Original Research Article

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Presentation and postoperative outcomes of residual cavity of liver hydatid cyst

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ABSTRACT

Background: Hydatid disease is endemic in the Mediterranean region, the Middle East and South America. The aim of the study was to follow up the fate of residual liver hydatid cysts cavities after surgery.

Methods: From the period of April 2014 to April 2017 a prospective study was conducted on sixty patients who were admitted to Fallujah Teaching Hospital for surgery of hydatid cyst of the liver. There were 36 female and 24 male patients who were followed up by serial abdominal ultrasound examinations at three monthly intervals for a period of up to two year.

Results: Complete involution of the hydatid cavities occurs more in those treated by omentoplasty and simple closure and complications are lower than those treated by external drainage.

Conclusions: Characteristics of liver hydatid cyst and the type of surgical treatment can be considered as a determinant of postoperative cavity related complication.

Keywords: Hydatid cyst, Residual cavity

INTRODUCTION

Hydatid disease or echinococcosis is a parasitic infection caused by the larval form of tapeworm of genus The disease is endemic in the Echinococcus. Mediterranean region, the Middle East and South America.1

The disease has a variable clinical course. Hydatidosis may be asymptomatic for many years. It may become evident while the liver is imaged for other reasons.²

Soulsby (1982) identified four types of medical types of hydatid disease.³ For which man is accidental intermediate host; dogs and sometimes foxes are the definitive hosts that harbor adult worms in their intestine.4 Dogs becomes infected by eating uncooked sheep carcasses that contain hydatid cyst. 4-6

As would be expected the disease is relatively common in the sheep-rearing districts of Australia and South America, Greece, Turkey, Iran, Iraq, while for the same reason, in the British Isles, Wales shows the highest incidence.⁷

Hydatid disease constitutes one of the major endemic diseases in Iraq mainly in the central and southern zones where, between the Tigers and Euphrates rivers, this area is inhabited by farmers who produce cereals and raise sheep in large numbers, the disease is usually caused by E. granulosus in comparison to which E. mulilocularis is a rarity. 8-10

Most of the cysts are acquired in childhood following ingestion of materials contaminated with dog feces. 11-13 The ova penetrate the wall of the intestine and pass via the portal vein to the liver then the lung or other tissues.⁶

There the embryo develops slowly into a hydatid cyst, reaching a diameter of 1 cm in five months or so they need long time to become evident. The daughter cyst is formed by three ways: (a) By injury to the germinal layer; (b) from protoscolices, which is (0.1 mm), it has sucker & hooks; (c) from brood capsule which form from germinal layer, it contains (5-20) protoscolices. 47,13

About 50-80% of cases are in the liver, of these 20-60% are multiple; and in 70-85% located in the right lobe while in 14-25% in the left lobe. $^{3-6,13}$

The patient may be asymptomatic or symptomatic as right upper quadrant pain or swelling in the upper abdomen, tenderness, biliary colic or jaundice. 4,6,13

Treatment is mainly surgical but medical treatment using mebndazole and albendazole has been tried as the primary treatment and albendazole in one study gave 19% cure rate, it has been used preoperatively, and postoperatively to prevent recurrence. Now percutaneous aspiration was tried in type (1) cyst.

Surgical treatment can be in the form of partial hepatectomy or pericystectomy. The latter accomplished by developing surgical plane just outside the pericyst layer used for pedunculated cysts.^{3,21} Enucleation may be used for small univesicular cysts, and evacuation of the cyst after instillation of scolicidal agent such as formalin. Hypertonic saline solution 20-30% and sodium hypochlorite 0.5% are used, this procedure will leave a cavity which can be sterilized by using scolicidal agent inside. The cavity remained a potential space which can be treated by many way such as marsupialization, primary closure of the cavity without drainage for uncomplicated cysts or with drainage for cavities with biliary leak or infection, internal drainage of the cavity to peritoneal cavity or stomach or duodenum or jejunum, omentoplasty. ^{3,14,15,18}

The aim of this study was to assess the cavity outcomes in the postoperative period by serial ultrasound examinations to determine its fate whether recurrence of the disease, partial or complete involution or development of complications.

METHODS

This was a prospective cross sectional study design, conducted at Fallujah Teaching Hospital for the period from April 2014 to April 2017 involving 60 patients who admitted to the hospital. The study was approved by the institutional ethics committee of the hospital.

Inclusion criteria were adult above 18 years of old; provide consent to participate in this study, and Iraqi national. Exclusion criteria were presence of other surgical emergencies, and presence of perforation. All cases were of the primary hydatid disease of the liver.

Diagnosis of the disease mainly based on history, clinical examination and ultrasound examination done in different ultrasound clinics, eosinophil count often done, and then the diagnosis confirmed by surgery. All cases proved to have hydatid disease. Chest X-ray was done routinely to exclude hydatid of the lung which has priority for treatment.

All the patients treated surgically, by evacuation of the ectocyst after injecting a scolicidal agent. About 20–30% hypertonic saline is used, the pericyst irrigated with scolicidal agent, so the surgical site was left with the pericyst residual cavity which is the main concern of this study, this was treated by external tube drainage with or without under-running sutures of the small biliary ducts communicated with the cyst in 63 cysts in 27 patients, by simple closure in 30 cysts in 20 patients and by omentoplasty with under-running sutures of the small biliary ducts communicated with pericyst in 13 cysts in 13 patients.

No exploration of the common bile duct was done in those cases. All patients received antibiotics postoperatively. Postoperatively those cases were followed up by ultrasound examination done all in the ultrasound department in Fallujah teaching hospital at three monthly intervals for 2 year postoperatively.

All data were entered and analyzed using Statistical Package for Social Sciences (SPSS) version 22. A probability of less than 0.05 is considered significant for Chi-square test.

RESULTS

Out of 60 patients involved in this study, thirty-six were females (60%) and 24 were males (40%). Patients' ages range from 6–65 years with an average age 29.8 years.

In those patients, hydatid cysts were diagnosed in the liver and treated surgically. The size ranged from 4–17.5 cm with an average of 10 cm in the largest diameter, only one cyst had partial calcification.

In the study, patients are mostly presented with abdominal pain and tenderness (50%) and least presentation were jaundice (3.3%). In 40 patients (66.7%) the right lobe of the liver was only involved. The left lobe only was involved in 8 patients (13.3%) while both lobes were involved in 12 patients (20%). Involvement of the liver was with single cyst in 27 patients (45%) and with multiple cysts in 33 patients (55%).

None of the patients had received medical treatment for the hydatidosis neither preoperatively nor postoperatively. The different types of surgical treatment are presented below, most patients (27) were treated by external drainage, 20 patients were treated by simple closure, 13 patients were treated by omentoplasty.

Table 1: Age distribution, clinical features and site of cyst (n=60).

Variable	No. of patients	%	
Age group (in years)			
1–10	3	5	
11–20	15	25	
21–30	15	25	
31–40	12	20	
41–50	10	16.7	
51–60	3	5	
61–70	2	3.3	
Clinical presentations			
Abdominal pain and	30	50	
tenderness	30	30	
Incidental finding	13	21.7	
Hepatomegally	9	15	
Mass in the upper	6	10	
abdomen	0	10	
Jaundice	2	3.3	
Site of the cyst			
Right lobe of the liver	40	66.7	
Left lobe of the liver	8	13.3	
Both lobe of the liver	12	20	

Table 2: Different types of surgical treatment.

Variable	No. of patients (n=60)	No. of cysts
Type of surgery		
External tube drainage	27	63
Simple closure	20	30
Omentoplasty	13	13
Fate of the cavity		(%)
Complete involution	21	35
Partial involution	36	60
Recurrence	3	5

Review of the ultrasound follow up of the forty patients demonstrated that 3 patients of the cases showed clear cut recurrence of the disease (5%) diagnosed by ultrasound during two years after surgery and some of them

confirmed by surgery, all of them had multiple hydatid cysts in the liver (Table 2).

In general the higher percentage of complications occurred in patients treated by external drainage (48.1%) while the least percentage took place in patients treated by omentoplasty (7.7%) (Table 3).

Table 3: Types of treatment and complications.

Type of treatment	No. of patients N (%)	No. of patients with complications N (%)
Tube drainage	27 (45)	13 (48.1)
Simple closure	20 (33.3)	5 (25)
Omentoplasty	13 (21.7)	1 (7.7)
Total	60 (100)	19 (31.7)

Partial involution of the cavity took place in 36 patients (60%), complete involution took place in 21 patients (35%), and recurrence took place in 3 patients (5%). All patients were followed up for two year after the date of operation.

Infection of the cavity was (25.9%) in group of patients treated by external drainage, (10%) in those treated by simple closure and (7.7%) in those treated by omentoplasty.

Bile leak occurred in 4 patients (14.8%) in external drainage group and in two patients (10%) in simple closure group while it was nil in omentoplasty group, the leaks were ceased in average of 7 days (Table 4).

In all patients if any biliary communication found with cyst it is closed with under-running absorbable sutures. No biliary fistula had developed in the study group. The patients who had infection in the residual cavity ended with complete involution of the cavity but during a longer period than the uncomplicated cysts. None of our patients had neither cholelithiasis nor cirrhosis of the liver associated with hepatic hydatidosis. Operative mortality was nil.

Table 4: Postoperative cavity related complications.

Type of cavity management	No. of patient	No. of patient with cavity infection	No. of patient with bile leakage	Average of duration of leakage\days	Recurrence	Mean stay in hospital in days
		N (%)	N (%)	-	N (%)	
External tube drainage	27	7 (25.9)	4 (14.8)	7	2 (7.4)	4
Simple closure	20	2 (10)	2 (10)	2	1 (5)	2
Omentoplasty	13	1 (7.7)	0		0	1

DISCUSSION

The surgical management of liver hydatid cyst is still a matter of controversial issues. Moreover, surgical procedures are diverse.

The surgical approaches (conservative or radical) may be chosen on the basis of local expert and the characteristics of each individual case (e.g. age of the patient, number, size and location of the cysts). The type of surgical approach that has been used in our study include:

- External drainage of the cavity with closure of any biliary leak (if present) with absorbable sutures, this procedure was performed in 27 patients (45%). The complications were infection in 7 patients and leak in 4 patients and recurrence in 2 patients. The result of our study are nearly similar the results obtained by Ogata.31
- Simple closure of the cavity with closure of any biliary leak (if present) with absorbable sutures, it performed by filling the residual cavity by saline solution and close the edges with running absorbable sutures, this procedure was performed in 20 patients (33.3%). The complications were infection in 2 patient and leak in 2 patient and recurrence in 1 patient. In a study done by Humood et al, 7 patients were managed by this methods without any complications postoperatively.³²
- Omentoplasty: the cavities were inspected and any apparent leak was closed by absorbable sutures, and sometimes with partial excision of the pericyst then the cavity is obliterated with omental patch and secured to the margin of the pericyst cavity by absorbable sutures, this procedure was done in 13 patients (21.7%). The complications were infection in 1 patient only. It was superior to the other procedures because it has lower rate of complications. Omentoplasty decrease the leak, fistula, infection and decrease post-operative hospitalization, but it cannot be done in multiple cysts. Our result is nearly similar to the previous study done by Dziri.33

In other study conducted by Talib, he found that the recurrence rate in the liver ranges from 10-15% and the longest interval he encountered between removal of the primary cyst and recurrence was about 15 years.¹

Mortality rate was nil in the study although ranges between 2.6-3% have been reported.²⁰ The average period for complete involution of the cavity was 11 months. In one study done by Beggs he found that a cavity was still shown by ultrasound up to six years after omentoplasty was performed.¹¹

The cases of partially involute cavities which were followed up for 2 year postoperatively needs to be followed more to find the time of its complete involution if ever happened as was shown by Beggs.

As for the conclusion of Kourias and Gyftaki, our study also showed that the age determine the time for complete involution, the involution occurred earlier pediatric age group.

For the time between inoculation and surgery we found that larger cysts take generally longer time to completely involute.

A recurrence rate of 7.4% in external drainage group and 5% in simple closure group. Generally the recurrence rates encountered was ranging from 5-11% although as low rates as 0.5% has been found.

Mottaghian and Saidi had done a study in which they found that there was no correlation between the size of the removed cysts and postoperative recurrences, the risk of recurrence and associated morbidity was highest in patients with multiple cysts and that certain technical problems increase the chance of inadvertent operative rupture and spillage of cyst contents with subsequent regrowth of new cysts.9

CONCLUSION

Conservative approaches showed good results. Evacuation of the cyst with partial excision of the pericyst and omentoplasty resulted in the lowest morbidity, shortest post-operative hospital stays and the best clinical results. Ultrasound is useful easy technique in following patients who have been operated on for hydatid cysts of the liver.

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Institutional Ethics Committee

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