

Case Report

Isolated Hydatid Cyst of Kidney: A Case Report

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Abstract:

Hydatid disease, caused by *Echinococcus granulosus* is still endemic in certain parts of world but not a common disease in our country. Hydatid cysts mainly involve the liver and lungs but any other organ can potentially be involved. Renal hydatid cyst is uncommon and represents 2-4% of hydatid cyst in human. We report a case of isolated hydatid cyst of right kidney in our surgical care. A 36 years old lady was admitted under our care with gradually increasing lump and mild pain in right lumbar region for 6 months. Ultrasonography revealed a diagnosis of hydatid cyst. IVU showed smooth filling defect in right kidney which displaced pelvicaliceal system. Serological tests were not done due to unavailability. The patient was operated on and endocystectomy, deroofting and marsupialization were done. Hydatid cyst was confirmed by histopathological examination. Albendazole was started 2 weeks before operation and continued postoperatively for 1 month. The patient was discharged on 8th postoperative day and was closely followed up for 3 years without any further development of hydatid cyst in any organ.

Key words : Hydatid cyst, Renal, Isolated, *Echinococcus granulosus*.

Introduction:

Hydatid cyst disease, or human cystic echinococcosis, is a zoonotic infection mainly caused by the larval forms of the tapeworm *Echinococcus granulosus*¹⁻². Echinococcosis occurs worldwide but endemic in cattle and sheep rearing areas including the Middle East, the Mediterranean region of Europe, Eastern Africa, some parts of South America, Australia and New Zealand^{3,4}. Dog is the usual definitive host and sheep is usual intermediate host of *Echinococcus granulosus*, but

humans are accidental intermediate hosts. In the human duodenum, the hatched out embryo penetrates through the mucosa and enters into circulation and lodged in various organs where it forms hydatid cyst. The cysts are located in liver in 75% of cases, lungs in 15% of cases, other organs in 10% of cases.

Renal involvement is rare and forms only 2-4% of all hydatid disease in human⁵⁻⁷. Primary involvement of the kidney without the involvement of the liver and lungs is even rarer. We report a case of isolated hydatid cyst of kidney treated successfully.

Case Report:

A 36 year old female patient presented to our hospital with pain and gradually increasing lump in the right flank for 6 months. Pain was mild, dull aching and non radiating. Her bowel and bladder habit was normal. She was not anaemic and non icteric. A non tender lump occupying right lumbar region was palpable measuring about 7.5cm in diameter with smooth surface, firm consistency, restricted side to side mobility but moved above downwards with respiration. Rest of the abdomen was normal. The USG of abdomen revealed a well defined cystic lesion (7cm x 6cm) occupying upper and mid region of right kidney with multiple cyst of varying sizes inside and hyperechoic stroma. Other organs were normal and no other cystic lesion were found anywhere in abdomen on USG. Because of nature of cyst on USG

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a provisional diagnosis of hydatid cyst of right kidney was made. There was no history of hydatiduria. The lady was living in a village with her family having goats, sheep and pet dogs in their house. There are multiple stray dogs also living in their village. Her total leukocyte count shows eosinophilia. Serological tests for hydatid cyst were not done due to unavailability. X-ray chest showed no cystic lesion in lung. IVU showed a smooth filling defect in mid region of right kidney which displaced the pelvicaliceal system towards left side (Fig 1).

With the diagnosis of hydatid cyst of right kidney, albendazole was started 400mg twice daily. After 2 weeks, operation was done through right lumbar incision and extra peritoneal approach. Peroperatively a thick walled tense cystic swelling occupying mid region of right kidney was identified. Surrounding tissues were protected with mops soaked with providone iodine 10% (scolicidal agent). The cyst was decompressed by aspiration and scolicidal agent (providone iodine 10%) was injected inside cyst and retained for 10 minutes. An incision was given to cyst wall, and total cystectomy was performed leaving pericyst in situ (Fig 2). No bleeding or urine leak was found from pericystic wall. Later cyst cavity was irrigated with providone iodine 10% and cyst was deroofed and marsupialized (Fig 3). Abdomen was closed with a drain. Postoperative period was uneventful and she was discharged on 8th postoperative day with albendazole 400mg twice daily for 1 month. The histopathological examination was consistent with renal hydatid disease. She had been followed up 6 monthly for next 3 years without any symptoms and without any cystic lesion in liver and kidney on USG.



Figure-1: IVU shows smooth filling defect of right kidney which displaces pelvicaliceal system.

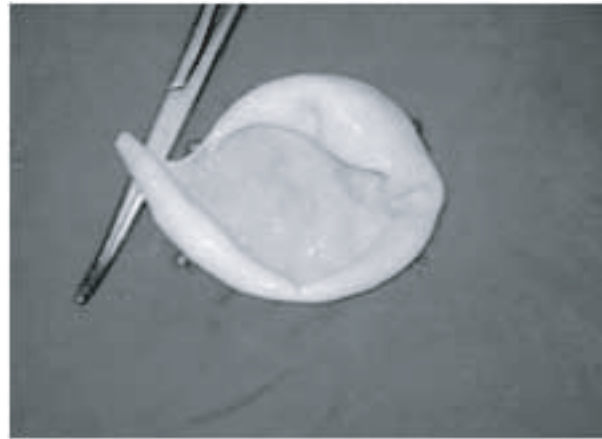


Figure-2: Resected endocyst

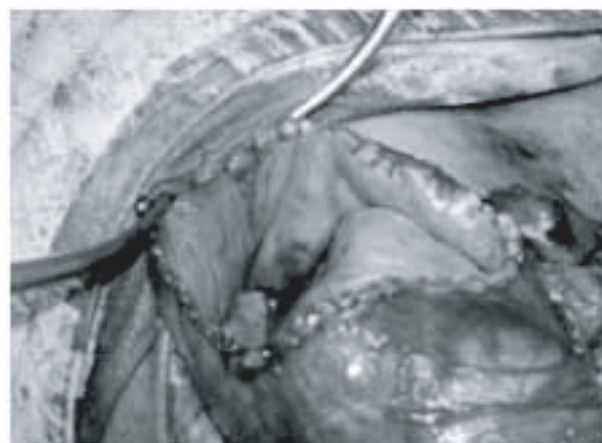


Figure-3: Deroofed and marsupialized cyst wall

Discussions:

Hydatid disease is a zoonosis and is caused by the larvae of *Echinococcus* tapeworms, primarily of *Echinococcus granulosus*. Although hydatid disease is worldwide in distribution, it is endemic health problem in certain regions of world. It is most commonly found in those countries where sheep and cattle raising constitute an important industry and consequently there is a close association between man, sheep and dog^{1,2}.

The life cycle of *Echinococcus granulosus* involves two hosts: a definitive host usually a dog or other carnivore such as wolf, fox and jackal. Sheep is the usual intermediate host but cattle, horse and goat may also involve. Humans are accidental intermediate host. The adult worm resides in the proximal small intestine of the definitive host and millions of parasitic eggs are excreted in host's feces. These are swallowed by

intermediate host i.e. sheep, cattle, hoarse, goat while grazing in the field and also by humans due to taking contaminated foods and drinks⁸. In the duodenum of intermediate host, the embryos are hatched out from eggs and bore their way through the intestinal wall and enter the radicals of portal vein. The embryo usually becomes lodged in hepatic capillaries and developed into hydatid cyst within liver where it enlarges 2-3cm per year^{6,9}. Some of the embryos may pass through the hepatic capillaries, enter the pulmonary circulation and form hydatid cyst in lung. Even a few embryos may pass the pulmonary capillaries, enter general blood circulation and lodge in the various organs of body where they forms hydatid cyst. The life span of larval form is considerable and it may continue to develop for many years. The cycle is completed when the definitive host ingests infected viscera from intermediate host. As dog have no access to the hydatid cyst developed in the viscera of human, the life cycle of the parasite comes to dead end. The natural cycle is thus maintained by sheep and dog. Thus, dog is the optimum definitive host, sheep appears to be optimum intermediate host and man is an accidental intermediate host¹⁰.

In the intermediate host, where the larval form of *Echinococcus granulosus* settles, it forms hydatid cyst. The development of hydatid cyst in human is very slow (average increase: 1 to 30 mm per year), 5 to 10 years are required before cysts enlarges sufficiently to cause symptoms¹⁰. The cyst wall consists of three layers: a) Inner germinal layer: it is cellular layer and consists of a number of nuclei embedded in protoplasmic mass. It is very thin and measures about 22 to 25 micrometer in thickness. It is the vital layer of the cyst and gives rise to brood capsules with scolices, daughter cyst, secretes hydatid fluid and forms middle layer; b) the middle laminated membrane: it is acellular hyaline membrane having thickness up to 1mm. To the naked eye, it has the appearance of the white of hard-boiled egg; c) Outer most layer: is called pericyst which is a protective layer that forms in response to the presence of parasite and consists of modified host cells. Inner germinal layer and middle laminated membrane forms true wall of the cyst, or the endocyst^{10,11}. Pericyst is the host part by which host isolates itself from the parasite. Pericyst is important surgically, leaving pericyst in situ and removing the content of the cavity is a well documented and accepted technique². The cyst fluid is clear transudate that contains sodium chloride, proteins, glucose, ions, lipids and polysaccharides. It is antigenic, and if released into the host's circulation as a result of cyst rupture, it may cause eosinophilia or anaphylaxis¹¹.

The liver (75% of cases) and lung (15% of cases) are most commonly affected by hydatid cyst, although any organ may be involved (10% of cases)^{1,2,5,7}. Isolated renal involvement is rare and forms 2-4% of all hydatid disease in human^{5-7,12}. Renal hydatid cysts are an insidious disease and often are asymptomatic for many years and cysts can become quite large before clinical signs and symptoms appear^{11,13}. The most common presenting clinical features are flank pain, flank mass^{7,11,14}. In 10-20% of cases, renal hydatid disease is complicated by cyst rupture into collecting system, with resultant acute renal colic and hydatiduria (Gelatinous material, grape skins or daughter cysts in urine) and this is the only pathognomonic sign of renal hydatid cyst^{11,14-17}.

The only abnormality in the routine blood examination of patient with hydatid disease that has diagnostic implications is eosinophilia which is reported in 40 to 50% of cases¹⁵. Serological tests in primary renal hydatidosis are usually negative¹⁷. Ultrasonography and advanced radiological techniques like CT scan and MRI remains the mainstay of diagnosis. Ultrasonography helps in the diagnosis of hydatid cysts when daughter cysts and hydatid sands are demonstrated. On changing the patient's posture under real time, there is shifting of hydatid sand, which may give rise to the "falling snowflake pattern"¹⁷. Abdominal radiography may reveal a soft tissue mass that corresponds to the hydatid cyst. Ring shaped or curvilinear calcification may be seen in 20-30% of cases because of calcification of the pericyst¹¹. If the cyst is intact, intravenous urography reveals a space occupying lesion that displaces calices. Typical CT findings of renal hydatid disease include a unilocular cyst, a multilocular cyst with mixed internal attenuation and daughter cysts with lower attenuation than that of the maternal matrix, a completely calcified cyst^{11,14,18}. The cyst wall often enhances after contrast material is administered. The MRI shows the cysts adequately, but MRI offers no real advantage over CT scan^{17,19}. The diagnosis of primary hydatid cyst of the kidney, in the absence of hydatiduria, is usually radiological as most patients have negative immunological test¹⁷.

Treatment of renal hydatid disease is primarily surgical and consists of nephrectomy, partial nephrectomy, or kidney sparing surgery^{15,16,20}. Kidney sparing surgery (enucleation, marsupialization and cystectomy) is possible in most cases (75%). Nephrectomy (25% of cases) must be reserved for destroyed kidney¹⁷. Very few cases of laparoscopic removal of renal hydatid cyst are reported¹². Utmost care should be taken during surgery to prevent spillage and resultant dissemination

by injecting scolicedal agent into cyst during operation and also by separating the operating area with sponge soaked with scolicedal agent. Medical management by albendazole is used only as adjuvant therapy. Using albendazole for one week to one month before surgery may kill or reduce the activity of Echinococcus larvae. Continued use of albendazole for 3 months after surgery may also reduce recurrence²¹. Percutaneous management which consists of aspiration, injection of scolicedal agent and reaspiration, has proved safe and effective in small studies, but concerns remain about possible risks of fluid dissemination and fatal anaphylactic reaction^{11,22,23}.

Conclusion:

Hydatid cyst is not a common disease in Bangladesh but a serious health problem in many endemic countries. Hepatic and pulmonary hydatid cysts are most common. Renal hydatid cyst is an uncommon presentation of echinococcal infection. Clinical manifestations of renal hydatid disease often are nonspecific but characteristic imaging findings are highly suggestive of the diagnosis. Treatment of renal hydatid disease is primarily surgical and kidney sparing surgery is preferable if possible.

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