

Role of Imaging in the Diagnosis of Isolated Renal Echinococcosis: A Case Report

KALIDINDI VALLI MANASA¹, SATISH D PATIL², ANIL G JOSHI³



ABSTRACT

Echinococcosis is a parasitic infection caused by *Echinococcus* tapeworm. The most common organs involved are liver, lungs and spleen. Primary renal echinococcosis is a very rare manifestation of hydatid disease. Clinical manifestations in primary renal echinococcosis are variable and can have varied symptomatology which are non specific. A 62-year-old female patient presented with abdominal fullness since six months, palpable mass and left flank pain since three months. On imaging, a large multiloculated cyst and multiple peripherally situated daughter cysts involving the middle and lower pole of left kidney with gross dilatation of upper pole calyx with severe cortical thinning was noted. It usually presents as a cystic renal mass on imaging and often gets misdiagnosed and operated as a cystic renal malignancy. Hence, radiological imaging plays an important role and care should be taken when dealing with a cystic renal mass to avoid unnecessary nephrectomies.

Keywords: *Echinococcus* infection, Hydatid cyst, Kidneys, Nephrectomy

CASE REPORT

A 62-year-old female patient presented to Out Patient Department (OPD) with complaints of abdominal fullness since six months, palpable mass and left flank pain which was dull aching type since three months. On abdomen examination, there was a large non tender mass filling the left hypochondrium, left lumbar and umbilical regions which are firm in consistency and measuring approximately about 10×9 cm. No history of weight loss and cachexia. No evidence of significant lymphadenopathy. Systemic examination otherwise shows no significant abnormality. No significant family history noted.

On ultrasound abdomen, a thin-walled cystic lesion [Table/Fig-1,2] giving posterior acoustic enhancement measuring about 12×12 cm involving mid and lower pole of left kidney with multiple daughter cysts within giving 'cyst within cyst' appearance was noted [Table/Fig-2]. On colour doppler imaging, the cyst wall showed minimal vascularity [Table/Fig-3].

Non contrast computed tomography findings: Left kidney was enlarged in size with evidence of a large well defined thin walled multiloculated hypodense cystic lesion measuring about 12×10×12 cm with multiple daughter cysts and septations within giving 'Cart-Wheel appearance' causing architectural distortion was noted involving the middle and lower pole of left kidney [Table/Fig-4]. The lesion was causing expansion of the perinephric space and obliteration of anterior pararenal space, however posterior para-renal space was relatively preserved [Table/Fig-5,6]. No evidence of calcific foci noted within.

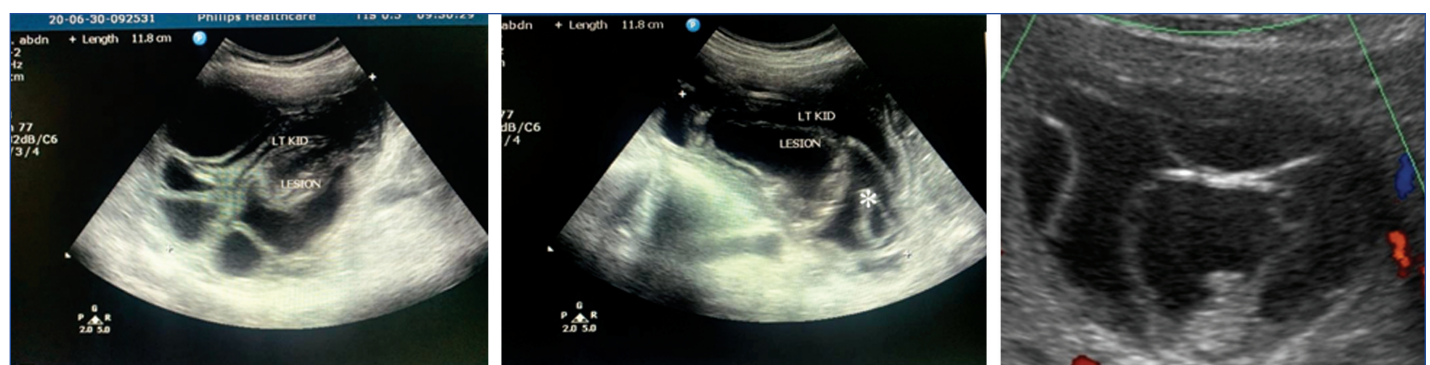
The mass was seen medially crossing the midline and displacing the aorta and Inferior Vena Cava (IVC), laterally it was displacing lateral conal and transversalis fascia, anteriorly the mass was seen displacing Gerota's fascia and parietal peritoneum, posteriorly displacing Zuckermandl's fascia, superiorly displacing body and tail of pancreas, splenic vessels, inferiorly it is seen displacing small bowel loops and descending colon.

Gross dilatation of upper pole of the calyx was noted with severe cortical thinning measuring about 5 mm. Sudden abrupt narrowing of the distal ureter was noted for a length of 1.5 cm causing gross hydroureter- possibly due to inflammatory stricture [Table/Fig-6].

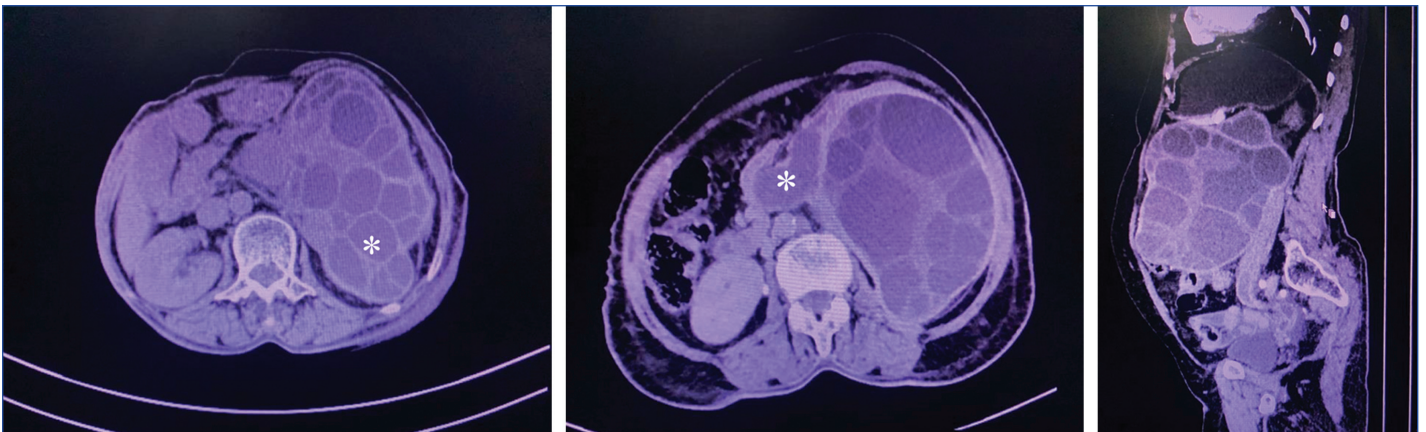
Contrast enhanced computed tomography findings: On postcontrast study, the lesion shows minimal enhancement of peripheral capsule and internal septations [Table/Fig-7-9]. Upper pole of left kidney shows excretion of contrast on delayed phases [Table/Fig-10].

A provisional diagnosis of 'Infective aetiology- likely Renal echinococcosis' was given with a possible differential to be considered as cystic renal malignancy.

Patient was put on bi-imidazoles 400 mg twice daily for four weeks duration as a measure to prevent spillage and anaphylaxis during surgery. Partial nephrectomy was performed, at which the cyst was removed en bloc. Patient was put-on three-month course of albendazole 200 mg twice daily and advised for a follow-up ultrasound after three months.



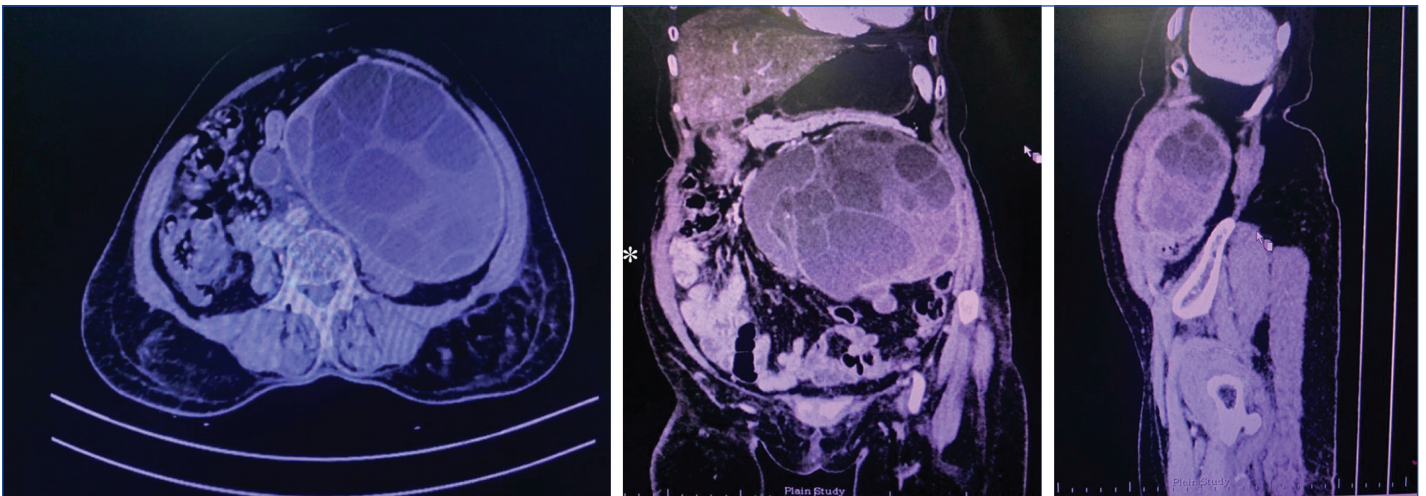
[Table/Fig-1]: Axial grey scale ultrasonography showing thin-walled complex cyst involving left kidney; [Table/Fig-2]: Sagittal grey scale ultrasound showing few floating membranes (*) within the complex cystic lesion and 'cyst within cyst' appearance; [Table/Fig-3]: Colour Doppler ultrasonography of the cyst showing minimal vascularity in its wall. (Images from left to right)



[Table/Fig-4]: Non enhanced CT axial section of the abdomen shows well defined multiloculated cystic lesion with multiple daughter cysts and septations within giving 'Cart-Wheel appearance' (*) involving mid and lower poles of left kidney.

[Table/Fig-5]: Non enhanced CT axial sections of the abdomen shows evidence of hydronephrosis (*) likely due to stricture secondary to inflammatory changes.

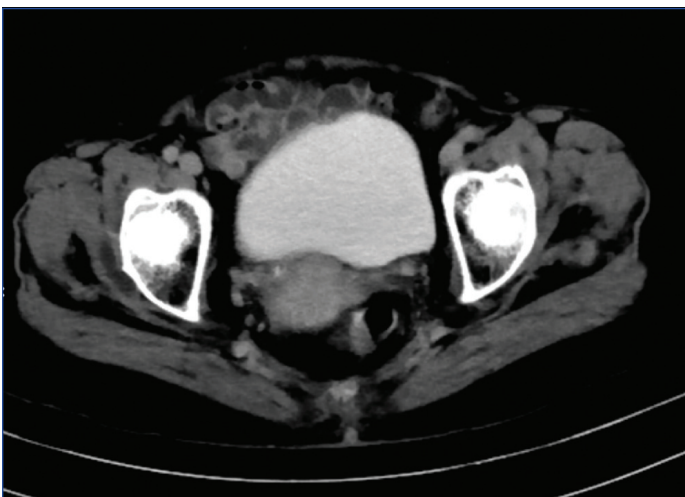
[Table/Fig-6]: Non enhanced CT sagittal sections of the abdomen shows the lesion causing expansion of the perinephric space and obliteration of anterior pararenal space. (Images from left to right)



[Table/Fig-7]: Contrast enhanced axial CT abdomen shows minimal enhancement of peripheral capsule and internal septations on post contrast study.

[Table/Fig-8]: Contrast enhanced coronal CT abdomen shows left hydronephrosis due to distal obstruction secondary to inflammatory ureteral stricture (*).

[Table/Fig-9]: Contrast enhanced sagittal CT abdomen shows enhancement of cyst wall more than internal septations. (Images from left to right)



[Table/Fig-10]: CECT abdomen showing excretion of contrast from the left renal system on delayed scan.

after two months and an ultrasound was done which was normal [Table/Fig-13].

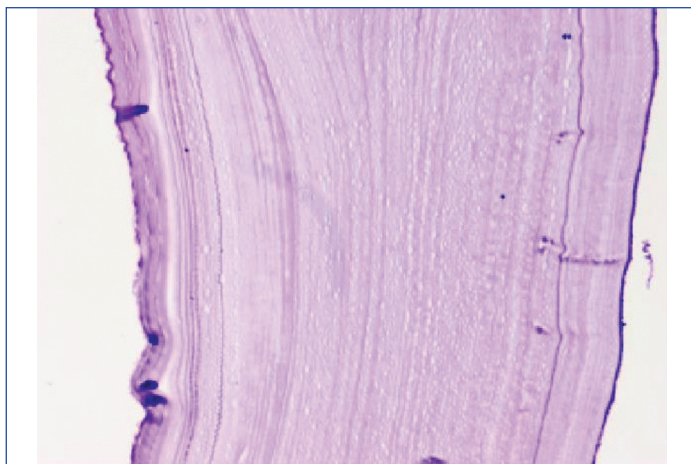


[Table/Fig-11]: Gross specimen showing multiple fluid filled daughter cysts.

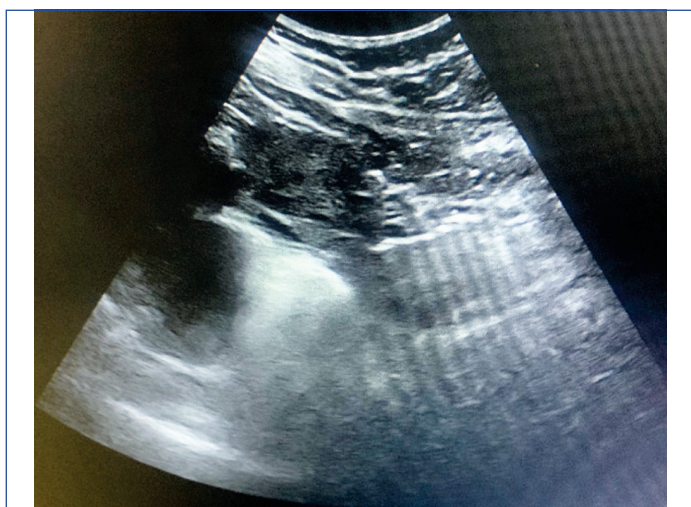
Gross specimen findings: Incised cystic mass with multiple smaller, smooth-walled daughter cysts, which were filled with translucent fluid [Table/Fig-11].

On histopathological examination cyst showed a thin inner germinal layer, middle laminated layer and an outer adventitial layer. Parasitic membranes were obvious in most examined sections, some were continuous and intact containing brood capsules with protoscolices [Table/Fig-12].

Hence, a final diagnosis of renal echinococcosis was made postoperative period was uneventful, and patient came for follow-up



[Table/Fig-12]: Histopathology image of the hydatid cyst wall consisting of an avascular, eosinophilic chitinous laminated membrane (H&E, 100X).



[Table/Fig-13]: Postoperative 2D ultrasonography showing normal left renal fossa with no significant postoperative complications/residual cysts/recurrence.

DISCUSSION

Primary renal hydatid disease is a zoonotic disease which is caused by ingestion of the parasitic eggs through contaminated food, water, soil, or through direct contact with animals. Parasite generally crosses duodenal mucosa and renal involvement occurs due to haematogenous spread. Renal hydatid does not show specific signs or symptoms and is very rarely involved compared to that of liver or spleen [1]. Patients present with non specific symptoms like palpable mass in case of large cysts, flank pain, hydatiduria, malaise, and fever [2]. In present study, patient presented with complaints of chronic left flank pain, palpable mass and fullness.

Serology plays a less important role in diagnosis of hydatid disease due to high false negative results [3]. Imaging plays an important and major role in diagnosing as well as staging of renal hydatid cyst. Ultrasound demonstrates large thin-walled cyst with multiple daughter cysts within giving 'cyst within cyst' appearance [4], floating membranes and hydatid sand. The Gharbi ultrasound classification of cystic echinococcosis [5] consists of five stages: homogeneously hypoechogenic cystic thin-walled lesion (stage 1), septated cystic lesion (stage 2), cystic lesion with daughter lesions (stage 3), pseudotumour lesion (stage 4) and calcified or partially calcified lesion -inactive cyst (stage 5). This lesion falls into stage 3 Gharbi ultrasound classification of cystic echinococcosis.

Computed tomogram is a more sensitive imaging modality to look for daughter cysts, calcifications, intracystic gas and for anatomical localisation. The CT demonstrates a large thin walled cystic lesion with multiple peripherally placed daughter cysts and septations within giving 'Cart-wheel appearance'. The lesion may show minimal enhancement of capsule and septations on postcontrast study [6].

In general, surgery is the treatment of choice for large renal hydatid cysts [7]. If a preoperative diagnosis of hydatid cyst is made, the surrounding area around the cyst must carefully be isolated by gauze packs, aspiration of the cyst must be done and the cystic fluid must be replaced with scolicidal agent. Another technique is called partial cysto-pericystectomy where the cyst along with the hydatid membrane and daughter cysts are removed with scolicide-soaked swabs [8]. Remnant pericystic margin is then sutured. Usually, nephrectomy must be reserved for a non functioning kidney only. So, in case of small cysts, focal or partial resection would be a better option. World Health Organisation (WHO) Informal Working Group on Echinococcosis (WHO-IWGE)-2010 classification system [5] based treatment is used for cystic echinococcosis infection. Active lesions need surgical intervention or Percutaneous Aspiration, Injection and Reaspiration (PAIR)+medical management due to risk of spread. However, PAIR is usually avoided due to risk of peritoneal seeding. Inactive lesions need monitoring. Surgical management includes extraperitoneal partial or total nephrectomy. Laparoscopic nephrectomy is avoided as it carries risk of cyst rupture and incomplete removal of the hydatid cyst.

Complete nephrectomy is reserved for non functioning kidneys. Medical management includes administration of albendazole (5-7 mg/kg twice daily) in combination with PAIR and is reserved for non operable cases. Preoperatively to make the cysts less tense three cycles of bi-imidazoles of four weeks duration two weeks apart should be given to prevent spillage and anaphylaxis. To prevent recurrences three months course of albendazole should be given postoperatively.

Few of the recent case reports published in the literature on isolated renal *Echinococcus* stress upon the possibility of isolated renal hydatid disease getting misdiagnosed and operated as cystic renal tumours [9], however most of these studies used a single imaging modality to describe its characteristics [10]. It is important to be familiar with the radiological signs and imaging features, which are clearly described in this case report using various modalities like ultrasound, colour Doppler imaging, non enhanced CT and contrast enhanced CT. All the typical features of renal hydatid disease like large multiloculated thin-walled cystic lesion with multiple daughter cysts giving 'cart-wheel appearance' and daughter cysts with low density content than the maternal matrix have been described in this case report. However, the limitation of this case report was, there was no Diethylenetriamine Pentaacetic Acid (DTPA) scan done prior to planning the partial nephrectomy to assess residual kidney function adequately.

Renal echinococcosis can mimic few cystic renal malignancies and there are reported cases of preoperative misdiagnosis especially in non endemic areas [11]. Hence, care should be taken while dealing with cystic renal lesions and avoid unnecessary nephrectomies.

CONCLUSION(S)

Primary renal echinococcosis is a very rare manifestation of hydatid disease, which presents as a cystic renal mass on imaging and often gets misdiagnosed and operated as a cystic renal malignancy. Hence, care should be taken and echinococcosis should be considered as a differential when dealing with a cystic renal mass to avoid unnecessary nephrectomies.

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