Surgical Management Of Hydatid Disease Of The Liver: A Military Experience

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SUMMARY: Hydatid disease of the liver is highly prevalent in oriental countries including Turkey, in which the population live mostly in rural areas. The outcome of surgical methods used in the management of a cystic cavity in patients with hepatic hydatid disease was evaluated. Three hundred and forty consecutive patients who presented to Department of General Surgery between 1988 and 1996 with hepatic hydatid disease were reviewed retrospectively. In the first group surgical methods without drainage such as cystectomy (n=11), capitonnage (n=55), omentoplasty (n=91) and capitonnage + omentoplasty (n=53), in the second group surgery with drainage such as external drainage (n=74), internal drainage (n=7), and combined methods (n=21) were applied. Symptoms, physical findings, types of surgical management, complication rate, hospitalisation period, mortality and recurrence rates were evaluated. Complication rate, average hospitalisation period, recurrence and mortality rates were 12.5%, 9.5 days, 9.9% and 0% respectively in patients without drainage and 63.7%, 26.5 days, 12.7% and 0.9% respectively in patients with drainage. It is concluded that surgical treatment of hydatid disease of the liver without drainage decreases postoperative complication rate and average hospitalisation period, and drainage or nondrainage of cystic cavity has no effect on recurrence.

Introduction

Hydatid disease of liver is highly prevalent in oriental countries including Turkey, in which their population live mostly in rural areas. Its possible complications such as fistula formation and free perforation of the cysts still result in morbidity and mortality rates above acceptable limits (1,2,3). This makes the hydatid disease one of the most common and serious health problems in these countries. Although the prevention of disease is possible by application of simple hygienic measures, it is very difficult to cure once the disease manifest clinically. Since the disease is usually seen in young and middle age (4,5) it will also cause undesirable morbidity in military practice.

The current therapeutic management for hepatic hydatid cysts is still by surgical measures. This study was designed to evaluate different surgical methods, with and without drainage, in its management.

Methods

Three hundred and forty patients with cystic hydatid disease of liver who were admitted to the Department of General Surgery at Gulhane Military Medical Academy Haydarpaşa Training Hospital in Istanbul, Turkey between 1988 and 1996 were reviewed retrospectively. Twenty eight patients with complications such as rupture of cysts into the biliary tract, pleural or peritoneal cavities either preoperatively or intraoperatively, and those with any abdominal surgical problem other than hydatid disease were excluded.

The symptoms and physical examination findings of the patients were reviewed. Ultrasonography and Tc-99m scintigraphy of liver established the diagnosis. Twenty percent hypertonic saline solution was used in all patients to kill all living larvae in cysts and to prevent possible intra-abdominal dissemination during the operations.

The patients were divided into two groups according to the surgical methods employed i.e. whether the residual cavities of cysts were managed with or without drainage. Non drainage methods were used in 210 (67.2%) patients. These included cystectomy in 11 (3.5%), where total removal of the cysts including the outer adventitial layer; omentoplasty in 91 (29.1%), in which a vascular omental pedicle was used to fill remaining cavity after removal of cyst contents; capitonnage in 55 (17.6%), where the sidewalls of the remaining cavity were sutured to its base by folding over the sidewalls themselves to diminish the cavity volume after removal of the cyst contents, and capitonnage with omentoplasty in 53 patients (20%). Surgical methods with drainage of cystic cavities were used in 102 (32.8%) patients of which external drainage in 74 (23.7%), internal drainage in 7 (2.2%) (omega cyst-jejunostomy in 4 and Roux-en-Y cyst-jejunostomy in 3), and combined methods in 21 (6.7%) were used (Table 1). Drainage of the peritoneal cavity was used in 207 patients. The Intra-abdominal cavity was drained in only 5 of 91 patients who had omentoplasty alone.

Early or late postoperative complications, postoperative hospitalisation periods, recurrence and mortality rates were taken into consideration in order to evaluate the outcome of different surgical methods. Recurrence was defined as any hydatid cyst formation within the

Table 1
Types of operative management

Management without drainage	n	Management with drainage	n
Cystectomy	11 (3.5%)	External drainage	74 (23.7%)
Omentoplasty	91 (29.1%)	Internal drainage	7 (2.2%)
Capitonnage	55 (17.6%)	-Omega cyst-jejunostomy	4 (1.3%)
Capitonnage + Omentoplasty	53 (20.0%)	-Roux en Y cyst-jejunostomy	3 (0.9%)
		Combined drainage	21 (6.7%)
Total	210 (67.2%)	Total	102(32.8%)

abdominal cavity. Each patient was followed by regular ultrasonographic and physical examination at six month intervals.

Student-t, chi-square and Fischer's chi square tests were used for statistical analysis. P values of <0.05 was considered significant.

Results

Surgical management was applied to a total of 452 cysts in 312 patients included in the study. The median age of patients was 27.5 (20-72) years. One hundred and ninety-one patients were male and 121 were female. The most frequent symptoms were abdominal pain in 246 (78.7%) and sensation of abdominal fullness in 96 (30.7%) patients (Table 2). The most frequent clinical findings were hepatomegaly in 203 (65%) and abdominal mass in 111 (35.5%) patients. There were no abnormal clinical findings in 18 (5.8%) patients (Table 3).

Table 2

Symptoms	No. of patients	Ratio (%)
Abdominal pain	246	78.7
Abdominal fullness and mass	96	30.7
Lack of appetite and dyspepsia	59	18.9
Weakness and weight loss	45	14.4
Nausea and vomiting	33	10.6
Side pain	19	6.1

Table 3
Clinical findings in patients with hydatid disease of the liver.

Clinical Findings	No. of patients	Ratio (%)
Hepatomegaly	203	65.0
Abdominal mass	111	35.5
Abdominal tenderness	104	33.3
Normal	18	5.8

All patients underwent ultrasonographic imaging of the abdomen in order to reveal the disease in the liver. The diagnostic value of this method was 96.6% in 302 of 312 patients. One hundred and fifty nine patients were examined by Tc⁹⁹ scintigraphy of liver and corrected diagnosis has been obtained in 156 with a diagnostic value of 98.1%.

One hundred and eighty-six of 452 cysts were localised in the left lobe and 266 were in the right lobe. The size of the cysts were 0-5 cm in diameter in 108, 6-10 cm in 207, 11-15 cm in 67, 16-20 cm in 58 and over 20 cm in 12 of cysts. The average size of cysts were 9.9 cm and 7.8 cm in groups with and without drainage respectively. There was no significant difference between groups ($p>0.05$). Single cyst was found in 236 patients. Two cysts in 61, three in 20, four in 6 and five in 2 patients were present. The average number of cysts was 1.7 and 1.3 in groups with and without drainage respectively. There was no significant difference between groups ($p>0.05$).

The median size of the cysts were 9.5 cm in the group without drainage and 15 cm in the group with drainage. Statistically there was no significant difference between the groups ($p>0.05$).

There was no postoperative complication in 222 (70.9%) of 312 patients but a total of 98 postoperative complications were seen in 90 patients. The commonest were secondary bacterial infection of the residual cavity (confirmed by purulent discharge through the drains placed in the cystic cavity, continuous biliary leakage and formation of intra-abdominal abscess), wound and respiratory infections (Table 4). Sixty-nine (67.6%) of all complications were seen in 65 (63.7%) patients who had been managed with drainage. There were no postoperative complications in 11 patients with cystectomy. There was no significant difference among groups who had different types of surgical management without drainage ($p>0.05$).

The complication rate in the group with drainage was significantly high ($p<0.001$). The main complications in this group were secondary infection of residual cavity and biliary leakage. In 95 patients who underwent surgery with external drainage, the median removal period of the drain was 26.5 (14-90) days.

Two patients with drainage required further surgery as a result of postoperative intra-abdominal abscess formation, one of whom died later due to septic complications. The mortality rate was nil in the group without drainage, and 0.9% in the group with drainage. There was no significant difference between these two groups ($p>0.05$).

The median postoperative hospitalisation periods were 26.5 days in the group with drainage and 9.5 days in the group without drainage. The difference between groups was statistically significant ($p<0.001$).

In order to evaluate the long term results of different surgical methods, 283 patients were followed to detect possible recurrences as described above. The median period of follow-up was 46.5 (11-92) months. Recurrence was revealed in 12 (12.6%) of 95 patients who underwent a surgical operation with drainage and in 21 (11.2%) of 188 patients without drainage. There was no significant difference between the surgical methods with or without drainage from the aspect of recurrence ($p>0.05$). The total postoperative hospitalisation period, the rates of complication, recurrence and mortality are shown in Table 5.

Discussion

The current therapeutic management of hepatic hydatid cysts is still by surgical means. Adequate therapeutic results have not been achieved yet by chemotherapeutics using mebendazole and albendazole alone (6,7). The priority in the surgical management of the non-complicated cysts is removal of entire cyst with its contents. Various surgical methods such as partial hepatic resection, pericystectomy, and cystectomy can be

employed. If the cavity is small enough, it can usually closed primarily. For large cavities, various techniques such as omentoplasty, myoplasty, introflexion, capitonage, and marsupialization can be applied (8). The cystic cavity remains and requires to be drained, this can be done either internally or externally. Internally, the cavity can be drained into the peritoneal cavity, biliary tract or a part of gastrointestinal tract such as stomach and small intestine. Closure of a cystic cavity without drainage is also obtained by filling the cavity with scoliced solution and primarily closing the adventitia. Percutaneous drainage techniques were also described (9,10).

The most serious postoperative complications seen after the hepatic hydatid cyst surgery are superinfection of the residual cavity, formation of an intra-abdominal abscess and continuous biliary leakage (11,12). Xynos and colleagues (12) reported that they have seen external biliary fistula formation and infection of the residual cavity as postoperative complications in 2% of patients with omentoplasty and in 56% of patients with external drainage in a series of 155 patients. Rakas and colleagues (11) also reported complication rates of 16% and 8.2% after the operations with and without drainage respectively. Both authors recommended that external drainage should be avoided where possible except for the patients who had pre-operative complications. In our study, the rates of superinfection of the residual cavity, biliary leakage and intra-abdominal abscess development were 12.7%, 29.4% and 2.0% in patients with drainage and 0%, 1.9% and 0% in patients without drainage respectively.

Another factor which affects postoperative morbidity is the postoperative hospitalisation period (1,2). Montes and colleagues (2) reported a significantly shorter postoperative hospitalisation period in the omentoplasty group when compared to introflexion, and omentoplasty plus introflexion groups in their study of 43 cases. In 1999

Table 4
Postoperative complications* following hydatid cyst surgery of liver.

Operative Methods	Infec. of res. cavity	Biliary leakage	Intraabd. abscess form.	Resp. comp.	Wound infec.	Total No (%)
Without drainage	-	4	-	9	16	29 (13.9)
Cystectomy	-	-	-	-	-	-
Omentoplasty	-	-	-	5	4	9 (9.9)
Capitonage	-	2	-	2	5	9 (16.4)
Capit.+Oment.	-	2	-	2	7	11 (20.7)
With drainage	13	30	2	9	15	69 (67.6)
External drainage	10	24	2	6	10	52 (70.3)
Internal drainage	-	-	-	1	1	2 (28.6)
Combined drainage	3	6	-	2	4	15 (71.4)
Total	13	34	2	18	31	98 (31.4)

Infec.= infection; Res.= residual; Intraabd.= intra-abdominal; Form.= formation; Capit.= capitonage; Oment.= omentoplasty

* Only the number of complications were shown.

Table 5
The outcome of surgical methods

Operative Methods	No. of patients	Complications* (%)	Hosp. period (days)	Recurrence (%)	Mortality (%)
Without drainage	210	12.5	9.5	11.2	-
Cystectomy	11	-	12.5	-	-
Omentoplasty	91	8.8	9.0	5.0	-
Capitonnage	55	14.5	11.5	24.5	-
Capit.+Oment.	53	18.9	12.0	10.4	-
With drainage	102	63.7	26.5	12.6	0.9
External drainage	74	67.6	32.0	11.6	1.3
Internal drainage	7	28.6	12.5	14.3	-
Combined drainage	21	61.9	21.5	15.8	-
Total	312	29.1	19.0	11.7	0.3

Hosp.= hospitalisation; Capit.= capitonnage; Oment.= omentoplasty
* Only the number of patients who had complications were shown.

Elhamel (13) found an average postoperative hospitalisation period of 15.3 days in patients who had pericystectomy without drainage. Aktan and colleagues (1) found the average postoperative hospitalisation periods to be 12.8 and 19.8 days in cases who underwent omentoplasty and external drainage respectively. In our study, we found median postoperative hospitalisation periods of 26.5 and 9.5 days in surgery groups with and without drainage respectively.

Recurrence is one of the most important problems in the surgical management of hydatid disease of the liver and is either due to the overlooking of ill-located and small sized cysts during the operation where they become symptomatic later or to new cyst formation from live scolices left at the operation. Ozmen and colleagues (3) in their study of 38 cases in which partial cystectomy, introflexion and omentoplasty were applied, followed their patients for up to 2.7 years and detected no recurrence. Magistrelli and colleagues (14) have recorded that they applied conservative methods (capitonnage and partial cystectomy) to 71 cases and radical methods (total pericystectomy, subtotal pericystectomy and wedge or major hepatic resection) to 64 cases and established the best results in those cases in which radical methods were applied. In our study, we followed the patients for an median duration of 46.5 months and obtained a recurrence rate of 11.7% where no significant difference ($p>0.05$) between groups (12.6% and 11.2% respectively) was found.

In the patients with hyatid disease of the liver, surgical management has to be applied as soon as the diagnosis is established, and before any complication develops. Furthermore, external drainage of the residual cavity in non-complicated cysts significantly increases the postoperative morbidity rates. External drainage on the

other hand has an increased morbidity rate but it should still be the method of choice for complicated cysts such as infection. In patients in whom the residual cavity is closed without drainage, postoperative morbidity is found to be significantly less. Although this study is not a prospective controlled one, the superior outcome of the surgical procedure without drainage is clearly favourable in patients with uncomplicated cysts. It is concluded therefore that the use of surgical methods without drainage procedure such as cystectomy, omentoplasty and capitonnage would be the best choice for the management of uncomplicated hydatid disease of the liver.

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