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Isolated renal hydatid cyst in a ten-year-old female child: A rare case report

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ABSTRACT

Hydatid cyst is a zoonotic disease caused by CestodaEchinococcus, especially Echinococcus granulosus. Isolated renal hydatidosis is an extremely rare clinical condition associated with nonspecific symptoms and physical findings. Diagnosis can be difficult and depends on imaging findings and histologic examination of excised tissue specimens.

Here, we report a case of an isolated right renal hydatid cyst in a 10-year-old girl who presented with progressively worsening right flank pain. Diagnosis was established using multimodal imaging after which she underwent a successful cystectomy, had a smooth post-operative course, and was discharged with improvement and a continuation of albendazole.

1. Introduction

Hydatidosis is a parasitic zoonotic disease caused by *Echinococcus granulosus* or *Echinococcus multilocularis* and affects humans as accidental hosts.[1,2] The most common organs involved in hydatidosis are the liver and the lungs.[2,3] Kidney involvement is rare, occurring in only 2–4% of all cases, mostly in the form of a single cyst at the level of the renal cortex.[2–5] Symptoms vary depending on the size, extent, and location of the cyst. Patients can be asymptomatic for a long period of time or have nonspecific symptoms such as hematuria, vague flank or lower abdominal pain, or a palpable lump.[4] Hydatiduria, caused by cyst rupture into the collecting system, is a pathognomonic finding observed in 10–20% of the patients and can cause colicky pain5.

Renal hydatid cyst can mimic other renal pathologies due to its morphological similarity.[5] Diagnosis can usually be made with imaging tests, namely ultrasound (US), computed tomography (CT), or nuclear magnetic resonance (NMR), in combination with serologic tests.[6] US and CT are commonly used imaging modalities, with contrast-enhanced (CE) CT needed to rule out competing differential diagnoses.[2] The gold standard treatment of the disease is surgical removal of the cyst in combination with antiparasitic drugs. Drug therapy alone has been described as an alternative to surgery for renal hydatid cysts, with good results in terms of reducing cyst size and cyst volume when surgery is refused or may be complicated.[4]

2. Case history

A 10-year-old female child presented to our hospital with a one-month history of right flank pain that was progressively worsening. She had no history of urinary complaints, fever, or trauma. On physical examination, she had stable vital signs, with the only relevant finding being right costovertebral angle tenderness without palpable swelling. Urinalysis was normal and renal function test was nonrevealing with a normal creatinine level of 0.6 mg/dl.

Abdomen and pelvis US was requested for further diagnostic workup which showed a 4.6 × 4.2 × 3.9 cm right renal mid-pole cystic mass with internal floating debris and double wall showing anterior wall detachment (Fig. 1).

CECT visualized the cyst in detail, suggesting a complicated isolated right renal cyst (Fig. 2). The remaining abdominal and pelvic organs show normal CECT findings. Chest x-ray showed no lung lesions.

Based on her clinical presentation and the typical imaging findings, a diagnosis of a right renal hydatid cyst was made and surgery was planned. The abdomen was entered through an anterior subcostal incision to access the retroperitoneum and the wall of the hydatid cyst was visible on the surface of the kidney. It was located in the upper and middle pole and had a size of 5 × 4 × 4 cm. The pericyst was opened and

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Abbreviations

CECT	Contrast enhanced CT
CT	Computed Tomography
US	Ultrasound

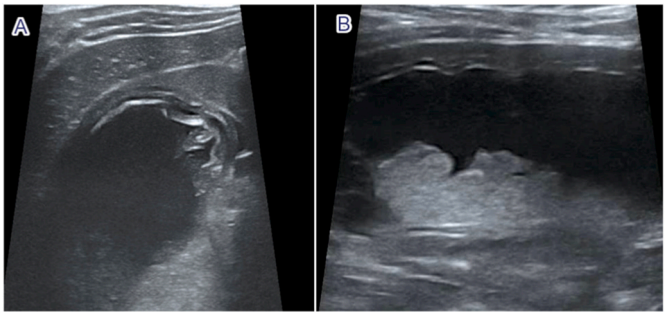

Fig. 1. Transverse (A) and longitudinal (B) ultrasound scan of the right kidney showing a double-walled cystic renal lesion.

the cyst mobilized circumferentially, after packing the surrounding tissue to prevent cystic fluid overflowing. There was rupture and spillage which was contained within the pack. The cyst was aspirated and mobilization of the cyst was completed and removed (Fig. 3). The patient was clinically stable throughout her postoperative course and was discharged on albendazole therapy. A follow-up ultrasound examination made three months after the operation showed no recurrence.

3. Discussion

A hydatid cyst, the larval stage of *Echinococcus*, is caused by the development of oncospheres of an *Echninoccus* tapeworm in a specific organ or tissue.[5] Cystic echinococcosis is found in most pastoral and rangeland areas of the world.[3,5] There is currently limited data on the prevalence of human cystic echinococosis in Ethiopia as the disease is not considered a significant medical condition and is not a notifiable disease.[6] Studies from different parts of Ethiopia have given an estimated incidence rate of the disease between 0.5 and 2.3%, with the liver being most affected (82%), while the spleen and kidneys being least affected (11 and 7% respectively).[6]

In general, renal localization of hydatid cysts is rare and only 2% of cases are children.[3,7] Most cases are unilateral (85%) and often located in the upper pole (37% of reported cases).[3,5] Isolated renal hydatid cyst is even rarer and is difficult to differentiate from other renal lesions. A diagnosis is difficult to make; sometimes a suspicion only arises during surgery, and pathologic confirmation completes the diagnosis.[3,8,9]

The silent clinical course and non-specific symptoms favor the disease progression and in the worst case associated renal dysfunction and even complete loss of function can be the presenting feature.[3] Early diagnosis of renal echinococcosis can best be made using imaging.[10] The US plays a crucial role in diagnosis as well as follow-up and assessment of treatment response.[5,10] As shown in our patient, US findings include anechoic cystic lesions with usually well-defined borders and double echogenic lines of the cyst wall and floating membranes.[5] CT is suitable for detailed anatomical depiction and visualization of cyst wall or septal calcifications and complications.[5] The cyst wall and septations show high attenuation on non-contrast CT and may or may not show contrast enhancement.[5] CECT is useful to differentiate hydatid renal cysts from other benign lesions, such as simple renal cysts and abscesses, and malignant lesions, and to scan other organs in a single pass.[2,5] Even if it is not available in most of resource limited settings Polymerase Chain Reaction [PCR] study is helpful in direct diagnosis of hydatidosis including specific E. granulosus antigens.[6]

Treatment modalities for renal hydatid cysts include medical management, percutaneous procedures, and surgical intervention using open or minimally invasive approaches.[9] Surgical intervention is the main method of treatment and can take the form of complete removal of the cyst with pericystectomy or partial or complete nephrectomy, depending on the involvement and damage of the remaining functional

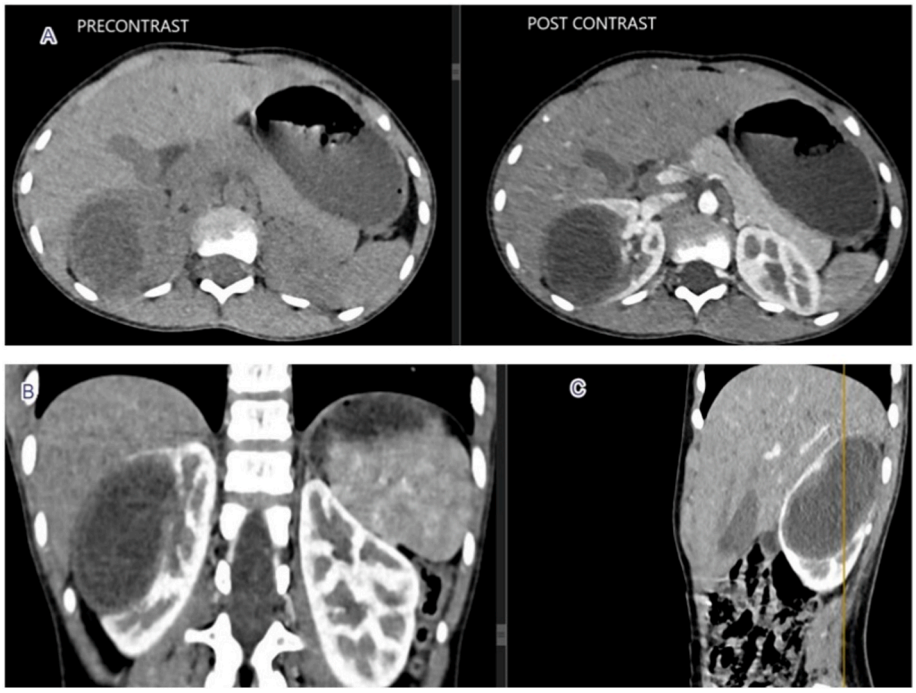

Fig. 2. An axial CT scan of the abdomen before and after contrast (A) at the level of the kidneys shows a cystic lesion in the midpole of the right kidney. Postcontrast coronal (B) and sagittal (C) reformations confirm similar findings.

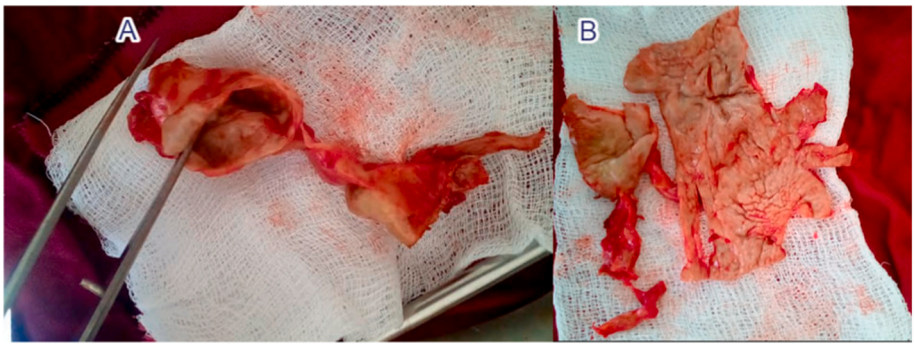

Fig. 3. Photo of a surgical specimen of the excised renal hydatid cyst (A), fully opened to show the internal structure (B).

parenchyma.[1,4] In our case, the cyst was superficial with minimal involvement of the renal parenchyma and pericystectomy was sufficient. Every possible precaution has been taken to avoid spilling the contents in to the peritoneum, which could lead to recurrence, spread or development of severe anaphylactic shock. Drug treatment is used prophylactically in the perioperative period to prevent spread of cyst contents through intraoperative spillage.[9] Recommended therapy includes one-month pre- and post-operative albendazole treatments, which can be continued for up to six months.[4,10] Our patient initially received albendazole preoperatively and continued the treatment post-operatively. Even after successful treatment of a hydatid cyst, follow-up imaging using US or CT is recommended, as there is still a risk of recurrence.[9]

4. Conclusion

Renal hydatid cysts are rare in clinical practice and difficult to diagnose, although multimodality imaging combined with clinical suspicion can be helpful. It should be considered in the differential diagnosis of cystic renal masses in children from endemic areas to make a timely diagnosis and plan proper management. Although rare, correct preoperative diagnosis is essential to optimize medical management prior to surgery, to follow proper surgical techniques, and to avoid aggressive mismanagement.

Authors' contributions

All authors contributed to the conduct of this research and read and approved the final version of the manuscript.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Written informed consent was obtained from the patient's parents for anonymized patient information to be published in this article.

Availability of data and materials

The data supporting the findings of the case are available upon request to the corresponding author.

Declaration of conflicting interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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