Case Report

Renal hydatid cyst: A case report

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ABSTRACT

Hydatid disease is a parasitic infection commonly involving the liver, less frequently the lungs, and rarely the kidneys. Reports on renal hydatid disease are limited in literature. In this case study, we share a case of a 37-year-old female who presented with a 3-month history of left flank pain and following further evaluation with laboratory testing and radiological imaging was revealed to be a case of renal hydatid disease. The patient was successfully managed surgically with left total nephrectomy. The study will focus on the findings of renal hydatid disease in radiological imaging modalities.

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Introduction

Hydatid disease is a parasitic infection caused by the larval stage of the Echinococcus tapeworms. This cyst forming disease commonly involves the liver and less frequently the lungs with less than 4% total confirmed cases showing renal involvement [1]. The diagnosis can be reached through multiple imaging modalities including ultrasound imaging and computerized tomography (CT) [2] while the main treatment of choice is surgery [3]. Here, we present a case of a renal hydatid disease in a lady who presented to the urology services with left flank pain. The patient was eventually managed by total nephrectomy of the affected kidney.

Case report

Our case is a 37-year-old, medically free woman, referred from the urology clinic with a history of left sided flank pain for the past 3 months. At the time of her visit to the ER she was vitally stable, and her initial laboratory investigations were within normal limits. She underwent an ultrasound scan which showed a large cystic mass with multiple internal septations and lobulated margins, involving the lower pole of left kidney and measuring approximately 12.3 × 8.6 cm (Fig. 1). Contrast enhanced CT imaging of the abdomen and pelvis was performed for further characterization of the mass. The CT scan revealed the presence of a single, large, well-defined, thin walled, parapelvic complex cystic mass arising from the lower pole of the left kidney, measuring approximately 11.9 × 9.3 × 8.8 cm (CC x TR x AP) and showing thick septations, with no significant post-contrast enhancement. No solid nodules were seen within the lesion, nor was there any adjacent fat stranding or regional lymphadenopathy or other similar lesions. Both kidneys showed normal attenuation and enhancement, however the patient had mild left renal pelvic ectasia. Significant hydronephrosis and hydroureter were ruled out. The opacification of both renal arteries and veins was normal with no evidence of renal vein invasion or thrombosis (Fig. 2).

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The patient then underwent Echinococcus IgG antibody testing which came out positive. As a result, the patient was referred to the infectious diseases department, and she was started on Albendazole 400 mg twice daily for a month.

Surgical management was then offered, however, the patient initially refused, only agreeing to do the surgery 3 months later. An MRI study was requested for surgical pre-planning which redemonstrated the previously seen large, well-defined, complex cystic lesion, arising from the lower pole of the left kidney. It was stable in size, measuring approximately 11.7 x 9.1 x 8.9 cm (CC x TR x AP). On the MR study, the lesion appeared heterogeneous on both T1W and T2W sequences. Multiple smaller peripherally located daughter cysts with internal septations were seen within the largest cyst, the largest of which measured 8.0 x 6.4 x 6.6 cm (CC x TR x AP), and appearing hyper-intense on T1W, possibly due to hemorrhagic or proteinaceous contents. No restriction of diffusion seen on DWI and ADC sequences. The lesion showed mild enhancement of its wall as well as the walls of the daughter cysts and the fine intervening septations on the post-contrast images. No enhancing solid component was noted, and as seen in previous studies, no adjacent fat stranding, regional lymphadenopathy or other similar lesions were noted. There was no evidence of renal vein invasion or thrombosis. Both kidneys again showed normal parenchymal signal intensity and enhancement with no significant hydroureret or hydronephrosis (Fig. 3).

Patient was managed with a left total nephrectomy, and there were no significant complications postoperatively or at the 1 month follow up. On her latest follow-up appointment, an ultrasound study was requested which showed an absent left kidney with an unremarkable left renal bed and no evidence of recurrence.

Discussion

The kidneys are a rare location to be targeted by hydatid disease, as it usually involved the liver and lungs. Renal hydatid
Fig. 3 – Multi-axial multi-sequential MRI of the abdomen scan re-demnistrated the previously seen large well-defined complex cystic lesion arising from the left renal lower pole. The lesion appeared heterogeneous on T2W sequence with multiple smaller peripherally located daughter cysts are noted (A). Post-contrast, the lesion showed mild enhancement of its wall as well as the walls of the daughter cysts and the fine intervening septae. No enhancing solid component is noted (B). No diffusion restriction noted (C).

cysts are seen in around 2%-4% of total cases [1]. Renal involvement is likely to be unilateral; however, cases of bilateral or grossly widespread disease were reported [4,5]. The diseases varying forms of presentation span a spectrum, from being asymptomatic for years [6], to a more severe disseminated type [4].

Radiology plays a significant role in both reaching the diagnosis and evaluating the extent of the disease’s progression. Plain radiographs may reveal a ring-shaped calcification at the region of the affected kidney [1]. Ultrasound is more sensitive as it can provide more information regarding the mass, including a more accurate estimation of the size of the mass, surface features, the presence of daughter cyst and other associated regional abnormalities [1,7]. According to Gharbi et al. classification system, hydatid cyst disease can be classified into 5 classes: Type 1 is well defined, anechoic cyst with thickened wall. Type 2 displays detachment of the germinative membranes. Type 3 includes multi-cystic multi-septated lesions. Type 4 shows heterogeneous, degenerated cyst with internal echoes. Type 5 involved calcification [2,8].

Limitations to the use of ultrasound include the low specificity in distinguishing hydatid disease in appearance between other lesions like necrosed tumors [9].

CT scan, on the other hand, remains a more accurate examination as it can accurately confirm the size and location of the lesion and any relation or involvement with neighboring tissue, this can be particularly helpful in the preoperative planning phase if surgical intervention is to be utilized in determining the parenchymal involvement of the cyst within the renal tissue [1,7,10]. CT imaging is useful due to the clear visualization of cystic lesions and calcification, which can appear thick, unilocular or multilocular heterogenous cyst or the presence of low-density daughter cysts [1,2,10].

Magnetic resonance imaging (MRI) also plays a role in diagnosis, however, the high cost of using this modality is its main limitation, especially with the possibility of reaching the diagnosis using less expensive ultrasound or CT imaging. The Findings on US and CT are comparable to those on MR imaging [1,11]. Hydatid fluid appears hypointense on T1W images, however it is hyperintense or heterogenous on T2W images with a surrounding hypointense rim. The daughter cysts fluid appearance can range from hypo to hyper intense as well. The collapsed parasitic membranes may appear as linear, internal, hypo intensities that enhance with contrast administration [2].

A common Immunological and serological finding in hydatid disease is the presence of eosinophilia in up to 50% of the cases [1]. Many different types of immunological tests may be utilized, however, the limitations in their specificity and sensitivity discourages their use [7,10].

Overall, while the synergy between imaging and laboratory investigations can aid in reaching the required diagno-
sis with high certainty. Common differential diagnosis for cases with similar presentation can include simple renal cysts, calcified hematomas, cystic nephroblastoma or a renal abscess [12].

The mainstay of treatment remains surgical intervention, as both medical management and interventional radiological procedures are limited in their effectiveness. Both laparotomy and laparoscopic approaches are utilized, the choice of the surgical technique depends on multiple factors including the size of the cyst, presence of invasion to nearby structures and the presence of multiple or extra renal cysts and the results of renal function testing. Recently, laparoscopic surgery is becoming more popular due to its higher safety margin while providing satisfactory results, it is especially used in cases with exclusive renal involvement [3].

Percutaneous drainage has also been described as a safe alternative to surgery [13], especially if the urinary collecting system is spared or preservation of renal tissue is required. It is important to note that there is evidence that dissemination of the disease remains a potential side effect in such cases [3].

**Conclusion**

Renal involvement in hydatid disease is considered a rare phenomenon in comparison to liver and lung involvement. Radiology plays a key role in both reaching an accurate diagnosis and providing support in the pre-surgical planning phase. Open or laparoscopic surgical intervention remains the gold standard in management, with conservative management and interventional radiological procedures offered in select cases.

**Patient Consent**

Written informed consent was obtained from the patient.

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