External Tube Drainage Versus Omentopexy In The Management Of Residual Hepatic Hydatid Cyst Cavity

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Citation

A Malik, S Bari, K Shah, F Shah, R Amin, M Jan. *External Tube Drainage Versus Omentopexy In The Management Of Residual Hepatic Hydatid Cyst Cavity*. The Internet Journal of Surgery. 2007 Volume 15 Number 1.

Abstract

Hydatid disease is a parasitic disease of worldwide distribution. Seventy-five per cent of all hydatid cysts are found in the liver. Patients may be asymptomatic for years and usually present with non-specific complaints. The principles of surgical management of hepatic echinococcosis include neutralization of parasites, evacuation of cyst, removal of germinal lining and management of the residual cavity. Our study is confined to the management of the residual cavity, carried over a period of four years with further follow-up for a period of three years. We divided the patients into two groups of 65 patients each. In one group 1, the residual cavity was managed with external tube drainage and in group 2 the residual cavity was managed by omentopexy. The results of the procedures were compared with each other as for time duration for surgery, intraoperative complications, postoperative complications and hospital stay. In the patients managed by external tube drainage, the average operation time was 1 hour and 45 minutes, hospital stay was 10-12 days, and prolonged tube drainage was seen in 9 patients (14%), while in patients managed by omentopexy average operation time was only 1 hour and 35 minutes, hospital stay was 8-10 days and none of the patients had prolonged drainage. Recurrence was seen in 8 patients (12%) managed with external tube drainage, while none of the patients managed with omentopexy had any recurrence of disease.

INTRODUCTION

Hydatid is a Latin word meaning a drop of water. It implies a cyst-shaped structure containing water-like fluid ([1]). The causative organism of hydatid disease is the post-larval metacestode stage of tape worm echinococcus granulosus. Echinococcus granulosus has world-wide distribution. Factors like poor hygienic conditions, lack of education and lack of health care contribute to the development of disease. The adult worm lives in the intestine of dogs and other related carnivores ([1]). Sheep and cattle are the intermediate hosts for the parasite. Humans happen to be the accidental intermediate host. The most common site where parasites get lodged is the liver. In the liver, the parasite develops into the larval stage - the hydatid cyst ([2]), with resultant complications.

Surgical intervention remains the definitive treatment for hydatid cysts of the liver with the aim of completely removing the parasitic cysts along with its scolices, germinal epithelium, daughter cysts and fluid. Small, deep parenchymal cysts measuring less than 4cm can be managed conservatively ([3]). After evacuation, the management of the residual pericystic cavity has been a subject of controversy as postoperative morbidity and mortality may be related to the method used.

The pericystic cavity can be left open to the peritoneum as in the case of superficial cavities or the cavity can be obliterated by capsulorrhaphy, omentopexy, capitonnage or introflexion, depending on the surgeon's choice or the cyst can be drained to the exterior by closed tube drainage ([4]).

MATERIAL AND METHODS

The study was conducted prospectively over a period of 4 years from January 2000 to December 2003 with further follow-up over a period of three years in the department of General Surgery, Sher-i-Kashmir Institute of Medical Sciences, Srinagar, Jammu and Kashmir, India. The total number of patients selected for study was 130 and they were followed for a period of three years. The aim of the study was to compare the results of external tube drainage with omentopexy for management of residual cyst cavities after evacuation of hydatid cysts. Sixty-five patients were managed with external tube drainage and another sixty-five patients with omentopexy.

The various parameters which were considered in defining the results and outcome of the surgery were operation time, intraoperative complications, postoperative complications,

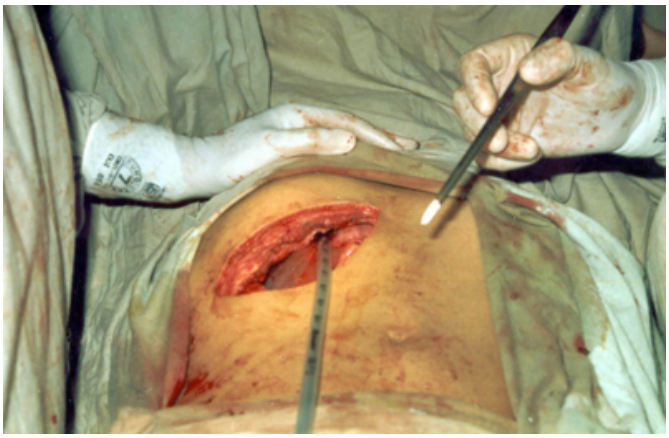
total hospital stay, mortality and recurrence of hydatid cysts. The patients with ruptured cysts, patients with extrahepatic hydatid cysts, bleeding disorders and malignancy were excluded from the study. However, patients with infected hydatid cysts of the liver were included. All the patients were put on albendazole therapy both preoperatively and postoperatively in the dose of 10 mg/kg bodyweight, in order to avoid recurrence. It is our routine in the department to prescribe three cycles of albendazole, each cycle of 4 weeks duration, with a gap of one week in between the cycles for liver function assessment.

All the patients were subjected to a detailed history and physical examination, base line investigations like haemogram, kidney function tests, liver function tests, coagulogram, electrocardiography and X-ray of the chest. Ultrasonography of the abdomen was the main tool for diagnosis of the number, site and size of cysts. All patients were subjected to ELISA for hydatidosis. CT of the abdomen was performed in those cases where results of ultrasonography were equivocal. After all the investigations were done, the patients were taken for surgery. A right subcostal approach was used in all patients. The operative field was carefully protected from hydatid fluid spillage by using packs soaked in cetrimide 1%. The cyst was decompressed by inserting a large-bore angiocath needle and hydatid fluid was aspirated with a syringe after which cetrimide solution was injected into the cavity and left there for ten minutes. The quantity of cetrimide used was less than the aspirated volume of hydatid fluid. The pericyst was opened and the cyst contents were evacuated including all the daughter cysts, the laminated membrane and hydatid fluid. The cavity was cleaned with gauze soaked in cetrimide solution. At the end of the procedure, the cavity was examined for any bile duct leakage which, if found, was closed with vicryl suture. The residual cavity was finally managed by either of the two techniques.

1) External tube drainage (65 patients): In these patients a 24 to 32 F diameter tube drain, depending on the size of cyst, was placed in the cyst cavity and brought out through a separate skin wound (Fig. 1).

Figure 1

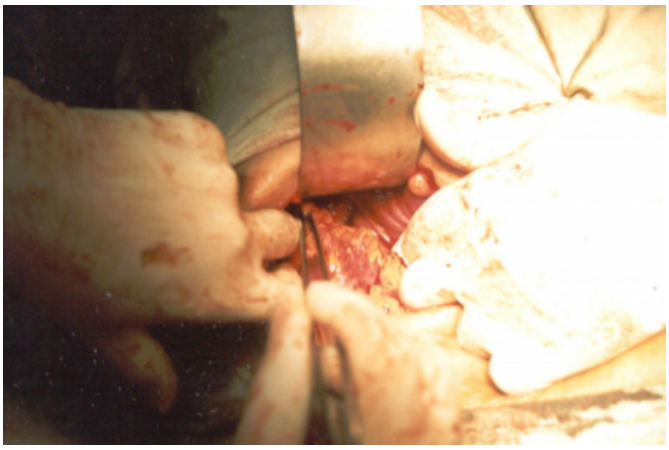
Figure 1: Photograph showing tube drainage



2) Omentopexy (65 patients): In these patients a viable flap of omentum was brought to rest within the cyst cavity on the assumption that the omentum would help in sealing off small biliary leaks and obliterate the cavity as well (Fig. 2).

Figure 2

Figure 2: Photograph showing omentopexy being done



The duration of surgery from skin incision to closure was noted. The amount of blood loss was recorded in each patient. Postoperatively, all the patients were put on intravenous fluids and parenteral antibiotics. Oral nutrition was allowed once the bowel sounds reappeared. The amount and nature of postoperative drainage and the time of removal of drain was noted. Postoperatively, all the patients were monitored for complications like prolonged ileus, bleeding, biliary leaks, pleural effusion, wound infection, suppuration, intraabdominal collection, deep vein thrombosis and thromboembolism. Duration of hospital stay was recorded in each patient. All patients were followed regularly on an outpatient basis using serial liver function tests and USG of the abdomen to detect any recurrence of the disease.

RESULTS

The intra-operative data of the two groups is presented in table 3. There was no significant difference in operation time between the two procedures and none of the patients needed any blood transfusion during surgery. There was no intraoperative complication like uncontrolled bleeding, injury to biliary tract or others. There was a significant difference in postoperative hospital stay when the external tube drainage group (8-10 days) was compared with the omentopexy group (5-6 days). In the postoperative period, the patients with omentopexy behaved more smoothly as compared to the external tube drainage group (Table 4). In the group managed by external tube, 9 patients (14%) had a prolonged drainage varying from 3 to 6 weeks, while in the group managed by omentopexy, none of the patients had such a complication. Eight patients (12%) who were managed by external tube drainage developed recurrence, while no recurrence was seen in the group managed by omentopexy within a stipulated period. None of the patients died in our series. Respiratory tract infection was present in 7 patients (11%) managed by external tube drainage in the form of basal atelectasis. Probably, putting an external tube hampered respiratory tract excursion because of pain, thereby increasing the incidence of so-called lower respiratory tract infection. Postoperative biliary fistula was noted in 6 patients (9%) managed with external tube drainage. The bilious drainage slowly decreased over a period of several weeks and completely stopped by 8 weeks.

Figure 3

Table 1: Demographic and sex pattern of the patients

Method used	Rural	Urban	Males	Females
External Tube	43	22	26	39
Omentopexy	42	23	24	41

Figure 4

Table 2: Operative findings

Findings	Group 1 (n=65)	Group 2 (n=65)	P-value
Single cyst (R) lobe	30	29	>.05
Two cysts (R) lobe	15	15	>.05
Three cysts (R) lobe	5	6	>.05
Single cyst (L) lobe	7	6	>.05
Single right lobe and single left lobe cyst	4	5	>.05
Single right lobe and two left lobe cysts	2	3	>.05
Interlobar cyst	2	2	>.05
Single biliary communication	9	8	>.05
Multiple biliary communications	5	4	>.05
No communication	51	53	>.05

P>.05 (not significant)

Group 1: external drainage group

Group 2: omentopexy group

Figure 5

Table 3

Method used	Average operation time	Intraoperative blood transfusion	Intraoperative complication	Postoperative hospital stay
External tube drainage	1 hr 45 min	Nil	Nil	10-12 days
Omentopexy	1 hr 35 min	Nil	Nil	8-10 days

P<.05(significant)

Figure 6

Table 4

Method used	Post operative bleeding	Prolonged drainage	Suppu-ration	Respira-tory tract infection	Intra-abdom--inal collection	Biliary Fistula	Recur-rence
External tube drainage	Nil	9 (14%)	Nil	7 (11%)	nil	6 (9%)	8 (12%)
Omentopexy	Nil	Nil	Nil	Nil	Nil	Nil	Nil

P<.05

DISCUSSION

Hydatid disease of the liver has a worldwide distribution and is specifically endemic in sheep rearing countries i.e., Australia, New Zealand, South America and the countries surrounding the Mediterranean basin. The disease is caused by the larval stage of echinococcus granulosus. The dog and other related carnivores are the definitive hosts ([1]). Once the dog defecates, a large number of eggs are passed to the exterior causing contamination of water, vegetables and

fruits harvested at ground level. Once eggs are ingested, they reach the duodenum, where they hatch and release onchospheres. This onchosphere can be carried by blood stream to any part of the body. The most common site, where it gets lodged is the liver and there it develops into the hydatid cyst ([2]). Some of the oncospheres may escape the sinusoidal capillaries of the liver and can reach the lung, where they also develop into hydatid cysts.

As the hydatid grows slowly, the patient may be completely asymptomatic, even when it reaches a large size. Despite such clinical presentation, the disease is to be diagnosed and treated at the earliest because the complications of cysts like infection, rupture, biliary obstruction and anaphylaxis may be life-threatening. Diagnosis is made by a combination of serologic and radiologic investigations supplemented by thorough medical history and examination. Ultrasonography is the most suitable and accurate means of diagnosing hydatid cysts, while computed tomography is invaluable when ultrasonography is equivocal ([4]).

There are two basic surgical methods for managing hepatic hydatidosis:

1) Radical methods: This includes total cystopericystectomy and hepatic resection. Total cysto-pericystectomy involves total excision of the intact cyst including the pericyst. Some authors have favoured it arguing that the risk of spillage into the peritoneal cavity is low ([5]) and that it leads to more rapid closure of the remaining cavity. However, this method involves major liver resection with increase in operative risk, postoperative bleeding and bile leakage. It should be reserved for peripherally placed cysts, pedunculated cysts and extrahepatic intraabdominal cysts ([6]). Hepatic resection is indicated if liver parenchyma of one lobe is destroyed or there are multiple cysts in one lobe or a bilobar cyst is found close to the main vascular structures ([5]). However, it is associated with high morbidity and mortality.

2) Conservative surgical method: This involves evacuation of all the contents of the cysts including germinal lining, daughter cysts, hydatid fluid and scolices, leaving the pericyst behind. This is followed by irrigation of the cavity with a scolicidal agent and management of the residual pericystic cavity. This is the preferred approach for most of the patients ([3]).

Several methods have been put forward for the management of the residual cyst cavity, depending on size, site and number of cysts and preference of the surgeon. These techniques are:

1. Open drainage of cyst cavity into the peritoneal cavity as in case of small, superficial and shallow uninfected cysts ([3]).

2. Obliteration of residual cavity as in case of deeply located cysts ([3]) by:

a) Capsulorrhaphy: The cavity is filled with normal saline and the opening of the cavity is closed without any drain.

b) Capitonnage: Here the dead space is obliterated by a series of purse-string sutures starting from the bottom of the pericyst ([7])

c) Omentopexy: Here a flap of omentum is brought to rest within the pericyst cavity with the assumption that omentum will seal small biliary leaks and obliterate the cavity as well.

d) Introflexion: This is a modification of capitonnage in which the upper edge of the pericyst is sutured to the deepest part of the cavity with absorbable sutures and then the edge of the pericyst is sutured to collapsed edge by a running suture.

3) External tube drainage: An appropriate diameter tube drain is placed in the cyst cavity and brought out through a separate opening as in case of infected cysts and cysts with biliary communication ([3]).

Initially, the residual cyst cavities were dealt with by marsupialization, but unacceptably high rates of complications were reported ([2], [8]) and hence this procedure fell into disregard. Later on, there were reports of successful treatment by enucleation and exernal tube drainage ([5]), but problems of increased infection and prolonged drainage and fistulae were noted ([8]). Primary obliteration of the cyst cavity using omentum or capitonnage has been used successfully and has shown better results ([2], [9]) but cysts need to be uncomplicated.

Papadimitriou and Mandrakes ([8]) conducted a study involving 227 patients with hydatid cysts of the liver. They observed that marsupialization or external tube drainage of the cyst was associated with high incidence of complications like bilious leakage and prolonged hospitalization. On the other hand, omentoplasty had fewer complications and shorter hospital stay. This is in agreement with our results. Lotfi and Hashemian ([9]) performed omentoplasty in 12 patients and observed that average hospital stay in these patients was 10 days and following discharge there was no

drainage or biliary fistula. Iskender Sayek et al. ([10]) reported good results in patients who underwent omentopexy as compared to patients managed with external tube drainage. Similar results were seen in the study conducted by Elhamel and Murthy ([11]) involving 50 patients of hydatid liver cysts. Dawson et al. ([12]) conducted a study involving 48 patients and concluded that omentoplasty is the best technique as it is associated with shorter hospital stay and lower incidence of biliary fistula. These results are similar to the results of our study.

Pitt et al. ([9]) conducted a study involving 24 patients with hepatic hydatid cysts and concluded that cyst management should be individualized. Small cysts near the surface should be excised with primary closure of the cavity while omentopexy should be employed for larger cysts and in those with thick calcified walls. Langer ([5]) observed in his study that obliteration of the cavity by omentoplasty offered little advantage as infection was quite common. This observation is not in agreement with our results. For cysts communicating with the biliary tract, he proposed that an attempt should be made to directly close the fistula with fine sutures, followed by external tube drainage.

All these studies suggest that there is a definite relation between the method employed for closing the residual hepatic hydatid cyst cavity and complications that may arise from the residual hepatic hydatid cyst cavity ([4]).

CONCLUSION

We conclude that omentopexy is the management of choice for dealing with the residual hepatic hydatid cyst cavity as it is associated with less morbidity, short hospital stay and less recurrence as compared to external tube drainage.

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