Afghanistan Journal of Infectious Diseases
AJID
https://ajid.ghalib.edu.af/index.php/ajid

2025 July 3(2): 197-202

Orbital Hydatid Cyst in Pediatric Patients: Report of Two Rare Cases from Afghanistan

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ARTICLE INFO

Type: Case Report
Received: 20/05/2025
Accepted: 06/07/2025

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To cite this article: Mudafi J, Mesbah AB, Islam Saeed KM, Mohsan MA, Mosawi SH. Orbital Hydatid Cyst in Pediatric Patients: Report of Two Rare Cases from Afghanistan.
Afghanistan Journal of Infectious Diseases. 2025 July 3(2):197-202.
https://doi.org/10.60141/ajid.110

ABSTRACT

Orbital hydatid cyst is a rare manifestation of echinococcosis, comprising less than 1% of cystic echinococcosis. It most frequently affects the pediatric population and typically presents as a slowly enlarging orbital mass, causing progressive proptosis, restricted ocular motility, diplopia, and occasionally visual impairment. Hereby, we present two pediatric orbital cases from Afghanistan between 2021 and 2022, with one patient had right eye proptosis and diplopia: the other presented with left upper eyelid swelling and ptosis. Imaging revealed medial intraconal cystic lesions in both cases. Surgical excision via medial orbitotomy was performed; one cyst ruptured intraoperatively and was managed with scolicidal irrigation, while the other was removed intact. Parasitology and postoperative serology confirmed the diagnosis. Albendazole therapy was administered, and no recurrence was observed during 12- and 24-months follow-up. These cases underscore the importance of considering hydatid cysts in the differential diagnosis of orbital masses in endemic regions and highlight the role of early imaging and careful surgical management, and is particularly uncommon in children.

Keywords: Hydatid cyst, Orbit, Pediatric case, Echinococcosis, Surgery, Afghanistan

Introduction

Cystic echinococcosis (CE), is a parasitic zoonosis caused by the larval stage of *Echinococcus granulosus or E. multilocularis*, primarily affecting populations in endemic regions such as the Middle East, North Africa, and Central Asia (1). The disease is typically transmitted through ingestion of parasite eggs shed in the feces of infected dogs, with humans acting as accidental intermediate hosts (2). Once ingested, the oncospheres penetrate the intestinal wall and can lodge in various organs. The liver (60%-70%) and lungs (20%-30%) are the most common sites of cyst formation, while involvement of other organs, such as the central nervous system, bones, and orbit is less common (3).

Orbital echinococcosis is extremely rare, comprising less than 1% of CE. It most frequently affects the pediatric population and typically presents as a slowly enlarging orbital mass, causing progressive proptosis, restricted ocular motility, diplopia, and

occasionally visual impairment (4, 5). The disease may be misdiagnosed due to its resemblance to other benign or malignant orbital masses, especially in non-endemic or resource-limited regions (6). Radiological imaging, particularly MRI and CT, plays a key role in diagnosis. MRI provides superior soft-tissue contrast and helps define the cystic structure, location, and relation to adjacent ocular muscles, which is crucial for surgical planning (7). Confirmation, however, ultimately relies on histopathology, often supported by serological tests (8). In endemic countries like Afghanistan, where zoonotic infections are often underdiagnosed due to limited resources, isolated orbital hydatid cysts are rarely reported in the literature. Pediatric cases, in particular, deserve attention due to their unique presentation and the potential for vision-threatening complications. Our report presents two cases of primary, isolated orbital CE in Afghan children with no prior systemic involvement or history of animal exposure.

The purpose of reporting these cases was to raise awareness about rare but significant differential diagnoses of orbital masses in endemic, low-resource settings and to contribute original data from Afghanistan to the international literature.

Case Description

This study describes two patients who underwent surgery for orbital hydatid cysts between 2021 and 2022, highlighting their clinical symptoms and signs, radiological and parasitological investigations, and the operative techniques used.

Case 1: A 13-year-old girl from Baghlan Province, Afghanistan, presented to the Ophthalmology Department of Shah Amanullah Hospital on Mar 26, 2022, with a one-month history of progressive right eye proptosis. The condition began shortly after a minor trauma to her foot, but no direct orbital injury was reported. On examination, her best corrected visual acuity in the right eye was 6/36. The globe was displaced laterally and inferiorly, leading to noticeable upward globe dystopia and diplopia on horizontal gaze. Ocular motility was restricted in the medial direction. Mild conjunctival injection and chemosis were observed. No systemic symptoms such as fever or constitutional complaints were present. The patient had no history of animal contact, including dogs or livestock. Routine blood tests were within normal limits. Orbital magnetic resonance imaging (MRI) revealed a sharply demarcated, intraconal cystic lesion in the medial orbit, originating near the medial rectus muscle and causing mechanical displacement of the globe (Figures 1, 2).

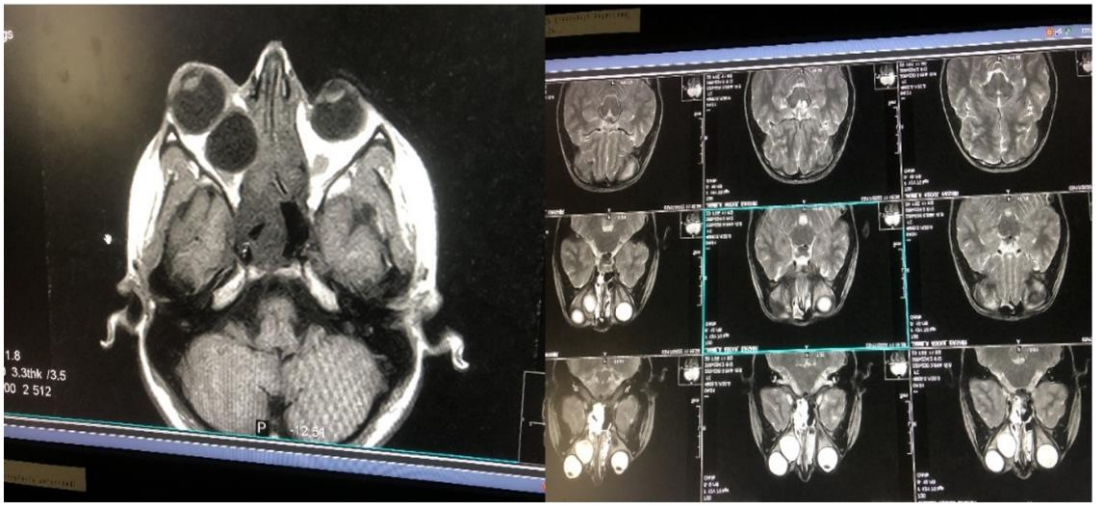

Figure 1: Axial orbital MRI of first case showing a sharply demarcated intraconal cystic lesion located medially in the right orbit, displacing the globe laterally and inferiorly.

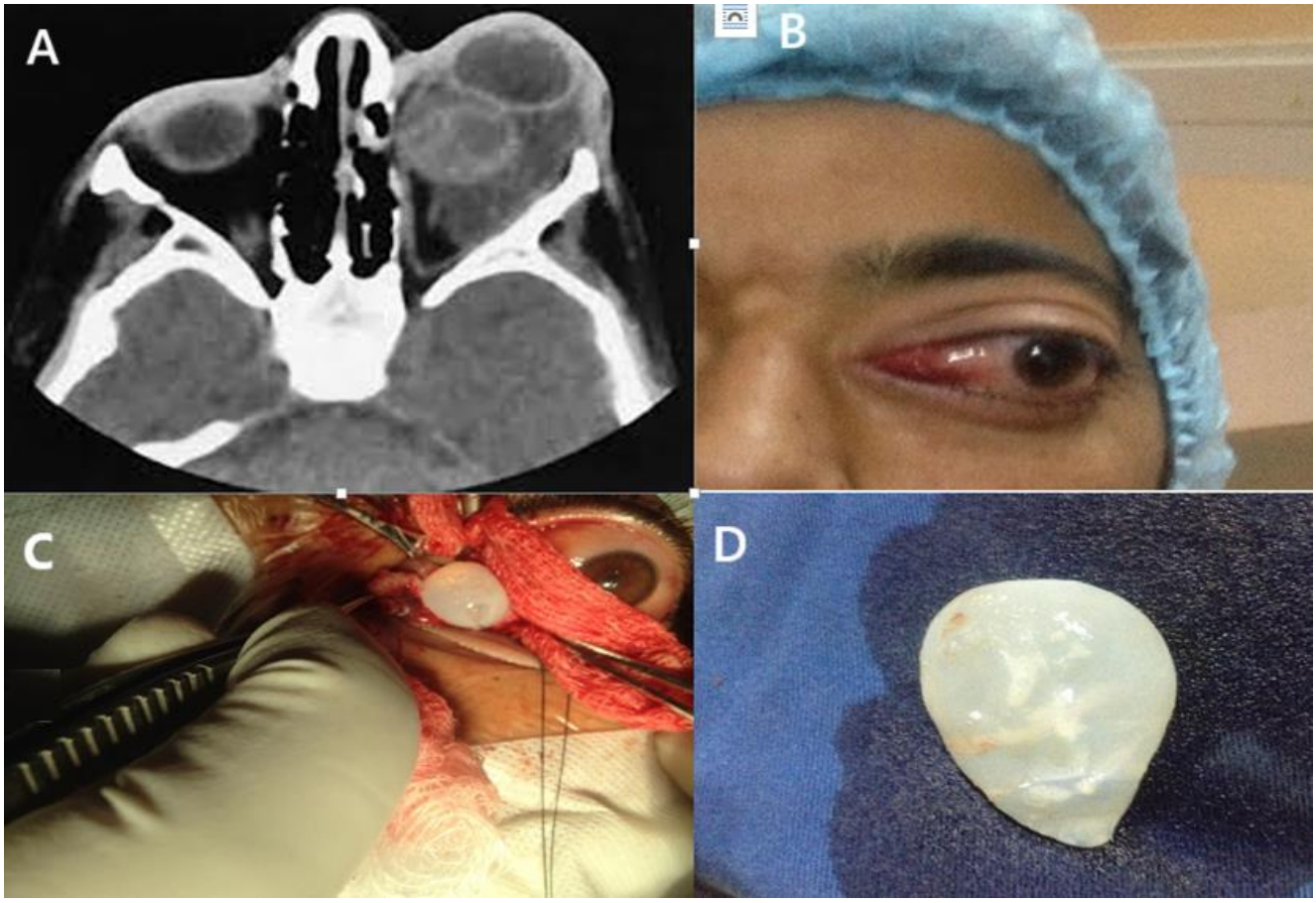

Figure 2: A: Axial MRI of Patient 2 revealing a well-defined, non-enhancing cystic lesion in the left medial orbital compartment, causing anterior and lateral displacement of the globe, B: Proptosis and exotropia of the right eye, C: the hydatid cyst during operation, and C: the extracted ruptured hydatid cyst.

The differential diagnosis included dermoid or epidermoid cyst, abscess, mucocele, hematoma, encephalocele, and hydatid cyst. Given the cystic nature, endemic setting, and imaging features, a hydatid cyst was considered the most likely diagnosis. The patient was started on preoperative albendazole (15 mg/kg/day) for one month to reduce cyst tension and sterilize the contents. A retrocaruncular medial orbitotomy was performed to remove the lesion. During the procedure, the cyst ruptured. Immediate intraoperative irrigation was carried out using hypertonic saline and povidone-iodine to prevent dissemination and reduce the risk of anaphylaxis. Parasitological microscopic examination confirmed the diagnosis of hydatid cyst, revealing a laminated ectocyst and inner germinal layer containing protoscolices. The presence of protoscolices is considered the gold standard in confirming echinococcosis (Figure 3).

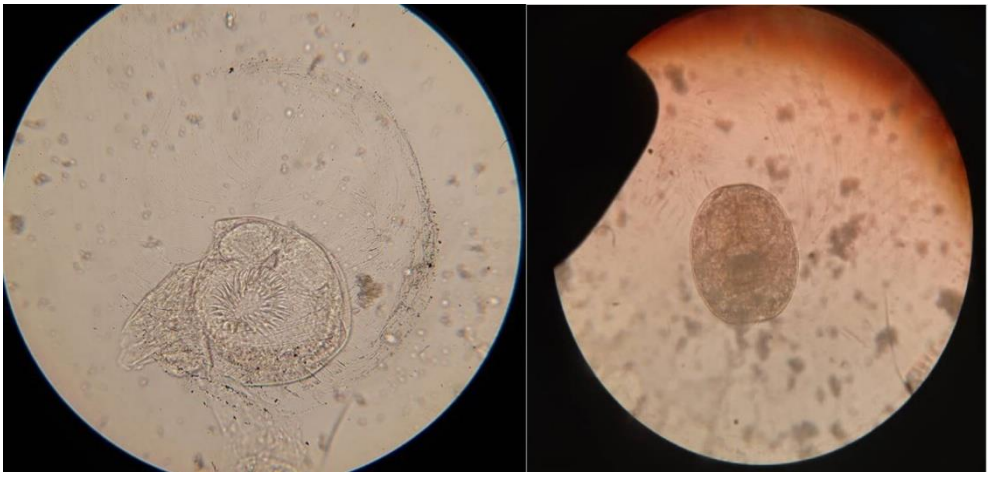

Figure 3: Representative parasitological image showing structural details of the protoscolices. Left: Evaginated protoscolex with visible hooks, Right: An invaginated protoscolex with internalized hooks. x400.

Postoperative serological testing for *E. granulosus* returned positive at a titer of 1:160.

The patient was monitored clinically and radiologically for 12 months. She remained asymptomatic, with no signs of recurrence or systemic spread. Visual acuity remained stable and ocular motility moderately improved. However, due to difficulties in follow-up communication, updated data beyond one year was unavailable.

Case 2: A 14-year-old boy from Kunduz Province presented on Jun 1, 2021, with a four-month history of progressive left upper eyelid swelling and ptosis. The symptoms were mild at onset but gradually worsened. The patient had tried several courses of systemic antibiotics and NSAIDs with no improvement. There was no history of trauma or animal contact. At presentation, his best corrected visual acuity was 6/18. Examination revealed swelling in the left supramedial orbit, with mild conjunctival hyperemia and pain. Eye movements were restricted in the medial direction. Fundus examination showed mild optic disc swelling. The globe was displaced anteriorly and laterally by the underlying mass. Routine blood tests were unremarkable. Orbital MRI and CT scan showed a well-circumscribed cystic lesion in the medial orbital space adjacent to the medial rectus muscle (Figure 4), consistent with the imaging features of a hydatid cyst.

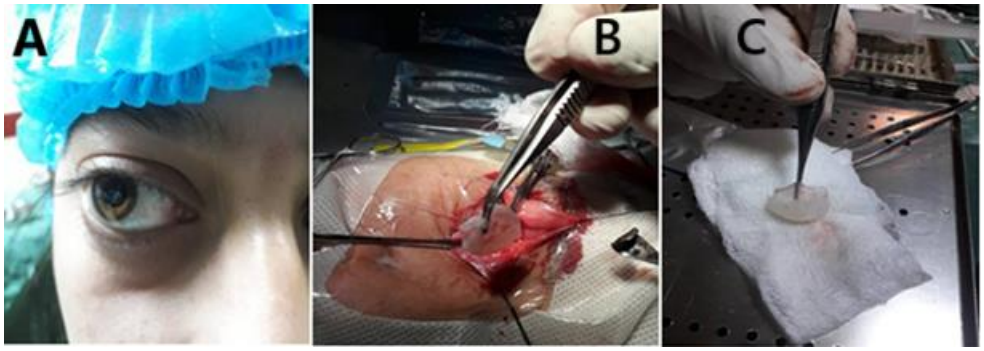

Figure 4: A**:** Preoperative appearance of patient. The right eye is proptotic and displaced up and laterally, B: the hydatid cyst during operation, and C: the extracted hydatid cyst.

The differential diagnosis included dermoid cyst, mucocele, teratoma, encephalocele, and hydatid cyst. Given the lesion's imaging appearance, slow progression, and

local epidemiological context, a hydatid cyst was strongly suspected. Albendazole therapy was initiated and continued for one month pre- and postoperatively. A medial orbitotomy was performed and the cyst was successfully excised without rupture. The surrounding tissues were irrigated with hypertonic saline to prevent secondary seeding. Parasitological test confirmed hydatid cyst. The patient was followed up regularly for 24 months postoperatively. There was no evidence of recurrence or systemic dissemination. Ocular motility improved, the eyelid swelling resolved, and vision remained stable. At the final follow-up, the patient was asymptomatic and free of disease. However, as with the first case, extended follow-up was limited due to loss of contact.

Discussion

Orbital hydatid disease is a rare but clinically significant manifestation of echinococcosis, comprising less than 1% of all hydatid cysts. Its rarity often leads to diagnostic delays, particularly in pediatric populations where early signs may mimic benign orbital lesions. In our report, two Afghan children presented with isolated medial intraconal cysts and no systemic involvement an uncommon presentation that warranted thorough radiological and surgical evaluation. Comparative analysis with similar international reports provides valuable insights.

For instance, 10 cases in Morocco were reviewed and most lesions were located superomedially, with few cases involving medial compartments, similar to our patients (9). Al-Muala et al. presented an Iraqi case with medial orbital involvement and similar symptoms of proptosis and eye movement restriction, reinforcing the significance of anatomical location in clinical manifestation (10). Berradi et al. also documented an isolated orbital hydatid cyst in a patient with no livestock exposure, supporting our findings of indirect transmission routes in endemic zones (11). Kahveci et al. described surgical removal of an orbital cyst via medial orbitotomy in a pediatric patient, yet their case experienced postoperative diplopia—an outcome not seen in our patients who showed gradual recovery without visual deficit (12). Ciurea et al. reported two pediatric cases with delayed diagnosis, resulting in irreversible vision loss, highlighting the importance of early imaging and intervention (13). Somay et al. reported intraoperative rupture of an orbital cyst, managed with scolicidal irrigation—a complication mirrored in our first patient and effectively addressed (14). These international comparisons emphasize the variable presentations, outcomes, and management challenges of orbital hydatid disease across endemic settings. Our cases contribute to this growing body of literature by demonstrating successful diagnosis, surgical intervention, and follow-up in a resource-limited, conflict-affected region, reinforcing the need for heightened clinical suspicion and timely management.

Conclusion

Orbital hydatid cyst, although extremely rare, should be considered in the differential diagnosis of orbital masses in children residing in endemic areas even in the absence of direct exposure to definitive hosts. Prompt recognition, accurate radiological assessment, careful surgical excision, and appropriate antiparasitic therapy are essential for favorable outcomes. These two cases underscore the importance of clinical vigilance in low-resource, high-prevalence settings and add to the limited but growing body of literature on orbital echinococcosis. Long-term follow-up remains important to monitor for recurrence, and further case documentation is necessary to better understand epidemiological variations and improve clinical guidelines.

Ethical Considerations

This study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the institutional review board of Shah Amanullah Hospital prior to data collection and case documentation. Patient confidentiality has been strictly preserved throughout the reporting process. Written informed consent was obtained from both patients' guardians for the publication of this case report and the accompanying clinical images. Identifying facial features were excluded in the published images to maintain privacy.

Acknowledgements

The authors would like to thank the ophthalmology and surgical teams at Shah Amanullah Khan Hospital for their support during the diagnosis and management of these cases. We are also grateful to the Afghanistan National Public Health Institute (ANPHI) for their valuable collaboration in the preparation and scientific development of this case report.

Funding

No external funding was received for the preparation, analysis, or publication of this case report.

Conflict of interest

The authors declare that there is no conflict of interests.

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