extremities improved after physiotherapyduring his hospital stay from Medical Research Council (MRC) grade 3/5 to 4/5. The patient was able to stand independently, although he still required assistance while walking because of residual cerebellar ataxia.

Albendazole therapy (400 mg once daily) was advised for four months after surgery. Abdominal ultrasonography revealed no evidence of hepatic hydatid disease. The patient was discharged home in stable condition on the fifth postoperative day after receiving physiotherapy and instructions for outpatient follow-up. Unfortunately, despite repeated recommendations, he did not return for subsequent clinical or radiological follow-up.

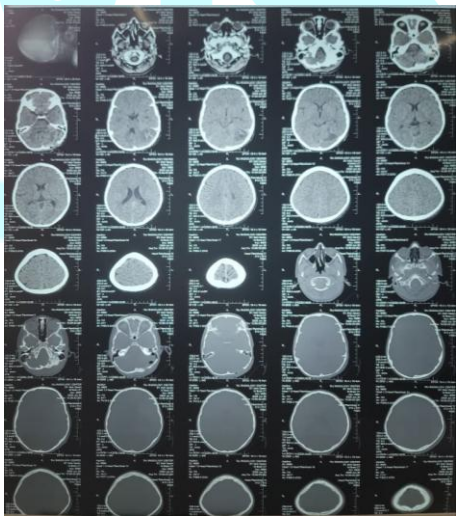


Figure 3: Post Operative CT-Scan of the patient showing mild gliotic change in cerebellar region

Discussion

The present case illustrates several important diagnostic and surgical aspects of posterior fossa hydatid disease. Although intracranial hydatid cysts have been recognized for decades, cerebellar intraparenchymal involvement remains exceptionally uncommon. Owing to its rarity, both radiological interpretation and operative planning may initially

DOI: *10.5281/zenodo.23904948*

favor more common cystic lesions of the posterior fossa, particularly pilocytic astrocytoma, arachnoid cyst, epidermoid cyst, or cystic hemangioblastoma. This diagnostic uncertainty has been consistently reported in previously published cases and systematic reviews(4,8,9).

One of the distinctive features of the present case was the complete absence of preoperative suspicion for hydatid disease despite the patient's residence in an endemic region. The lesion had previously been evaluated at another tertiary neurosurgical center and was also considered to represent a posterior fossa brain tumor. Similar diagnostic pitfalls have been described in the literature, emphasizing that cerebellar hydatid cysts frequently mimic neoplastic lesions because of their well-circumscribed appearance and nonspecific clinical presentation (4,7,8,9).

Perhaps the most educational aspect of this case was the intraoperative evolution of the diagnosis. Immediately after opening the dura, the surgical team encountered an unusually thin dura with a smooth pearly-white structure immediately beneath it. Initially, differentiation between markedly attenuated dura and the wall of the cyst was difficult. Only after wider exposure did the characteristic laminated membrane become unmistakable, immediately changing the operative diagnosis and surgical strategy. To our knowledge, this stepwise intraoperative diagnostic transition has received little emphasis in previous reports and represents an important practical lesson for neurosurgeons managing atypical posterior fossa cystic lesions(4,7,8).

The classical Dowling-Orlando technique remains the preferred method for surgical treatment because it aims to deliver the cyst intact using gentle hydrodissection, thereby minimizing the risks of recurrence, dissemination, and anaphylaxis. Nevertheless, the applicability of this technique depends greatly on anatomical location. Most successful reports of intact removal involve superficial supratentorial cysts where gravity and hydrostatic pressure facilitate delivery. In contrast, the posterior fossa offers a narrow operative corridor with limited working space and close proximity to the cerebellum, brainstem, and lower cranial nerves. Under these circumstances, strict adherence to classical hydrodissection may not always represent the safest option(6,7,10).

DOI: *10.5281/zenodo.23904948*

In our patient, warm normal saline hydrodissection was attempted as the initial maneuver. However, because of the confined infratentorial anatomy and the large size of the lesion, intact extraction proved impossible. Controlled decompression of the cyst followed by meticulous excision of the laminated membrane was therefore undertaken. Although intraoperative rupture occurred, the entire cyst wall was removed, the operative field was thoroughly irrigated, and no perioperative anaphylactic reaction or other immediate complication developed. Early neurological recovery was favorable, with marked improvement in lower-extremity motor strength and functional status(7,8).

Another notable aspect of this case is that no hepatic involvement was identified on abdominal ultrasonography. Although the liver and lungs are the most common sites of hydatid disease, isolated intracranial hydatid cysts have been documented, particularly in children. This finding reinforces the concept that the absence of extracranial disease should not exclude the diagnosis of cerebral hydatid disease in endemic regions(8,9).

Comparison with previously published reports reveals both similarities and important differences. Like several pediatric cases reported from endemic countries, our patient presented with headache, gait disturbance, and cerebellar dysfunction. However, unlike many published cases in which intact removal was feasible, the confined posterior fossa anatomy in our patient necessitated controlled decompression before complete removal of the laminated membrane. This difference highlights the need for individualized operative decision-making rather than rigid adherence to a single surgical technique(4,5,7,8).

Conclusion

Posterior fossa intraparenchymal hydatid cyst is an exceptionally rare manifestation of cerebral echinococcosis that may closely mimic cystic posterior fossa neoplasms in children. This case highlights the importance of maintaining a high index of suspicion in endemic regions, even when neuroimaging favors a neoplastic lesion. Recognition of the characteristic laminated membrane during surgery is of particular importance because it may immediately alter the operative strategy. Although intact cyst removal remains the preferred surgical objective, this report demonstrates that controlled decompression followed by meticulous excision of the laminated cyst wall may constitute a safe and effective alternative when anatomical constraints preclude en bloc removal. Early surgical

DOI: *10.5281/zenodo.23904948*

intervention resulted in significant neurological recovery despite the prolonged duration of symptoms.

References

1. Braithwaite PA, Lees RF. Cerebral hydatid disease: a review of 230 cases. Br J Surg. 1981;68:302-305.
2. Ciurea AV, Fountas KN, Coman TC, et al. Long-term surgical outcome in patients with intracranial hydatid cyst. Acta Neurochir (Wien). 2006;148:421-426.
3. Dowling E Jr. Hydatid cysts of the brain. Surg Gynecol Obstet. 1950;91:436-442.
4. Elvan-Tuz A, et al. Cerebellar hydatid cyst in childhood: case report. Childs Nerv Syst. 2021.
5. Fakhouri F, Al-Holou WN, et al. Cerebellar hydatid cyst in a child: case report and review of the literature. Surg Neurol Int. 2015.
6. Is M, Gezen F, et al. Cerebellar hydatid cyst: case report. Turk Neurosurg. 2009.
7. Kammerer WS, Schantz PM. Echinococcal disease. Infect Dis Clin North Am. 1993;7:605-618.
8. Kayaoglu CR, et al. Posterior fossa hydatid cyst in a child. Pediatr Neurosurg. 2008.
9. Turgut AT, Altin L, Topçu S, et al. Unusual imaging characteristics of complicated hydatid disease. Eur J Radiol. 2007;63:84-93.
10. Turgut M. Hydatid disease of the central nervous system: a review. Neurosurg Rev. 2001;24(4):200-208.

DOI: *10.5281/zenodo.23904948*