

Outcomes of Laparoscopic Management of Hydatid Liver Disease

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Abstract

Background: Human hydatid disease or cystic echinococcosis is parasitic disease of world-wide distribution. Laparoscopic management of hepatic hydatid disease has been progressively promoted because of several advantages of minimally invasive surgery over open surgery with comparable results and also it will bring a great improvement in outcomes of surgery for patient as well as doctors. Hence the present study was undertaken to evaluate the outcomes and effectiveness of laparoscopic management of hydatid disease of liver

Methods: Fifty cases of hepatic hydatid disease were operated on laparoscopically using the Palanivelu Hydatid System (PHS) with different methods of cyst management. Various parameters of surgery were compared to open surgery parameters from relevant literatures.

Results: The majority of patients presented with abdominal lump and pain (70%). Most of the patients had only single cyst (70%). The right lobe of liver was most

commonly involved (78%). After evacuation by PHS, deroofing of the cyst, total/partial pericystectomy or marsupialization of the cyst was done laparoscopically. The remnant cavity was dealt with by omentoplasty. The outcomes and efficacy of laparoscopic surgery found to be outdoing as for lesser operative time, lesser postoperative complications and a lower recurrence of disease as compared to open surgeries as mentioned in the relevant literatures.

Conclusion: Thus, laparoscopic management of hydatid liver disease seems to be a better, safe and effective modality of treatment as compared to open surgery.

Keywords: Echinococcosis, Hydatid disease, Pathology, Laparoscopy, Palanivelu Hydatid System, Pericystectomy, Omentoplasty

Introduction

Echinococcosis (Hydatid) is an ancient disease from the time of Hippocrates, who verbalized this pathology as "liver full of water" [1]. It is an endemic parasitic disease in several parts of the world including the Indian

subcontinent. However, physicians and surgeons worldwide may encounter the disease sporadically because of increased travel and immigration [2]. In India, relatively large number of cases are reported in Andhra Pradesh, Tamil Nadu, and Maharashtra than other states [3].

The hydatid cysts occur most commonly in the liver (50–75 %) followed by lungs (25 %), and 5–10 % distribute along the arterial system to other organs of the body [4, 5]. Hydatid disease of the liver (HDL) is caused by the parasite, *Echinococcus granulosus*, a cestode that lives in the small intestine of dogs and other canines. Eggs are eliminated in the faeces and when ingested, liberate their larvae in the duodenum of an intermediate host which can be sheep/goat (pastoral hydatidosis) or reindeer/moose/caribou (sylvan hydatidosis). Humans are accidental intermediate hosts. The larvae cross the intestinal wall and via the portal system reach the hepatic sinusoids where they develop into cysts [6, 7].

The hydatid cysts in humans if left untreated, the cyst grows at the rate of 1cm/year and result in following consequences: patient complains of abdominal lump and discomfort, the lump later forms fistulas into adjacent organs or the biliary system, ruptures into the peritoneal cavity causing seeding of multiple daughter cysts throughout the peritoneal cavity, developing daughter cysts within or rarely dying denovo. Older cysts have an increased risk of exogenous daughter cyst formation, which is an important factor for recurrence of disease after surgery [8, 9].

Moreover, the liver hydatidosis can cause dissemination or anaphylaxis after a cyst rupture into the peritoneum or biliary tract. Infection of the cyst can facilitate the development of liver abscesses.

Considering the above serious complications and the frequency of discomfort in patients of Hydatid disease,

the treatment is mandated necessary. The modern treatment of hydatid cyst of the liver varies from surgical intervention to percutaneous drainage or medical therapy while surgery being the principal modality of treatment for HDL. Laparoscopic management of hepatic hydatid disease has been progressively promoted in the last decade because of several advantages of the minimally invasive surgery over open surgery with comparable results [10]. However, the laparoscopic management will bring a great improvement in outcomes of surgery for patient as well as doctors especially of the like of post-operative pain in patient, post-operative hospital stay, operative time, intra operative complications and conversion of laparoscopic case to open. Laparoscopic management has the advantage of protection from direct spillage of the parasite which has the risk of infecting the treating doctor as well as the assistants in an open surgery. Therefore, present study has been conducted to evaluate the outcomes and effectiveness of laparoscopic management of Hydatid disease of the liver.

Methods

This prospective observational study was conducted in total 50 patients of either sex, aged between 18 to 60 years, presented with echinococcal cyst of size > 5cm and who willing to give written informed consent. Exclusion criteria were deep-seated cysts; posteriorly located cysts (segments I, VII and VIII), cysts <4cm in diameter, cysts with calcified walls and more than 3 cysts and patients unfit for general anaesthesia. A written informed consent was obtained from all the patients. The diagnosis of echinococcal cyst was based on history, physical examination, ultrasound (US), and computed tomography (CT) scan. Patients were operated for cystic echinococcosis of liver laparoscopically with different techniques decided intraoperatively after evacuation of cystic contents by the Palanivelu Hydatid System (PHS).

Omentoplasty was done for all cases. All post-operative care was given considering the ERAS protocol.

The operative time, postoperative complications and recurrence of disease were noted and compared to open surgery parameters from relevant literatures. All the operated cases were followed up at 7 days, 30 days, 6 months and yearly thereafter during the study period. Ultra-sonography was performed 6 months after the surgery and yearly thereafter to assess residual or recurrent cysts and success of surgical procedure. If clinically indicated, US repeated at shorter intervals. CT scan was performed if any complication/recurrence was suspected.

Statistical analysis

The data were collected and entered in Microsoft Excel sheet and then statistically analyzed using SPSS Version 20.0. Continuous variables were expressed as mean ± SD and categorical variables were summarized as frequencies and percentages.

Results

Total 50 patients aged between 18 to 60 years presented with hydatid liver disease were enrolled in the study. Out of 50 cases, 21 (42%) were males and 29 (58%) females. The majority of patients (26%) were from the age group of 51 to 60 years (26%) followed by 31 to 40 years (24%) as shown in table 1. A greater proportion of patients (68%) belonged to lower socioeconomic class and 16 (32%) belongs to middle class. Most of the patients were agriculturists (44%) followed by labourers (22%), housewives (16%), others (12%) and students (6%). History of contact with sheep or dogs was present in 16 patients (32%).

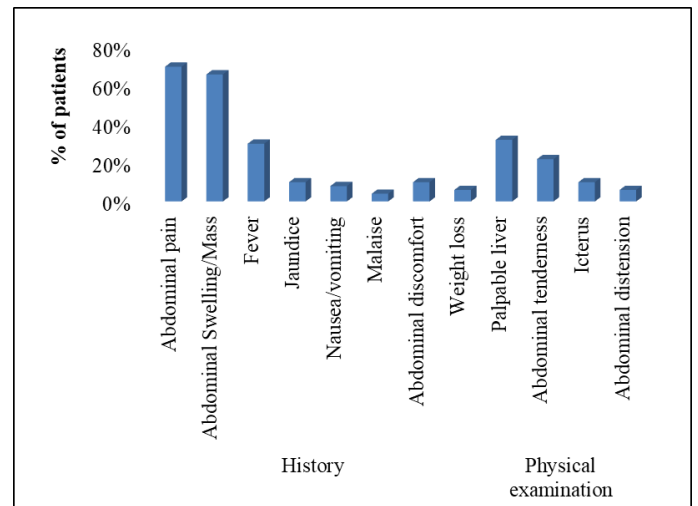
Table 1: Distribution of patients according to age group

Age (Years)	No. of patients	Percentage
18-20	05	10

21-30	09	18
31-40	12	24
41-50	11	22
51-60	13	26

Most of the patients presented with a complaint of abdominal pain (70%) followed by abdominal mass (66%). However, the most common physical finding was a palpable liver (32%), followed by abdominal tenderness (22%) as shown in figure 1. Long standing illness more than 3 years was seen in 4 patients (8%). 07 patients (14%) had symptoms lasting from 1 to 3 months.

Figure 1: Clinical profile of patients



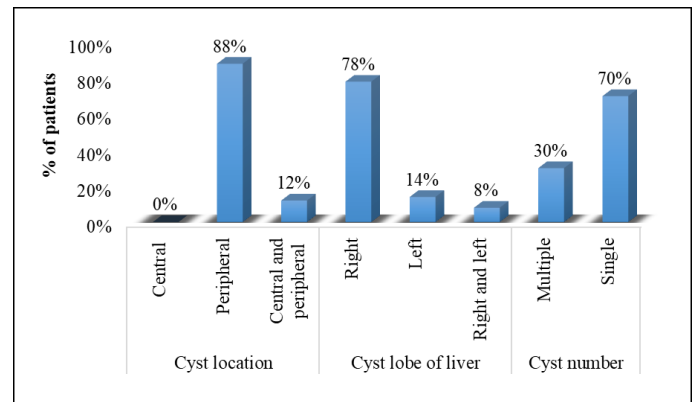
The unilocular simple cystic lesion being the most common USG (48%) and CT findings (44%). However, a greater proportion of cyst with heterogenous contents were detected with CT (16.00%) as compared to USG (12%). The other types of cysts observed on USG and CT scan are presented in table 2. The maximum dimension of the cyst in USG was 13.2 cm, whereas the minimum dimension was 3.2 cm. Similarly, the maximum and minimum dimensions of the cyst in CT imaging were 17.3 cm and 2.7 cm, respectively.

Table 2: Cyst characteristics in USG and CT abdomen

Cyst characteristics		No. of patients	%
USG abdomen	Unilocular anechoic cystic lesion	24	48
	Multiseptated cyst	07	14
	Cyst with detached membranes	05	10
	Cyst with daughter cysts	05	10
	Cyst with heterogenous contents	06	12
	Calcified wall	00	0.00
	Features suggestive of infection	03	06
	CT abdomen	Unilocular simple cystic lesion	22
Multiseptated cyst		07	14
Cyst with detached membranes		05	10
Cyst with daughter cysts		05	10
Cyst with heterogenous contents		08	16
Calcified wall		00	0.00
Features suggestive of infection		03	06

Most of the cyst were located in peripherally (88%). The right lobe of liver was most commonly involved (78%). Maximum patients had only single cyst (70%) as depicted in figure 2.

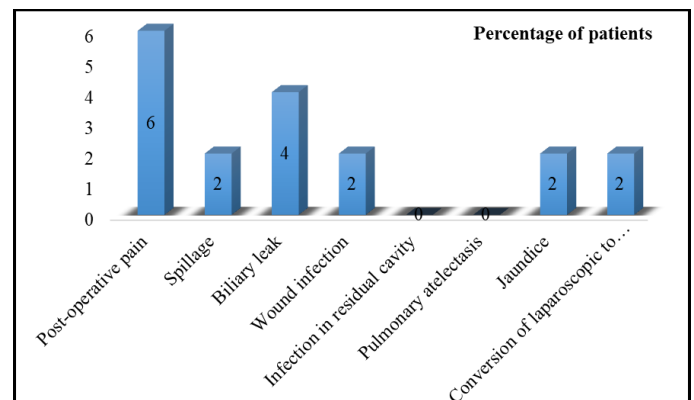
Figure 2: Cyst location, cyst lobe of liver and cyst number



The maximum number of patients i.e., 28 (56%) underwent laparoscopic deroofing of the cyst (LDC) with omentoplasty. 12 patients (24%) underwent laparoscopic partial cystectomy (LPC) with omentoplasty. 4 patients (8%) underwent laparoscopic total cystectomy (LTC) with omentoplasty. Six patients (12%) underwent marsupialization of the cyst.

Post-operative complications were seen in 16% of the patients and most common complication was postoperative pain (6%) as depicted in figure 3.

Figure 3: Postoperative Complications



On follow up- 40 patients had no residual cavity at post-operative day 7 and at the end of first month, while the number raised to 43 at the end of 6 months and then to 44 at the end of 1 year. Decreasing residual cavity was seen in 6 patients at the end of 7 days and at the end of 1 month, 2 patients at the end of 6 months and 1 patient at the end of 1 year of follow up. One patient had a gradual

increase in the size of the cavity i.e., recurrence of disease, at the end of 6 months and persisted till the end of study. 4 patients were lost to follow up.

The laparoscopic surgery outcomes showed that the lesser operative time, lesser postoperative complications, and a lower recurrence of disease as compared to open surgery as shown in table 3.

Table 3: Outcomes of laparoscopic management compared to open surgery parameters from relevant literatures

Outcomes	Lap	Open surgery			
	Present study	Patel et al [104]	Bektasoglu et al [105]	Nooghabi et al [110]	Bostanci et al [111]
Operative Time (min)	90.0± 14.3	137.5±20.22	113 ± 63	115.71±27.86	144±19
Post-op complications (%)	16%	20%	27%	45%	19%
Recurrence (%)	2%	-	8.3%	-	-

Discussion

Hydatid disease is a major health problem in endemic areas and liver is commonly affected organ that accounts 70% of the cases [11, 12]. The commonly affected age group is 25-45 years of age [13] but the maximum cases involved in the current study belonged to 6th decade of life with a slight female preponderance which is consistent with the previous studies [12-14]. In India, the female population is actively involved in household chores, agriculture, and animal husbandry. This practice is significant in rural parts of the country. This may be the reason for the female population having greater exposure to the parasite and developing HCL. Most of the patients were from the low socio-economic status group (68%). This is comparable with the Shaikh AS et al study (68.57%) [15]. Agriculture was the most common occupation of patients (44%) followed by labourers (22%) which is similar to the study done by Upadhyaya HG et al [16]. History of contact with dog or sheep was present in 32% of patients which is comparable with other studies [17, 18]. This shows that the absence of history of contact with animals is not very

significant as a majority of our patients (68%) as well as patients in the above compared study had the disease without history of contact with animals. This may be attributed to the chance of indirect contact with animals while consuming vegetables or food contaminated or soiled with animal wastes or unhygienic practices followed in rural setups and in lower socioeconomic groups which could not be elicited directly in history.

Pain in abdomen (70%) and mass per abdomen (66%) were the most common complaints at presentation. This corresponds in line with other studies [15, 19]. The presentation of cases with mass could be due to the fact that most patients neglected their aching pain or took on the counter analgesics and never consulted their doctors due to ignorance or low financial status. The most common physical finding was a palpable liver (32%), followed by abdominal tenderness (22%). This result is comparable with the study conducted by Joshi U et al [13] and Hazra et al [20]. The maximum number of patients (30%) had illness lasting from 6-12 months, followed by 1-3 years (26%) and 3 to 6 months (22%). Long standing illness more than 3 years in 8% cases. 14% had symptoms lasting from 1 to 3 months. Similar findings are reported in Shaikh AS et al study [15].

However, the most common USG finding was the unilocular and anechoic appearance of the cyst, followed by the heterogeneous echoic pattern within the cyst which is correlated with the study done by Niron et al [21]. The CT imaging in current study population also corroborates our USG findings, with the unilocular, simple cystic lesion being the most common finding which corroborates with the findings of Suwan et al [22]. CT scan is superior to USG in detecting minute calcifications within the cysts, whereas USG better visualizes the active stages of the cyst [22]. Most of the cyst were located in peripherally (88%). The right lobe of

liver was most commonly involved (78%). Maximum patients had only single cyst (70%). These findings are comparable with the previous studies [13, 23]

In the present study we used Palanivelu hydatid system for cyst evacuation and aspiration and only 2% patients had the complication of spillage of cyst contents. Laparoscopic de-roofing of the cyst with omentoplasty was the most common procedure done followed by laparoscopic partial cystectomy with omentoplasty which shows similar trend as of other studies like Shaikh AS et al [15] and Yagci et al [24].

The mean operative time was 90.0 ± 14.3 minutes from port incision to closure which in less than time required for open surgeries as mentioned in the relevant literatures [12, 23]. Lesser operative time is very much beneficial as it decreases the chances of infection, exposure to the doctors as well as decreases the anaesthesia time which has better postoperative outcomes for the patient. Therefore, laparoscopic approach for the surgical treatment of liver hydatidosis is better than open surgeries with respect to the operative time required. Intra-operative and post-operative complications are indicators of success of laparoscopic procedures and have a major impact on the surgical outcome as well as cure of the illness. In the present study, post-operative morbidity and complications were very less. 16% patients developed minor complications. Recurrence was found in only 2% population. No mortality was seen in the study group. These findings are comparable with the study done by Tuxun et al [11] and Shaikh AS et al [15].

Conclusion

In our experience as compared to open surgery, patients who undergo laparoscopic surgery for hydatid disease of liver have lesser operative time, lesser post-op complications and lower rates of recurrence. Thus, laparoscopic management of Hydatid liver disease seems

to be a better, safe and effective modality of treatment as compared to open surgery.

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