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Isolated Hydatid Cyst of the Left Kidney, Complicated by Rupture of the Renal Capsule: A Case Report

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Abstract **Case Report**

Hydatid disease is a rare parasitic infection that is endemic in certain countries in the Mediterranean basin, including Morocco. Renal involvement is very rare, accounting for only 2 to 3% of visceral forms. Diagnosis remains difficult and is suspected on the basis of epidemiological, clinical, radiological, and biological evidence. The clinical symptoms vary and depend on the stage of development of the cyst. Hydatid cysts of the kidney may only be detected at the stage of complications, as in the case of our patient. Ultrasound can guide the diagnosis in more than half of cases. In cases of doubt, computed tomography and magnetic resonance imaging remain useful. The standard treatment for hydatid cysts of the kidney is resection of the protruding dome; a nephrectomy is indicated if the kidney is destroyed. Perioperative medical treatment is still indicated to avoid intraoperative and postoperative complications.

Keywords: Isolated renal hydatid cyst; complication due to a rupture in the renal capsule; Large kidney cyst measuring 20 cm.

INTRODUCTION

Parasitic infections of the upper urinary tract are relatively rare. Few parasites have a renal tropism. Echinococcus [E.] granulosis and Schistosoma [S.] haematobium are the two main parasitic infections that affect the kidney. Localization in the upper urinary tract is usually limited to young individuals. These infections are often detected late, sometimes at the stage of complications [1]. Patients with renal echinococcosis may present with nonspecific symptoms such as flank pain, a palpable abdominal mass, or hydatiduria [2,3]. Laboratory tests are only helpful if they are positive [1]. Diagnosis is based on imaging. The examination is based on a combination of ultrasound and CT scan. These two tests help to advance the diagnosis because the findings are quite suggestive. These tests also help to detect complications and establish an assessment of the damage caused by the disease [4]. Surgical excision is the standard treatment; approaches that preserve nephrons are preferable if they allow renal function to be preserved [2]. Albendazole is administered before surgery to inactivate the cyst and reduce the risk of anaphylaxis [5]. We report a case of an isolated left renal hydatid cyst complicated by rupture in the renal lodge in a 47-year-old woman and discuss its clinical presentation, imaging characteristics [with radiological classification], and surgical management. Our case highlights the clinical atypicalities of renal hydatid cyst presentation, which is often revealed at the stage of complications.

CLINICAL CASE

The patient is Mrs I.F., aged 47, in fairly good general health, with type 2 diabetes treated with oral antidiabetic medication and hypertension treated with calcium channel blockers. She lives in the city of Agadir and has no contact with livestock or dogs. For the past two years, she has been experiencing pain in her left lumbar region, without radiation, which is crushing in nature and of moderate intensity. The pain is partially relieved by analgesic treatment and aggravated by lying on her left side, accompanied by a feeling of heaviness. The condition is marked by worsening pain, without fever or deterioration in her general condition.

Physical examination revealed tenderness in the left flank with a palpable mass that was resistant and painful on deep palpation. Laboratory tests were normal, with no hypereosinophilia. Chest X-ray was normal.

The abdominal ultrasound revealed an ovoid cystic formation measuring 15 × 7 cm, mainly at the lower pole of the left kidney, with multiple septa. The abdominal-pelvic CT scan with contrast injection revealed the presence of a large left mid-renal mass, posterior, extending towards the lower and upper poles, well-defined, with a thin wall, enhanced after injection, with multivesicular cystic content, ruptured at its lower pole with some vesicles escaping into the renal lodge. It measures 17 × 8.5 × 10 cm [cranial-caudal × transverse × anteroposterior]. [Figure 1] In summary, the imaging was consistent with a type III Gharbi multivesicular hydatid cyst.

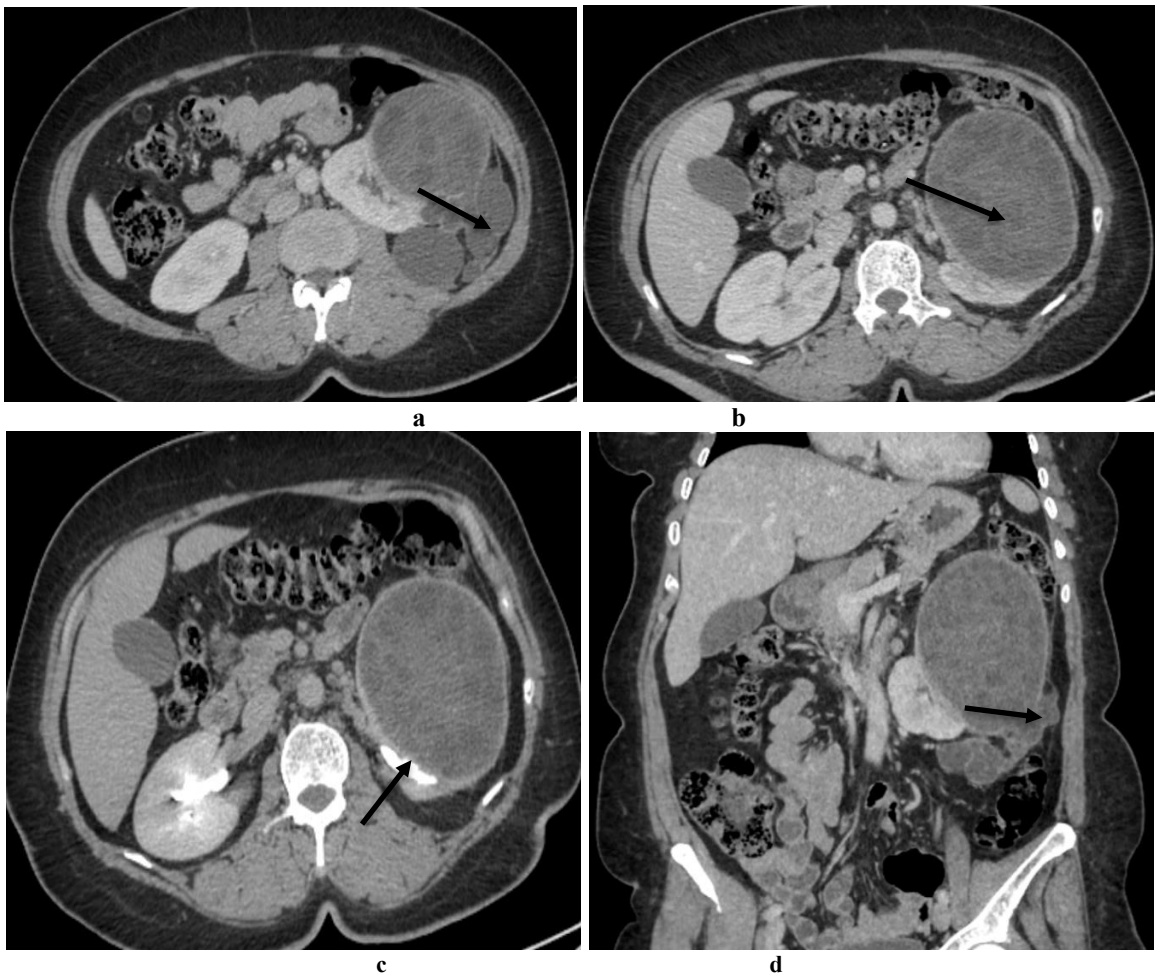


Figure 1: Abdominal-pelvic CT scan without and with contrast injection.
a. Axial slice C+ showing daughter vesicles with communication between cysts.
b. Axial slice C+ showing the large main cyst.
c. Late-phase axial slice showing the absence of communication between the cyst and the excretory ducts
d. Coronal slice C+ showing communication between the large cyst and the other small cysts

The patient received albendazole [400 mg twice daily] for one month. Conservative surgery was performed in the form of a left lumbotomy, allowing extraperitoneal access and avoiding the risk of spreading to the peritoneal cavity. After lumbotomy, the renal space was exposed directly, requiring initial sterilization of the cyst. Sixty ml of a scolicidal solution based on diluted hydrogen peroxide was injected intracystically while aspirating the same amount of fluid to avoid the risk of cyst rupture or the passage of hydatid fluid into the systemic circulation. Secondarily, the surgical field was protected with gauze pads soaked in diluted hydrogen peroxide to create a scolicidal barrier and prevent any spillage. Exploration of the retroperitoneum revealed the presence of fibro-inflammatory adhesions with neighboring organs and the absence of a cleavage plane. Resection of the protruding dome was the only feasible option for evacuating the intra-cystic daughter vesicles [Figure 2]. Subsequent exploration revealed several communicating cysts, requiring careful incision of the renal capsule from the lower pole to the upper pole. Diluted hydrogen peroxide was left in the retroperitoneum for 10 minutes for optimal washing, then aspirated with saline solution. A 24 Charrière chest drain was left in place to allow for washing with 10% povidone-iodine on postoperative days 1 and 2. The drain was removed on postoperative day 3, and the patient was discharged on postoperative day 4 after satisfactory clinical and biological checks.

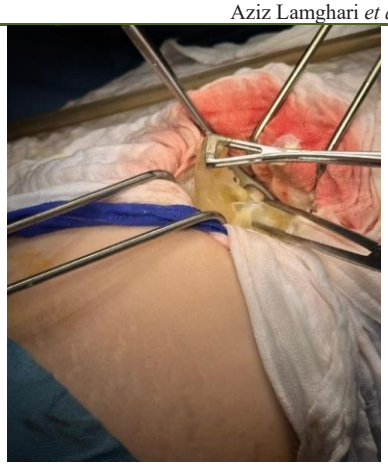


Figure 2: Left lumbotomy allowing resection of the protruding dome

Macroscopic examination of the specimens confirmed the presence of multiple daughter vesicles and laminated membranes consistent with hydatid disease [Fig. 3].

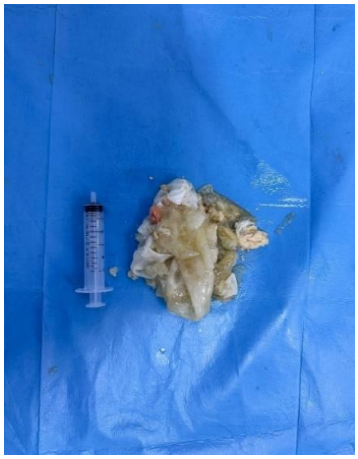
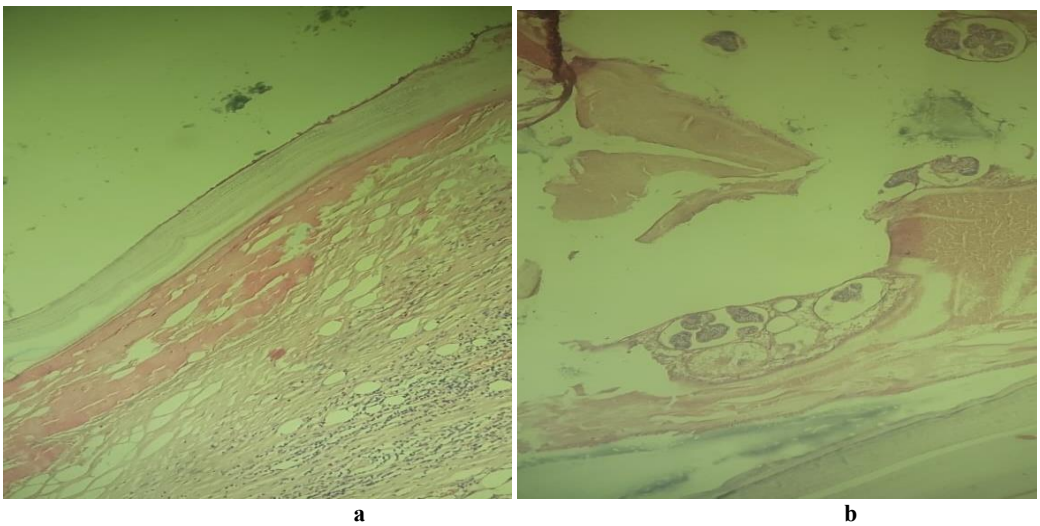


Figure 3: Multiple daughter vesicles with laminated membranes

Histopathology of the sample revealed a typical cyst wall composed of a thick, eosinophilic, acellular cuticular membrane with a concentric lamellar structure. The cyst lumen consists of numerous protoscolex with the presence of numerous daughter vesicles [Figures 4]



a **b**

Figure 4: Microscopic view of a pathological sample of kidney tissue showing the three structural components of the cyst wall: a. External acellular laminated membrane [1 mm thick]; germinal membrane [transparent nucleated lining] b. Protoscolices, attached to the membrane and budding from it

Follow-up ultrasounds performed at 1 and 3 months showed normal renal architecture with no recurrence.

DISCUSSION

Hydatid disease is an anthropozoonosis caused by the development in humans of the larval form of the tapeworm Echinococcus granulosus. Renal localization is rare, ranking third after hepatic and pulmonary localization, and accounts for 2 to 3% of all hydatid localizations [4-6]. Its clinical symptoms are varied but rarely specific.

The pathophysiology involves the ingestion of Echinococcus eggs, which hatch into oncospheres that circulate in the blood. Most remain trapped in the hepatic or pulmonary capillaries; those that escape can lodge in systemic organs. In the case of renal infection, it is believed that the embryos pass through the hepatic and pulmonary filters to reach the renal circulation [8] [9]. Once in the kidney, a single cyst usually forms in the cortex. Growth is slow [~1 cm/year], so cysts can remain asymptomatic for many years [10]. Eventually, symptoms such as flank discomfort, a palpable mass, or hematuria may prompt evaluation. Hydatiduria is pathognomonic, but occurs in only 10 to 20% of renal cases [2]; it was absent in our patient.

The silent clinical course and nonspecific symptoms promote disease progression, and in extreme cases, associated renal failure may be the telltale sign [12]. Early diagnosis of renal echinococcosis can best be established using imaging [15]. Ultrasound plays a crucial role in diagnosis as well as in monitoring and evaluating response to treatment [13,15]. As in our case, ultrasound shows an ovoid cystic formation measuring 15 × 7 cm in the lower pole of the left kidney, with multiple septa [13]. Computed tomography is appropriate for detailed anatomical representation and visualization of the cyst wall or septal calcifications and complications [13]. The cyst wall and septa show high attenuation on non-contrast CT and may or may not show enhancement after contrast injection [13]. Contrast-enhanced CT is useful for differentiating renal hydatid cysts from other benign lesions, such as simple renal cysts and abscesses, and malignant lesions, and for scanning other organs in a single pass [11] [13]. Polymerase chain reaction [PCR] testing is useful for the direct diagnosis of hydatid disease, including specific antigens of E. granulosus [14].

Treatment options for hydatid cysts of the kidney include medical management, percutaneous procedures, and open or minimally invasive surgery [16]. Surgery is the main treatment method and may involve complete removal of the cyst with perikystectomy or partial or total nephrectomy, depending on the extent of the disease and damage to the remaining functional parenchyma [17,18]. In our case, the renal cyst was complicated by a rupture in the renal capsule without involvement of the excretory tract. A cystectomy with preservation of the renal parenchyma was performed. Every possible precaution was taken to prevent the contents of the cyst from spilling out, which could lead to recurrence, spread, or the development of severe anaphylactic shock. Drug treatment is used prophylactically during the perioperative period to prevent the spread of cyst contents through intraoperative spillage [16]. The recommended treatment includes one month of pre- and post-operative treatment with albendazole, which can be continued for up to six months [18,15]. Our patient first received albendazole before the operation and continued treatment after the operation. Even after successful treatment of a hydatid cyst, follow-up with ultrasound or computed tomography is recommended, as there is always a risk of recurrence [16].

CONCLUSION

Hydatid cysts are rare in clinical practice and remain difficult to diagnose. Good imaging combined with clinical presentation can be helpful. In endemic areas, it should not be overlooked in the differential diagnosis of cystic renal masses, in order to ensure early diagnosis and appropriate management. Renal hydatid cysts are benign conditions that are merely biological errors in humans and require only simple treatment, which in this case involves resection of the protruding dome while preserving the renal parenchyma.

Declarations

Ethics approval and consent to participate

All authors equally contributed to the analysis and writing of the manuscript.

Consent for publication

Informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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