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Renal Hydatid Cyst in Children: A Case Report

A. Afif[1,2*], N. Aballa[1,2,3], S. El Moussaoui[1,2,3], W. Lahmini[1,2,3], E.E. Kamili[1,2,3], M. Bourrous[1,2,3]

[1]Paediatric Emergency Department, Paediatric Surgery Department Hôpital mère-enfant, CHU Mohammed VI Marrakech
[2]Marrakech Faculty of Medicine and Pharmacy, Cadi Ayyad University
[3]Child Health and Development' Research Laboratory

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***Corresponding author:** A. Afif
Paediatric Emergency Department, Paediatric Surgery Department Hôpital mère-enfant, CHU Mohammed VI Marrakech

Abstract **Case Report**

The hydatid cyst, or hydatidosis, is a zoonotic infectious disease caused by the development of the larval form of the Echinococcus granulosus tapeworm in humans after accidental ingestion of embryonated eggs, which hatch into oncospheres and transform into hydatid cysts. Renal hydatid cyst is extremely rare in children. The positive diagnosis relies on epidemiological, clinical, radiological, and biological arguments. The standard treatment remains surgery. We report the case of a 5-year-old male child hospitalized for an isolated renal hydatid cyst fistulized into the urinary tract, revealed by lumbalgia and hydatiduria with a proteus mirabilis urinary infection on the cytobacteriological examination of urine. Paraclinical examinations, including ultrasound and uro-CT -scan, aided in diagnosis. Histopathological analysis confirmed the diagnosis of renal hydatidosis. Management was conservative surgical, with partial pericystectomy performed in our patient, resulting in a favorable outcome.

Keywords: Hydatid Cyst - Kidney - Echinococcus granulosus - Child - Gharbi Classification.

INTRODUCTION

Hydatid cyst is an anthropozoonosis with definitive hosts being canids. Humans, being accidental hosts, become contaminated through oral ingestion of Echinococcus granulosus eggs. The most commonly affected organs in hydatidosis are the liver and lungs [1]. Renal localization of hydatid cyst remains rare, especially in children [2]. Patients with renal hydatid cysts can remain asymptomatic for a long period due to the progressive development of the hydatid cyst. Radiological investigations are essential for positive diagnosis and severity assessment since clinical presentations are not specific. Ultrasound and computed tomography are the most commonly used imaging modalities, allowing diagnostic orientation and providing the most interesting arguments for the presumptive diagnosis [3,4]. Hydatid cyst poses a significant public health problem in highly endemic countries, emphasizing the importance of establishing strict prophylactic measures aimed at breaking the parasite's life cycle. Progress in prevention efforts will help limit this endemicity [3,5].

In this article, based on a clinical observation and a review of the literature, we will illustrate the clinical, paraclinical, and therapeutic aspects of renal hydatid cyst in children.

CASE REPORT

We reported the case of a 5-year-old male child, originating from and residing in the rural area of Zagora, the youngest of 5 siblings, with a history of undocumented recurrent urinary tract infections treated on an outpatient basis. Symptoms began 7 days prior to admission with the onset of dysuria accompanied by right-sided lumbago, associated with the passage of 2 grape-like skin membranes in the urine (Figure 1). All evolving in a context of unauthenticated fever deterioration in general condition. Clinical examination revealed a pale patient, hemodynamically and respiratorily stable but febrile at 39.2°C. He exhibited diffuse abdominal tenderness, more pronounced in the right hypochondrium, flank, and hypogastric regions, with no hepatomegaly noted. The remainder of the examination was unremarkable.

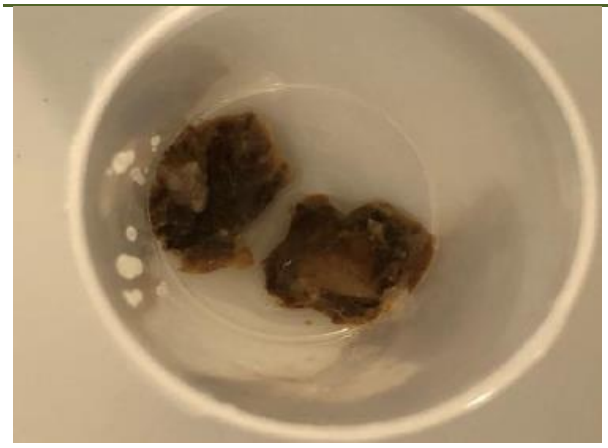

Figure 1: Photo showing the two membranes emitted by urine

On the Biological front: Urine cytobacteriological examination showed cloudy urine with a leukocyturia of 4,198,000 elements. The culture was positive for Proteus mirabilis. Renal function test was normal, with a urea level of 0.34 and a creatinine level of 2.4 mg/l. Blood cell count noted a normal leukocyte count of 6,820 with no eosinophilia, with a count of 180, and the presence of hypochromic microcytic anemia at 8.9. The CRP (C reactive protein) was elevated at 267.

On the Radiological Side: Urinary tract ultrasound (Figure 2) revealed the presence of a right upper pole renal cyst measuring 3.9 x 3.2 cm with detachment of the germinal membrane, likely indicative of a type II hydatid cyst according to the GHARBI classification (see Annex 1), with minimal right hydronephrosis associated with a lower calyx stone measuring 1.2 x 1 cm.

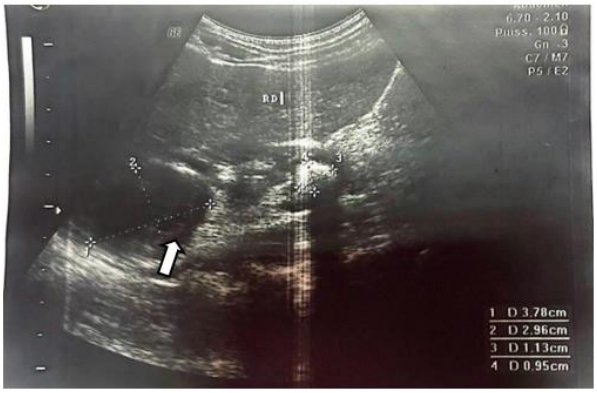

Figure 2: Ultrasound image showing a right renal hydatid cyst

The uro CT-scan was performed for further characterization. It revealed right-sided cystic formations with thin walls and regular contours, located in the upper pole, measuring 2.7 x 3.5 cm for the largest one, one of which is completely calcified, appears to communicate with the calyceal cavities, associated with severe right ureterohydronephrosis suggesting ruptured hydatid cysts in the urinary tract (Figure 3). The left kidney showed no abnormalities in terms of size and function. Thoraco-abdominal CT-scan did not reveal any other cystic locations, particularly in the lungs or liver. Histopathological examination of the membranes showed morphological features consistent with a hydatid cyst.

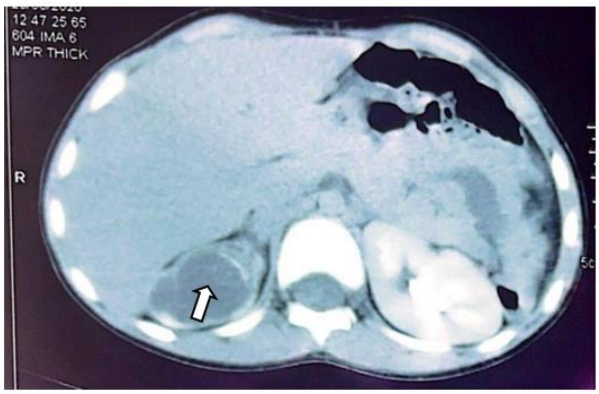

Figure 3: CT-scan image showing a right renal hydatid cyst

Based on the clinical presentation and paraclinical results from imaging and histopathological examination, a diagnosis of right renal hydatid cyst fistulizing into the urinary tract was established, and surgical intervention was planned. Management consisted of a partial pericystectomy. The abdomen was incised via a right anterolateral lumbotomy to access the retroperitoneum and the wall of the hydatid cyst. Exploration revealed a swelling in the right upper pole. A nephrotomy and repeated washing of the cavity communicating with the lower pole were carried out, then evacuation of several yellowish proligate membranes, and closure with 2 intra-cystic drains and in the renal compartment.

DISCUSSION

Hydatid cyst is a parasitic condition resulting from contamination by the parasite Echinococcus granulosus. Human infestation is accidental, typically occurring through ingestion of food or water contaminated with parasite eggs or through direct contact with infected animals, particularly dogs and cattle. The parasite eggs are highly resistant and can survive in the environment for long periods [6]. Hydatid cyst is endemic in Morocco and certain parts of the Mediterranean basin, South America, the Middle East, Australia, and South Africa, posing a significant public health problem [3,7]. Pulmonary localization is the most common in children, followed by hepatic localization. Together, these two localizations account for 90% of cases of hydatidosis [5]. Renal localization ranks third after pulmonary and hepatic localization in children [5]. Although rare, the kidney represents the most common site within the urogenital tract [5]. The history of hydatid contact is supportive of a presumptive diagnosis.

Renal hydatid cyst can jeopardize renal function and even life prognosis due to the risk of cyst rupture, superinfection, and compression of neighboring organs.

Its diagnosis should be suspected in the presence of a cystic mass in a patient originating from an endemic area [3]. The clinical presentation is not specific, with hydatiduria being the only pathognomonic sign, indicating cyst rupture into the urinary tract [5]. Renal hydatid cyst can remain asymptomatic for several years due to its slow growth and retroperitoneal location, sometimes resulting in the discovery of large masses before clinical manifestations occur, which mainly depend on whether the cyst ruptures and signs of compression of neighboring organs [5,8]. The most commonly reported clinical presentations include pain, fever, nausea, vomiting, bloating, anorexia, and weight loss [3,4]. It can also be incidentally discovered during the evaluation of another localization. In our patient, renal hydatid cyst was revealed by hydatiduria associated with signs of urinary tract infection.

Imaging investigations are essential for differential diagnosis due to the not specific or even asymptomatic clinical presentations, and thus the diagnosis of hydatidosis has greatly benefited from the contribution of imaging [9]. Ultrasound is the key first-line examination, guiding the diagnosis; it reveals the cyst's liquid content, the presence of pericystic calcifications, and sometimes the existence of a membrane detachment or daughter cysts [3,9]. Ultrasound also helps specify the size, location, and evolutionary status of the cyst [10], thus enabling the identification of associated abdominal lesions. The Gharbi classification, consisting of 5 stages for hepatic hydatid cysts, is applicable to renal hydatid cysts (see Annex 1).

Renal hydatid cyst is generally primary, almost always solitary, located in the cortical region, and preferably at the pole, as was the case with our patient [2,5]. Ultrasound allows for almost pathognomonic diagnosis in stages 2 and 3. However, in type 4, ultrasound may present diagnostic challenges compared to abscesses and malignant tumors. The diagnostic value of ultrasound for renal hydatid cysts is low when their size is less than 2cm [10]. Computed tomography remains a more precise examination as it allows for a more accurate visualization of the size, location, and relationships of the lesion with neighboring organs [11]. Hydatidosis may be accompanied by eosinophilia, although it is neither constant nor specific. Its absence does not rule out the diagnosis [4,13]. In our patient, eosinophilia was not found. The search for the scolex in urine is the pathognomonic examination for renal hydatid cysts when the parasite is detected, but this examination is only positive in cases of hydatiduria.

Positive serological tests confirm the diagnosis, while negative tests do not exclude it [6,14]. No serological test was performed on our patient. Therapeutic management depends mainly on the size, number, location of the cysts, the presence of other affected organs, and the overall health status of the child [11,13]. Surgery remains the cornerstone of therapeutic management for renal hydatid cysts in children [11,12]. Thus, excision should be as conservative as possible to preserve the maximum amount of functional renal tissue [15]. Open surgery, particularly lumbotomy, remains the traditionally practiced approach. It helps minimize the risk of dissemination [9]. Treatment includes a mandatory step, cystectomy, which involves removal of the hydatid membrane. This can be achieved through partial or total pericystectomy, or even partial or total nephrectomy, depending on the extent of renal parenchymal damage.

Partial pericystectomy remains the recommended procedure by the majority of authors, as it is generally sufficient for most renal hydatid cysts, yielding excellent results and allowing for good expansion of the renal parenchyma [3]. Partial pericystectomy involves extracting the proligate membrane and any daughter cysts after sterilization of the cyst with a scolicidal solution, along with resection of the protruding dome (resection of the avascular and exteriorized superficial part of the cyst without touching the parenchyma). Percutaneous aspiration under radiological guidance has also been described as an alternative to surgery, although there is evidence that disease dissemination remains a potential side effect [11]. This method is typically reserved for patients with contraindications to surgery. The role of medical treatment is controversial. Data favor medical treatment combined with surgical treatment over curative medical treatment alone. Its main indications are disseminated or multiple hydatidosis and residual renal hydatid cysts after surgery [9,16].

In the absence of treatment, the renal hydatid cyst increases in volume and may rupture into the urinary tract, posing a risk of superinfection. The cyst can damage the kidney either by compressing the parenchyma or by obstructing the urinary tract. Exceptionally, the evolution may lead to calcification [6].

CONCLUSION

Renal hydatid cyst in children represents a rare pathological entity. The epidemiological context, clinical and laboratory data, as well as radiological aspects, allow for a preoperative presumptive diagnosis in endemic areas. Management is primarily surgical and typically conservative [16]. The true treatment for hydatidosis remains prophylactic. Therefore, there is interest in implementing preventive strategies and raising awareness about prevention measures to reduce exposure to parasite eggs, such as frequent hand washing, education on hygiene, and vaccination of domestic animals.

Annex 1: The Gharbi classification [17,18] is the oldest and most widely used classification system,

allowing differentiation between 5 types of hydatid cysts (figure 4):

Type I	Pure liquid collection
Type II	Collection with complete or partial detachment of membranes
Type III	Multivesicular collection with the presence of endocavitary daughter vesicles (honey comb appearance).
Type IV	Pseudotumoral solid focal lesion
Type V	Cyst with calcified wall

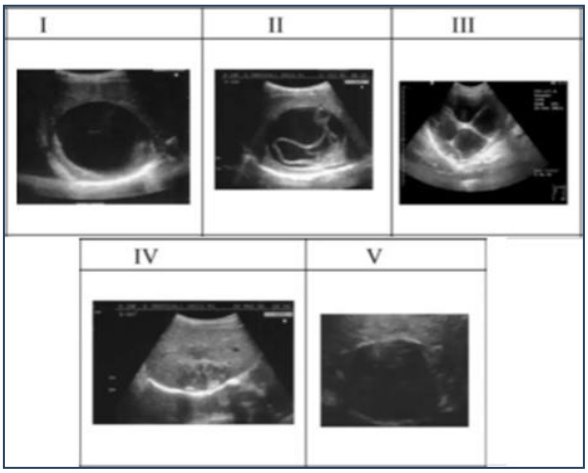

Figure 4: Gharbi ultrasound classification [18]

Conflicts of interest: None

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