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The Kidney as an Unusual Host: Imaging Features of a Complicated Renal Hydatid Cyst in a Child

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ABSTRACT

Renal hydatid cysts are a rare manifestation of cystic echinococcosis in children and may present with nonspecific symptoms such as fever or flank pain. We report a 7-year-old child with prolonged contact with dogs who underwent abdominal imaging for febrile symptoms. Ultrasound revealed a well-defined cystic lesion in the upper and mid-pole of the right kidney with a thickened echogenic wall, internal septations, mobile echoes, and debris, suggestive of a complicated hydatid cyst. Contrast-enhanced CT confirmed a large cortical and parapelvic cyst with a hyperdense non-enhancing wall, fluid-density content, perirenal fat stranding, and an adjacent encysted fluid collection along the ipsilateral psoas muscle. This case highlights the complementary roles of ultrasound and CT in diagnosing renal hydatid disease, particularly superinfected cysts in pediatric patients from endemic regions.

KEYWORDS :

Renal hydatid cyst, Cystic echinococcosis, Pediatric hydatid disease, Ultrasound, Computed tomography

MAIN ARTICLE

INTRODUCTION

Cystic echinococcosis, caused by *Echinococcus granulosus*, remains a significant public health concern in endemic regions. Humans become accidental intermediate hosts through ingestion of parasite eggs, most commonly via contact with infected dogs. The liver and lungs are most frequently affected, while renal involvement is rare, accounting for approximately 2–4% of cases [1,2].

Renal hydatid disease is diagnostically challenging because it may mimic other cystic renal lesions. Imaging, particularly ultrasound and computed tomography (CT), plays a central role in diagnosis, characterization, and assessment of complications. We report a pediatric case of a complicated renal hydatid cyst, emphasizing the complementary value of ultrasound and CT imaging.

PATIENT AND OBSERVATION

Patient Information

A 7-year-old child presented with fever in a context of close and prolonged contact with dogs. Physical examination was unremarkable. Given the epidemiological background and persistent symptoms, abdominal imaging was performed.

Ultrasound Findings

Abdominal ultrasound revealed a **well-circumscribed cystic lesion in the upper and mid-pole of the right kidney** with regular contours and a **thickened, hyperechoic wall**. The cyst contained heterogeneous fluid with **internal septations, mobile echoes, and echogenic debris**, suggestive of a complex cystic lesion (Figure 1A and B).

These sonographic features were highly suggestive of hydatid disease, particularly in the endemic context. The presence of internal echoes and septations raised suspicion for a complicated or infected hydatid cyst, consistent with advanced stages in the Gharbi and WHO ultrasound classifications [3,4].

CT-scan Findings

The right kidney was enlarged with contour distortion due to a voluminous cystic lesion, while corticomedullary differentiation was preserved. A **large right cystic mass** involving the upper and mid-pole was identified (Figures 2 and 3). The lesion was round, well-defined, with regular margins. The **wall** was thickened, spontaneously hyperdense, non-enhancing

after contrast. The **content** was homogeneous fluid density. **Associated findings** were perirenal fat stranding (Figure 4A and B) and an **adjacent encysted fluid collection** lateral to the ipsilateral psoas muscle, extending along the posterior peritoneal layer (Figure 5).

DISCUSSION

Epidemiology

Hydatid disease is endemic in regions with sheep and cattle farming, including the Middle East, North Africa, South America, and parts of Asia. Humans are accidental intermediate hosts, infected by ingestion of parasite eggs shed by canines. Renal involvement is rare (2–4%), making the kidney the third most commonly affected organ after liver and lungs [1,2].

Clinical Presentation and Variability

Renal hydatid cysts often remain asymptomatic for years due to slow growth. Clinical manifestations are nonspecific, including flank pain, hematuria, abdominal mass, or, in complicated cases, fever and urinary tract infections. The variability in presentation depends on cyst size, location, and the presence of complications such as rupture, infection, or compression of the collecting system [2,3]. Our patient presented with fever, consistent with superinfection of the cyst.

Imaging Modalities and Their Relative Advantages

Ultrasound is the first-line imaging modality, particularly in pediatric populations. It allows rapid identification of cystic lesions and may reveal characteristic features such as daughter cysts, floating membranes, internal septations, or hydatid sand. In complicated cysts, internal echoes and debris can dominate, sometimes mimicking abscesses or complex cystic tumors [4].

CT provides superior spatial resolution and comprehensive anatomical evaluation. It enables precise characterization of cyst size, wall thickness, attenuation, and relation to surrounding structures. CT is particularly valuable in identifying complications, such as superinfection, perirenal fat infiltration, or secondary cysts, and plays a critical role in preoperative planning [4,5]. In our case, CT confirmed a large cortical and parapelvic cyst with thickened hyperdense walls and perirenal stranding.

Treatment Options and Outcomes

Management of renal hydatid cysts is primarily surgical. Kidney-sparing procedures, including cyst excision or partial nephrectomy, are preferred when feasible. Total nephrectomy is reserved for extensive parenchymal destruction or nonfunctioning kidneys. Medical therapy with albendazole is used adjunctively to reduce recurrence risk and prevent

dissemination, particularly in complicated or inoperable cases [4,6]. Outcomes are generally favorable when diagnosis is timely.

Differential Diagnosis

Complex renal cystic lesions in children include complicated simple renal cysts, renal abscesses, multilocular cystic nephroma, and cystic variants of Wilms tumor. Distinguishing hydatid cysts relies on a combination of epidemiological risk factors, imaging features, and serological tests where available. Features such as internal septations, membranes, and perirenal fluid collections favor hydatid disease over neoplastic or purely inflammatory cysts [3,7,8].

CONCLUSION

Renal hydatid disease is a rare but important consideration in pediatric patients presenting with complex renal cysts, particularly in endemic areas or with a history of canine exposure. Clinical presentation is variable and often nonspecific, with fever or flank pain suggesting complicated or superinfected cysts. Ultrasound is an essential first-line tool for initial detection, while CT provides detailed characterization, assesses complications, and guides surgical planning. Early recognition and a combination of surgical and medical management are critical to optimize outcomes and prevent recurrence. Radiologists play a central role in raising diagnostic suspicion and facilitating timely intervention of this rare entity.

FIGURES

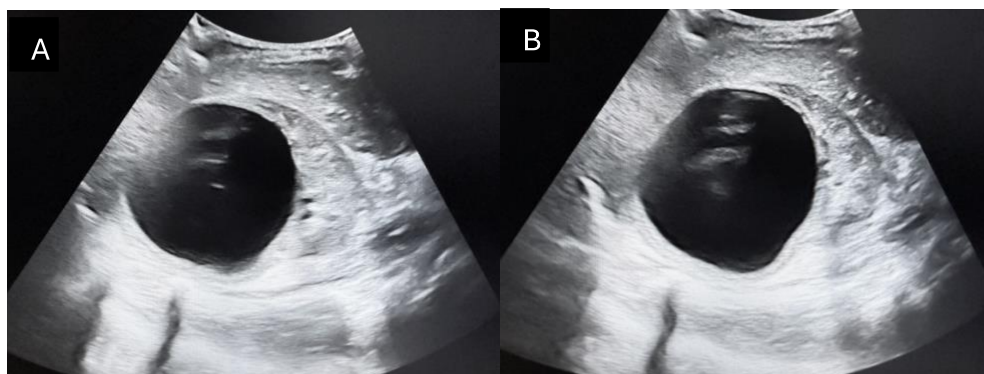

***Figure 1** : Abdominal ultrasound revealing a well-circumscribed cystic lesion in the upper and mid-pole of the right kidney with regular contours and a thickened, hyperechoic wall. The cyst contains heterogeneous fluid with internal septations, mobile echoes, and echogenic debris, suggestive of a complex cystic lesion.*

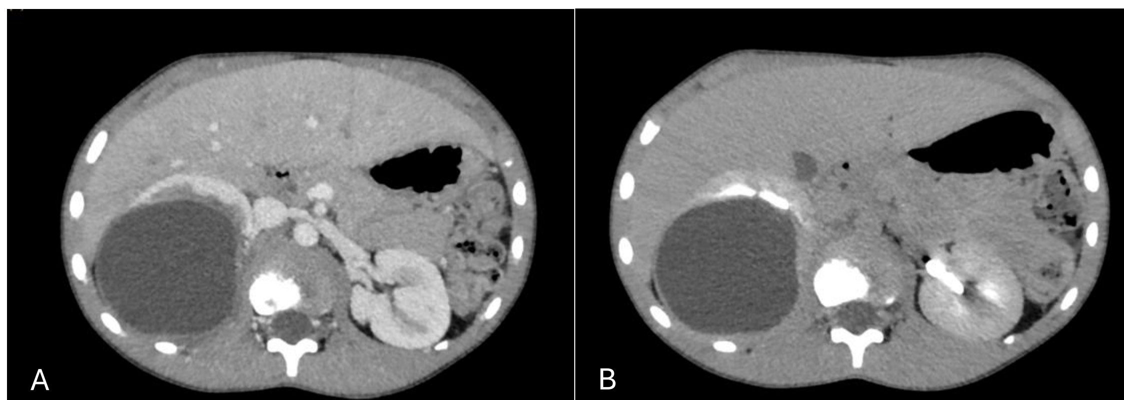

Figure 2*: Axial CT images of the abdomen in the excretory phase (A) and delayed phase (B) demonstrate a right renal cystic lesion with a thickened wall, no post-contrast enhancement, and homogeneous hypodense fluid content.*

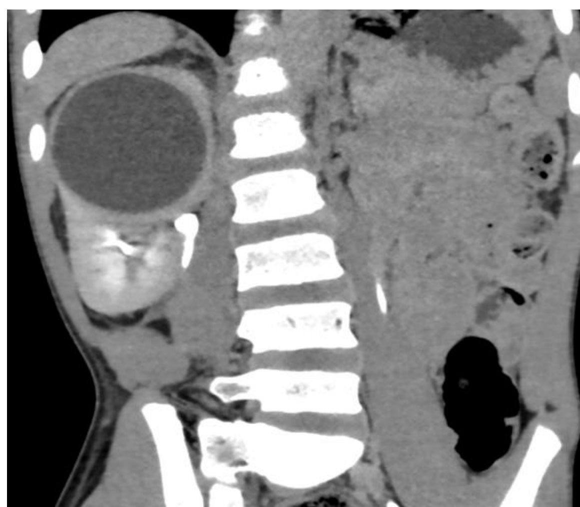

Figure 3*: Coronal delayed-phase CT of the abdomen showing a right renal cystic lesion with a thickened wall, homogeneous hypodense content, and no communication with the collecting system.*

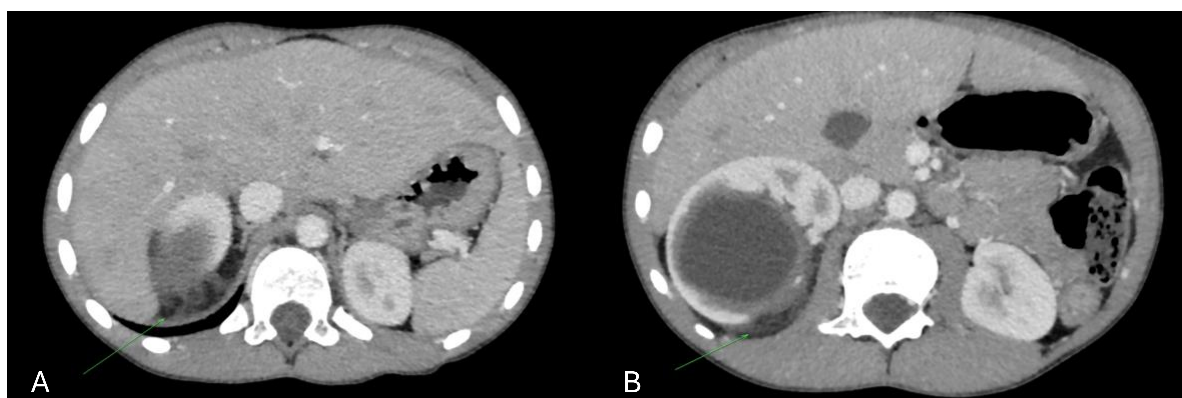

Figure 4 : *Axial CT in the excretory phase demonstrating perirenal fat stranding (A and B) around the right kidney.*

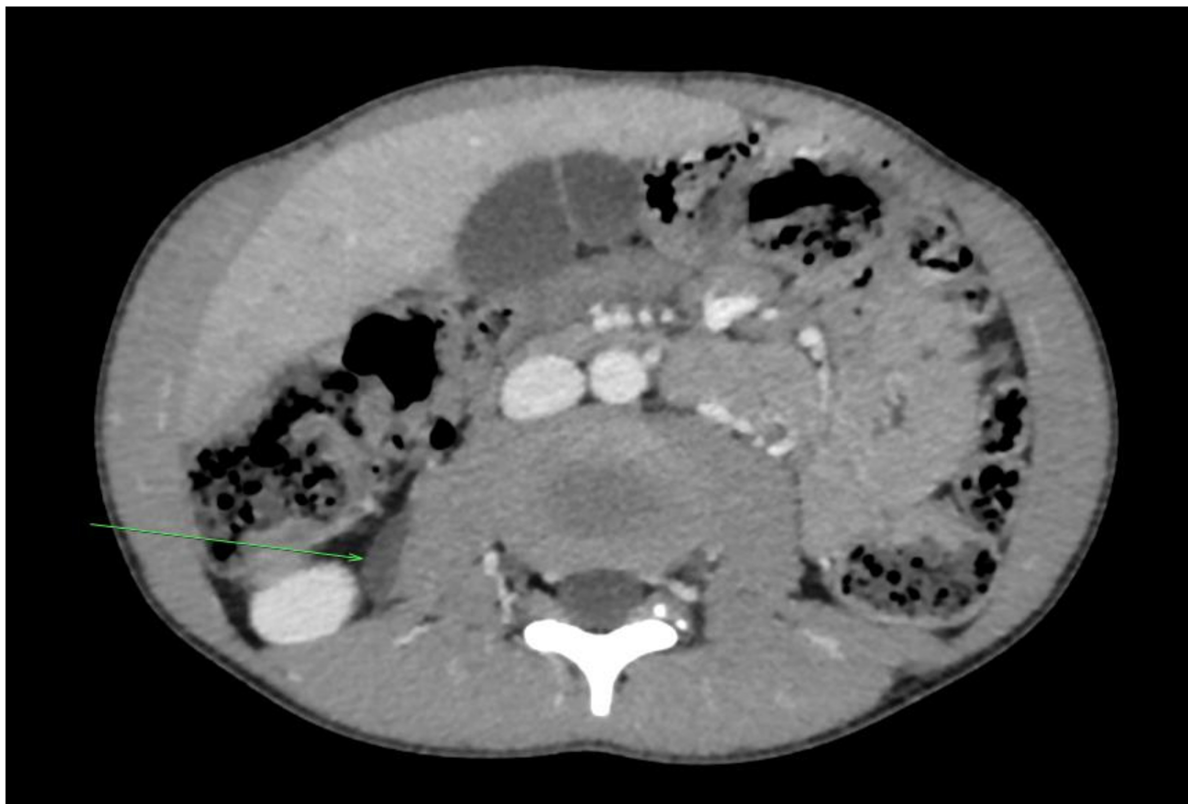

Figure 5 : *Axial CT scan in the excretory phase demonstrating a small fluid collection in the right reno–psoas space.*

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