Case study

Renal Hydatid Cyst: A rarer site of infection

Abstract

Echinococcosis is a parasitic infection caused by the larval stage of a cestode Echinococcus granulosus. It manifests as hydatid cyst.

Infection is transferred through the oral-fecal pathway by eggs of the parasite. Hydatid cyst can be made in liver, lung and rarely in heart, breast, thyroid, soft tissue of neck and kidney. Herein, we present a case of hydatid cyst of kidney, a rare organ to get infected by Echinococcus granulosus.

Key words: Echinococcosis, Hydatid cyst, parasite, kidney.

Introduction

Echinococcosis or hydatid disease is a zoonotic parasitic disease caused by larval stage of cestode Echinococcus granulosus. The cysts are most commonly located in liver (75%) followed by lungs (15%) [1].

Hydatid involvement of the kidney accounts for only 2-4% of all cases of hydatid disease [2].

The gold standard therapy for the disease is surgical excision of the cyst combined with antiparasitics [3].

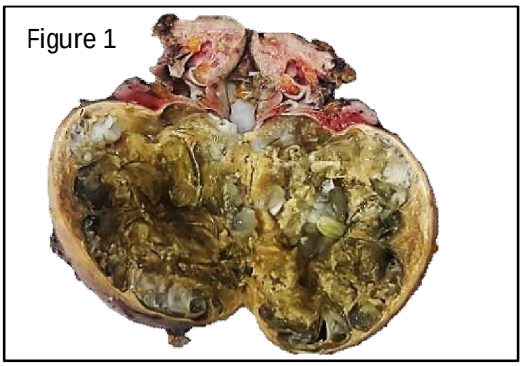
Case Report

A 42-year-old female complained of dull vague pain and heaviness in left flank, of seven months duration.

Radiology studies were suggestive of Hydatid cyst of left kidney along with dilated pelvicalyceal system and non-functional left kidney. Due to non-functional nature, complete nephrectomy was performed.

We received bosselated left nephrectomy (Figure 1) measuring 16 x 12 x 5 cms. The kidney proper measured 9 x 5 x 4 cms. Cut surface revealed a well demarcated, multicystic lesion involving lower pole of kidney measuring 13 x 12 x 5 cms containing multiple whitish to yellow smooth and gelatinous cysts that ranged from approximately 0.5 to 6.0 cm in diameter. Cysts contained translucent to yellowish fluid. There was no communication of cyst with pelvicalyceal system. No solid lesion was seen. The adjacent kidney was compressed, showing extremely dilated pelvicalyceal system, thinning of renal cortex, blurring of corticomedullary junction and differentiation. Ureteric stump measured 7.5cm in length and

was slightly dilated in its upper portion.Cyst fluid cytology revealing protoscolices [Figure 2].



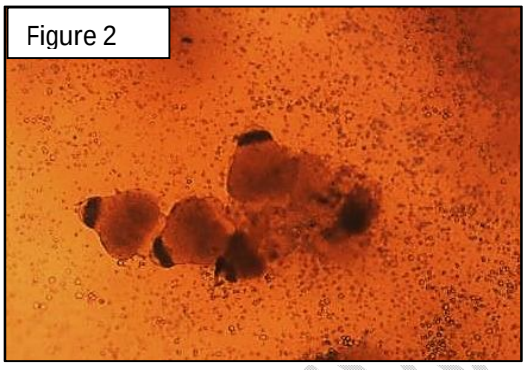


Figure 1: Gross: Kidney showing multicystic lesion involving lower pole of kidney and containing multiple whitish to yellow smooth and gelatinous inner daughter cysts.

Figure 2: Microscopy: Hydatid fluid cytology revealing protoscolices (Light microscopy wet preparation x400).

On histology, the cystic lesion was composed of three layers: outermost pericyst (Figure 3) being fibrous, middle ectocyst (Figure 4) layer formed by laminated, hyaline and acellular membrane and the inner endocyst (Figure 4, 5) showing germinative layer which consists of daughter cysts and brood capsules with protoscolices. Hydatid sand (Figure 6) comprised of degenerated protoscolices with hooklets and calcareous corpuscles. Surrounding kidney showed features of chronic pyelonephritis with atrophic tubules and markedly increased eosinophilic infiltrate (Figure 7).

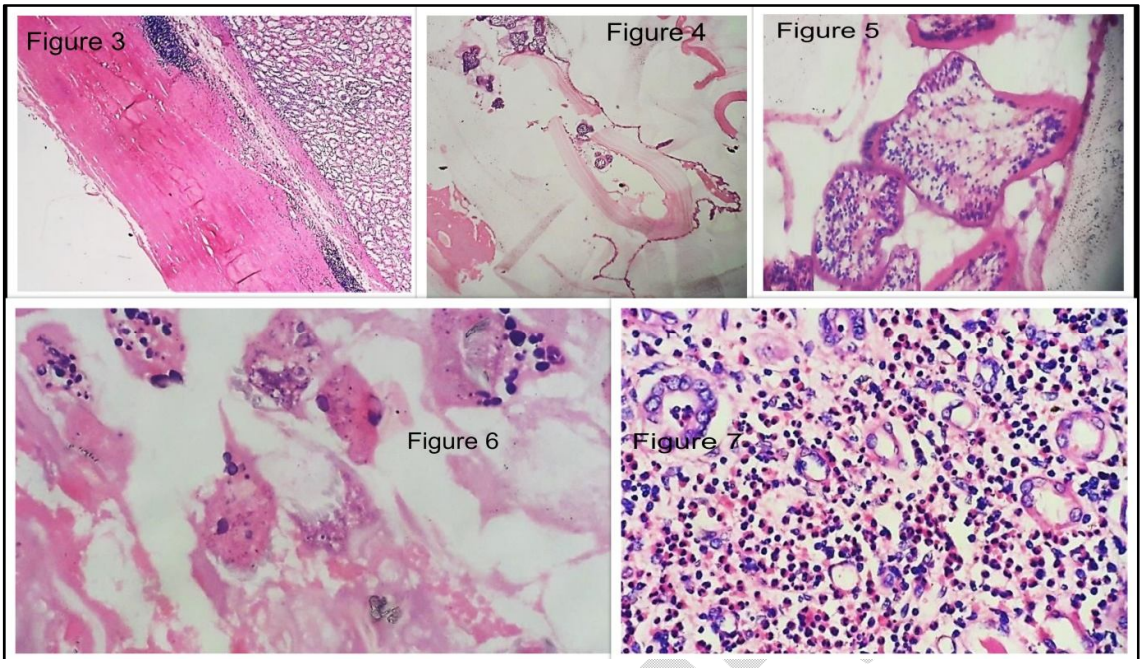


Figure 3: Microscopy: Outermost fibrous pericyst. Fibrous layer is the tissue reaction separating renal parenchyma from ectocyst (HE x100)

Figure 4: Microscopy: Middle layer of ectocyst laminated membrane and inner layer of endocyst (HE x100)

Figure 5: Microscopy: Endocyst with protoscolices (HE x400)

Figure 6: Microscopy: Hydatid sand with degenerated protoscolices, refractile hooklets and basophilic calcareous corpuscles (HE x100)

Figure 7: Microscopy: Adjacent renal parenchyma showing features of chronic pyelonephritis with dense eosinophilic infiltrate (HE x400)

The final diagnosis of Hydatid cyst of kidney with hydronephrosis and chronic pyelonephritis was offered. In the postoperative period, the patient was treated with albendazole and recovered well.

Discussion

The term "hydatid" came from the Greek word "hudatis," meaning watery vesicle. Cystic form of the Echinococcus larval stage has been well-recognized since ancient times. Rudolphi, in 1808, first used the term hydatid cyst to describe Echinococcus in humans. Hydatid disease is endemic in Mediterranean countries, the Middle East, South America, China, and India [4].

Echinococcosis or hydatid disease is a zoonotic parasitic disease caused by larval stage of cestode Echinococcus granulosus. Dog is the definitive hosts while sheep is the usual intermediate host. Humans are accidental intermediate dead end hosts infected through ingestion of parasite eggs in contaminated food, water or soil, or through direct contact with animal hosts. After gaining entry in gut the parasite larva penetrates the duodenal mucosa, reaches the blood stream, and seeds the liver and lungs commonly. The cysts are most commonly located in liver (75%) followed by lungs (15%) [1].

Hydatid involvement of the kidney accounts for only 2-4% of all cases of hydatid disease [2].

It is not clear how the hydatid embryo reaches the kidney in cases of primary hydatid disease but it is postulated that it must pass through the portal system into the liver and retroperitoneal lymphatics [5].

Symptoms vary depending on the size, extension, and location of the cyst. Patients may be asymptomatic for long periods of time or present with lower back pain, hematuria, or an abdominal lump. Hydatiduria, a pathognomonic presentation of the disease, is observed in only 10-20% of the patients when the cyst ruptures into the collecting system. Patients with the disease are diagnosed with imaging tests, namely ultrasound, computed tomography (CT), nuclear magnetic resonance (NMR). Additional workup may include ELISA or indirect hemagglutination assays to titer for specific antibodies, follow patients, and determine cases of recurring disease [3].

On imaging, a multiloculated cyst with daughter cyst(s) is diagnostic but unilocular cyst with a detached membrane is also suggestive of a hydatid cyst. In cases with noncharacteristic cystic lesion, the kidney may pose a diagnostic dilemma; double contour thick wall on ultrasonography or the presence of hydatid cyst in other organs favors the diagnosis [4].

The CT scan has an accuracy of 98% and sensitivity to demonstrate the daughter cysts. The CT scan usually demonstrates an expansile, hypo-attenuating tumor with a well-defined wall and daughter cysts within the parent cyst. The central cystic part of the lesion has an attenuation of 30-35 HU, in contrast to the much lower attenuation of the fluid in the surrounding cysts (5-15 HU), giving the mass a wheel-like or rosette appearance [5].

The hydatid cyst of the kidney is considered closed if all three layers of the cyst i.e. pericyst, ectocyst and endocyst are intact. When the cyst is no longer protected by the third layer i.e. pericyst or by the lining of collecting system it is considered to be an exposed cyst. If all the three layers of the cyst have ruptured resulting in free communication with the calyces and pelvis, it is called an open or communicating cyst [5].

Blutke et al described in their study hydatid sand revealing numerous free, partially evaginated protoscoleces, intact and ruptured brood capsules, calcareous corpuscles, necrotic protoscoleces, debris, and free rostellar hooklets [6].

The adjacent renal parenchyma often shows pressure atrophy and chronic pyelonephritic changes and an infiltrate in which eosinophils may be prominent. [7].

The gold standard therapy for the disease is surgical excision of the cyst combined with antiparasitics [3].

A variety of surgical options, ranging from marsupialization and pericystectomy to nephrectomy, are advocated. Laparocopic aspiration of the renal hydatid cyst has also been reported. Treatment with mebendazol or albendazole helps to prevent seeding [4].

Operation and using puncture, aspiration injection and re-aspiration (PAIR) are the most important and best treatment methods. According to the pressure on hydatid cyst, getting torn and the release of hydatid liquid containing protoscolex during the surgery are not unusual, and this issue is the most important cause of invasion in this disease, therefore applying scolicidals during the surgery is necessary [8].

Complete nephrectomy is reserved for destroyed nonfunctioning kidneys, opening into the draining system or other cavities and complicated by renal infection [1].

Conclusion

Hydatid cyst of kidney is a rare infection to have. The radiology and histology help in its diagnosis. The clinical manifestation being very vague, leads to late diagnosis of the disease, leading to renal damage. Hence, early diagnosis helps in functional renal preservation and thus leading to renal sparing surgeries.

References

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