Hydatid Cyst of Urinary Tract
Eleven Cases at a Single Center

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Introduction: We retrospectively reviewed clinical records of 11 patients with hydatid cyst of the urinary tract admitted to our institution from 1998 to 2005.

Materials and Methods: Hospital and follow-up records of 11 patients with hydatid cyst of the urinary tract were reviewed and data on the patients' symptoms and signs at presentation, radiological findings, diagnostic tests, pathologic findings, and surgical outcomes were reviewed.

Results: The chief complaint was flank pain in 7 patients (63.6%). Hydaturia was not seen in any of our patients. Ten patients had renal involvement and 1 had a retrovesical hydatid cyst. Eosinophilia was detected in 2 of 11 patients who were tested. A positive indirect hemagglutination test was seen in 4 of 7 patients and a positive Casoni test in 1 of 2. Intravenous urography revealed caliceal distortion in 6 patients (54.5%), caliectasis in 3 (27.3%), and nonfunctioning kidney in 2 (18.2%). Ultrasonography showed a complex cyst in all of the patients. Computed tomography demonstrated multivesicular cystic structure in 4 patients (36.4%), complex cyst in 4 (36.4%), and a simple cyst in 3 (27.3%). Definite diagnosis was made only after surgical operation. We performed nephrectomy in 2 patients (18.2%), partial nephrectomy in 2 (18.2%), cystectomy plus marsupialization in 5 (45.4%), and retrovesical surgery in 1 (9.1%). One patient refused surgical treatment. There was no perioperative major complication.

Conclusion: Renal hydatidosis is a rare entity and the main challenge is preoperative diagnosis. Radiological and serologic studies, although indicative, cannot confirm the diagnosis, and only pathologic examination after surgical removal can confirm echinococcal infection.

Keywords: hydatid cyst, space occupying lesion, urinary tract, diagnosis

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INTRODUCTION

Echinococcosis is an infection caused by the larval stage of a tapeworm called Echinococcus.[1] There are 3 species of Echinococcus that cause hydatid disease. Echinococcus granulosus is the most common type, whereas Echinococcus multilocularis and Echinococcus oligartus account for a small number of cases.[1] Dog is the definitive host of Echinococcus granulosus, in which the adult tapeworm is attached to the villi of the ileum. Eggs are passed and deposited within the dog's feces. Sheep is the usual intermediate host, but humans are accidental intermediate hosts. In the human duodenum, the parasitic embryo penetrates the mucosa, allowing access to the blood stream, and enters the liver (most commonly) and the lungs.[1]

Clinical manifestations result from blood-borne invasion of the liver (50% to 70%) and the lungs (20% to 30%). Most infected individuals are asymptomatic and it might take 5 to

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20 years for a cyst to grow to its symptomatic size (3 cm to 15 cm).[1] The kidneys are the most commonly affected organs in the urogenital tract (2% to 4%),[2] although hydatid cyst of the prostate, the seminal vesicles, and the testes have also been reported.[1] Echinococcal larvae may reach the kidney through the blood stream or lymph nodes, and by direct invasion.[1]

Reports on urogenital hydatid cyst are limited in the literature, and usually there are no specific clinical manifestions or laboratory findings for an accurate diagnosis of renal hydatid cysts. Radiological studies might be helpful, but they cannot provide specific findings.[2] We present our 8-year experience in the diagnosis and management of 11 patients with hydatid cyst in their urinary tract.

MATERIALS AND METHODS

A total of 11 patients with urinary hydatidosis were admitted and treated from 1998 to 2005 at Hasheminejad Hospital. Ten patients had renal involvement and 1 had a retrovesical hydatid cyst. Investigations included history, physical examination, complete blood count, serum biochemistry, urinalysis, the Casoni test (intradermal skin test), and indirect hemagglutination test. All patients underwent ultrasonography, intravenous urography (IVU), and computed tomography (CT) scan. Bone scan was carried out in 3 patients and dimercaptosuccinic acid (DMSA) renography in 2, for bone pain and nonfunctioning kidney, respectively.

The clinical and laboratory data of the patients were retrospectively collected from the hospital and follow-up records.

RESULTS

Of 11 patients, 8 (72.7%) were men and 3 (27.3%) were women. The median age of the patients was 48 years (range, 21 to 72 years). Six patients (54.5%) had prior contact to dog. The main clinical symptom was flank pain; 7 patients (63.6%) had only flank pain, 1 (9.1%) had post-ejaculation pain, and 3 (27.3%) were asymptomatic (Table 1). Two patients (18.2%) had bilateral hydatid cysts and 1 (9.1%) had a palpable mass.

Eosinophilia was detected in 2 patients (18.2%). Indirect hemagglutination test was carried out in 7 patients (63.6%), being positive in 4 (57.1%). Of the 2 patients who underwent the Casoni test, 1 had a positive result.

Calcification was seen in 1 patient (Figure 1). Intravenous urography revealed caliceal distortion in 6 patients (54.5%), caliectasis in 3 (27.3%), and nonfunctioning kidney in 2 (18.2%) (Figure 2). Ultrasonography was done in all patients and with no exceptions showed a complex cyst. Computed tomography was also performed in all patients and demonstrated multivesicular cystic structure in 4 patients (36.4%), complex cyst (Bosniac III) in 4 (36.4%), and a simple cyst in 3 (27.3%) (Figures 3 and 4). Bone scan and DMSA scan were performed in 3 (27.3%) and 2 (18.2%) patients for bone pain and nonfunctioning kidney, respectively and a space-occupying lesion with no parenchymal function was demonstrated in all cases. A definitive diagnosis was not made in any of the patients before the surgery and pathologic examination.

The treatment details are listed in Table 2. Ten patients underwent surgical operation and 1 refused

Table 1. Clinical and Demographic Data of Patients With Hydatid Cyst of Urinary Tract*

Patient	Age, y	Sex	Chief Complaint	Main Sign	Environmental Contact
1	29	F	Flank pain	Gross Hematuria	P
2	55	F	None	None	N
3	58	M	Bilateral flank pain	None	P
4	72	F	None	None	…
5	58	M	Flank pain	None	P
6	21	M	Flank pain	None	…
7	50	M	Flank pain	None	P
8	62	M	None	None	P
9	46	M	Bilateral flank pain	None	…
10	56	M	Bilateral flank pain	Palpable mass	P
11	21	M	Post-ejaculation pain	None	N

*F indicates female; M, male; P, positive; N, negative; and ellipses, no available data.

Figure 1. Calcification in the lower pole of the right kidney in a 46-year-old man (case 9).

Figure 2. Upper pole of caliectasis in a 55-year-old woman (case 2).

Figure 3. Hydatid cyst of the right kidney in a 58-year-old man with a dense cyst wall (case 5).

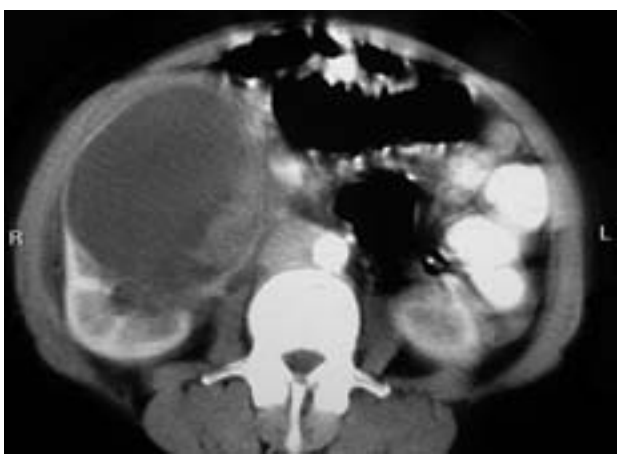

Figure 4. Hydatid cyst of the right kidney in a 62-year-old man with complex cyst (case 8).

surgical treatment. In cystectomy, the outer gelatinous membrane of the cyst and the whole inner germinal membrane were removed after isolation by gauze packs soaked in hypertonic saline solution and sterilization of the cyst content by injection of povidone iodine for 10 minutes. The margins of pericyst remnants were oversewed. A drain was placed in the cyst cavity. One patient was explored due to retrovesical involvement in whom the cyst was approached extraperitoneally (Figure 5).

No mortality was seen in the perioperative period. Overall, complications were seen in 2 patients (18.2%). One patient had a pleural effusion 3 days after the operation that was treated successfully by placing a chest tube. Another patient presented a continuous urinary leakage from the operation site. He was treated with a double-J stent that improved leakage within 1 day. All of the patients were treated

Table 2. Treatment Data of Patients With Urinary Tract Hydatid Cyst

Patient	Hospital Stay	Surgical Complication	Surgery
1	5	None	Cystectomy and Marsupialization
2	6	None	Nephrectomy
3	4	None	Partial nephrectomy
4	5	Pleural effusion	Cystectomy and Marsupialization
5	15	Urinary leakage	Cystectomy and Marsupialization
6	7	None	Nephrectomy
7	4	None	Partial nephrectomy
8	6	None	Cystectomy and Marsupialization
9	5	None	Cystectomy and Marsupialization
10	5	None	Retrovesical surgery
11*	7	...	...

*The patient refused surgical treatment.

Figure 5. Retrovesical hydatid cyst in the cystography of a 21-year-old man with post-ejaculation pain (case 10).

with oral albendazole, 400 mg twice a day, at least for 3 postoperative months.

Pathologic examination confirmed hydatid cyst in all of our patients. Radiological assessment showed improvement in all of the patients after 3 to 6 months.

DISCUSSION

Hydatid cyst is a parasitic infection caused by the larval form of Echinococcus granulosus. The adult worm of Echinococcus is present in the dogs' small intestine. An intermediate host (human for instance) may ingest echinococcal eggs excreted in the feces of dogs. The eggs penetrate the duodenum and enter the portal system.[3] If not filtered out by the liver, embryos enter the systemic blood circulation and may lodge in any organ. Embryos that are not phagocyted and destroyed develop into hydatid cyst.[4]

Usually, there are no specific signs or symptoms for renal hydatidosis and the disease usually remains asymptomatic for years. The most common symptoms are palpable mass, flank pain, hematuria, malaise, and fever.[5] Hydaturia is a pathognomonic sign.[5] Its origin is a grape-like material in the urine resulting from the rupture of the cysts into the collecting system. It has been reported in 5% to 25% of all renal hydatidosis cases,[5] but hydaturia was not detected in our patients.

There is no serological and immunological test pathognomonic for hydatid disease. Eosinophilia, the Casoni test, complement fixation test, and indirect hemagglutination test may be helpful for diagnosis of renal hydatidosis.[6] Eosinophilia is detected in 20% to 50% of patients with renal hydatidosis, but its detection cannot help much since false-positive results may develop in the other parasitic diseases.[5] The Casoni test produces positive results in about 25% to 50% of patients, while complement fixation test yields about 40% positive results and even indirect hemagglutination test has a higher positive rate of about 75% for hydatid disease.[6] In conclusion, a negative serology result does not exclude hydatid disease and on the other hand, a positive one does not confirm the diagnosis.[5] In

our series, indirect hemagglutination test was done in 7 patients, which was positive in 4. Moreover, eosinophilia was seen in 18.2% of cases.

Radiological studies have a more important role in the preoperative diagnosis of renal hydatidosis. On plain abdominal radiography, ring-shaped calcification can be visualized.[7] Calcifications may be linear, multilaminated, or amorphous. Intravenous urography shows distortion of the calixes or caliectasis as a result of a renal mass involving the collecting system. A nonfunctioning kidney or a filling defect in the renal pelvis may be rarely evidenced by IVU.[7]

Ultrasonography is usually the primary radiological investigation, because of its advantages including cost-effectiveness and noninvasiveness. Hydatid cyst on ultrasonography may be unilocular or multivesicular.[7] The determination of daughter cysts, which is characteristic of a hydatid cyst, is also possible on ultrasonography. With its own advantages, CT can detect calcification and daughter cysts much easier; thus, it is more sensitive and accurate than ultrasonography.[7]

Stable, asymptomatic, and calcified cysts do not require specific therapy, but should be monitored by serial imaging over several years to ensure a benign nature. When technically feasible, expanding, symptomatic, and infected cysts are best removed with surgery and isolation and killing of the cysts with hypertonic saline (25 g/dL to 30 g/dL) or other agents such as ethanol.[1-4] Many symptomatic echinococcal cysts are not amenable to resection. In such cases, medical treatment with antihelminthics, either long-term mebendazole or albendazole can be effective.[4]

CONCLUSION

Hydatid disease of the urinary tract is a rare condition and the kidney is the most common site of involvement in the urinary system. Primary diagnosis is made by ultrasonography and CT scan. Surgery is the choice of treatment.

CONFLICT OF INTEREST

None declared.

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