



Laparoscopic Versus Conventional Surgery for Hepatic Hydatid Disease: A Comparative Study

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Abstract

Background: laparoscopic treatment of hepatic hydatid disease has undergone revolution in parallel to progress in laparoscopic surgery. Controversies about the role laparoscopy in the management of liver hydatid cyst have not been resolved because of scarce experience worldwide.

Objectives: The aim of our study was to compare surgical outcome of laparoscopic approach with open surgery for the management of hepatic hydatid disease.

Methods: It was a retrospective and prospective study conducted in the department of surgery SKIMS Srinagar over a period of eight years from January 2008 to January 2016 in Sheri Kashmir institute of medical sciences Srinagar India, Srinagar. The study included all the adult patients admitted with a diagnosis of hepatic hydatid disease and the total number of patients studied was 80. All patients were pre-operatively and post-operatively treated with Albendazole. The patients were alternately taken either for laparoscopic approach or for open approach. For data that was included retrospectively patients were enrolled in either groups based upon the type of surgery they had undergone. Patients were followed for any recurrence for a period ranging from one year to six years with an average follow up period of 24 months. All the data was entered in detailed proforma and analysed.

Results: Mean age of presentation was 40.27 years in open group and 38.80 years for laparoscopic group. Majority of patients (55%) presented with pain abdomen. Mean operative time was 60.43 minutes in open group and 89.80 min. for laparoscopic group. Two patients (5%) from the laparoscopic group had to be converted to open. In laparoscopic group mean hospital stay was 3.40 days while in open group it was 8.73 days. Mean time to return to work was 8.10 days in laparoscopic group and 20.70 days in open group. In laparoscopic group none of the patients had surgical site infection while as in open group 4 (10%) had surgical site infection. In laparoscopic group, biliary leak was seen in 3 (7.5%) patients, while in open group it was seen in 2 (5%) patients. Recurrence was seen in 2 (5%) patients who underwent open surgery, while as recurrence was not seen in any of the patients who underwent laparoscopic surgery.

Conclusions: Based on our encouraging results from our current study, we conclude that laparoscopic hydatid surgery is safe and feasible for selected patients in which criteria is met, motivated primarily by lower post-operative morbidity, mortality and recurrence.

Keywords: Hydatid Disease, Biliary Leak, Recurrence, Albendazole

1. Background

Hydatid disease is endemic in several parts of the world which include Mediterranean countries, North Africa, Middle-East, Indian sub-continent, Northern China, Philippines, but due to increased travel, physicians and surgeons may encounter disease sporadically (1, 2). There are four known forms of echinococcosis in humans. Among them echinococcus granulosus is most common cause of hydatid disease. Although all the tissues can be affected but liver is affected in 75% of cases, lung in about 10% - 15% and

other organs in 5% - 10% (3). Right lobe of liver is commonly involved (4). A visible hydatid cyst develops after three weeks of infection in spherical manner. A pericyst, a fibrous capsule derived from host tissue develops around hydatid cyst. The cyst wall itself has two layers outer ectocyst and inner endocyst. The incidence of *E. Granulosus* in endemic areas range from 1 to 220 cases per 100,000. Hydatid liver disease affects all age groups and both sexes equally. Most commonly involved age group is third and fourth decade of life in endemic areas. The clinical features

of liver hydatid depend on the size, number, vitality and stage of development of cyst. The diagnosis of liver hydatid cyst is established by Para-clinical investigations, especially imaging techniques such as ultrasonography, conventional radiology, and computed tomography as well as by immunological studies. Although treatment options of hydatid disease of liver have increased over the last two decades, including medical treatment, percutaneous drainage or combination of two modalities, surgery remains mainstay of the therapy. Many surgeons have tried laparoscopic intervention for hydatid cyst of liver and have had results comparable to open surgery, with added benefits of minimally invasive surgery.

The authors have conducted this study with the aim to compare results of laparoscopic approach with open surgery for the management of hepatic hydatid disease.

2. Methods

The study was conducted in department of general and minimal – access surgery, SKIMS Srinagar, India from January 2008 to June 2016 on eighty patients with hydatid cyst liver. The study was retrospective and prospective in design. In the retrospective study records of the entire patient admitted with a diagnosis of hydatid cyst liver from January 2008 to May 2014, was obtained from the medical records department of the hospital. The data was studied and analysed as per the proforma. The prospective study was conducted on all the adult patients admitted in the hospital from June 2014 to June 2016 with the diagnosis of hydatid cyst liver. The study included all adult patients with the cysts located in segment 3,4,5,6 and 8, with no evidence of calcifications, major biliary communication or cyst infection.

The patients which were excluded from the study included Cyst located in segment 1, 2, and 7 of liver, multiple liver hydatid cyst or cyst located near vascular liver element, Intra-parenchymal cysts, patients having severe cardio-pulmonary disease, recurrent and ruptured hydatid cyst of liver and previous multiple upper abdominal surgery.

All patients underwent complete work-up which includes history, general physical examination, routine haematological tests, ultrasonography, computed tomography and serological examination. The patients were prepared for surgery and underwent respective procedure after taking informed consent from all patients. Using simple random method, patients were randomly allocated into two groups: study group (laparoscopic group) and control group (open group). During surgery findings like intra-operative spillage, any anaphylaxis and operative

time was noted. Post-operatively, patients were meticulously managed and monitored for any anaphylaxis, surgical site infection, biliary leak, increased duration of hospitalization and others.

In all patients Albendazole therapy was given for one month pre-operatively and for two months post operatively in the dose of 10 mg per kg body weight. Patients were followed over the period of two years for any recurrence at two month interval in out-patient department. Liver function test, Complete blood count and ultrasonography were performed on each visit. All data was entered in detailed Proforma and analysed.

2.1. Surgical Technique

Surgical procedure is initiated by creating pneumoperitoneum, and then inspection of abdomen is done to look for any other cyst or any associated finding. After identifying the cyst, two cetrimide soaked gauze packs are put around the cyst. Suction cannula is introduced into the cyst, around 60% - 70% of hydatid fluid is sucked out, then scolicedal agent is injected into cyst and kept for 10 - 15 minutes, then the suction was again done in the cavity. The cyst wall is opened by thermal cautery; again suction of residual contents is done.

Laparoscopic camera is introduced into cyst cavity to look for major cyst biliary communication and any side wall cysts. Laminated membrane are delivered into sterile bag and then delivered outside. Again cyst cavity is examined, then omentopexy is done, suture or clip is applied for holding. Drain is put in and fixed, port site sutured and ASD is done.

3. Results

Total number of patients included in this study was eighty. Forty patients were taken for laparoscopic surgery and another forty were taken for open surgery. Mean age of patients in laparoscopic and open group was 40.27 and 38.80 years respectively. In laparoscopic group, 19 patients were male and 21 were female, while as in open group, there were 20 males and 20 females. Abdominal pain was the most common presentation (55%) followed by abdominal mass in 15 % patients (Table 1). Most of the cysts were single, uni-vesicular in both laparoscopic as well as open group, located in right lobe of liver (Table 2). In laparoscopic group biliary leak was most common complication (7.50%), which was treated conservatively and ceased spontaneously after 3 - 4 days, while as surgical site infection was the commonest complication in open group and was seen in 10% patients (Table 3).

Mean operative time for laparoscopic group was 89.80 minutes (60 - 120 minutes) and for open group it was 60.43

Table 1. Clinical Presentation of Patients

Chief Complaints	No. (%) of Patients
Abdominal Pain	44 (55.00)
Abdominal Mass	12 (15.00)
Abdominal mass + pain	12 (15.00)
Asymptomatic	8 (10.00)
Nausea and vomiting	3 (3.75)
Jaundice	1 (1.25)
Total	80 (100.00)

Table 2. Characteristics of Liver Cysts^a

Characteristics	No. Of Patients in Laparoscopic Group	No. of Patients in Open Group
TYPE of cyst		
Univesicular	34 (85)	31 (77.50)
Multi vesicular	6 (15)	9 (22.50)
Number of cysts		
1	38 (95)	37 (92.50)
2	2 (5)	2 (5.00)
3	0 (0)	1 (2.50)
Site of cysts		
Right lobe	30 (75.00)	28 (70.00)
Left lobe	9 (22.50)	10 (25.00)
Both lobe	1 (2.50)	2 (5.00)

^aValues are expressed as No. (%).

minutes (40 - 80 minutes). Out of 40 patients who were operated laparoscopically, two had to be converted to open. Mean hospital stay of laparoscopic group was 3.40 days (2 - 6 days), while as it was 8.73 days (5 - 12 days) in open group (Table 4). Time for return to work in laparoscopic group was 8.10 days (6 - 12 days) in comparison to open group where it was 20.70 days (10 - 25 days) (Table 5). None of patients in laparoscopic group had recurrence; while as in open group 2 (5%) had recurrence.

3.1. Statistical Analysis

Relevant statistical methods were employed for analysis of the collected data. Student t-test was used for continuous variables and categorical data was analysed by chi-square test. A significant difference is assumed with p value less than 0.05. SPSS (statistical package for social science) version 16 was used for statistical analysis). Appropriate consent in vernacular language was taken from all pa-

Table 3. Comparison of Complications Between Two Groups

Complication	Number of Patients (40)		P Value ^a
	Laparoscopic Group	Open Group	
Anaphylaxis	0	0	1
Surgical site infections	0	4 (10)	< 0.0001
Major Intraoperative spillage	1	1	1
Minor intraoperative spillage	3	2	0.771
Biliary leak	3	2	0.467
Mean operative time	89.80 ± 6.08	60.43 ± 8.56	< 0.0001
Recurrence	0	2	0.024

^aP value < 0.05 (significant).

Table 4. Group Comparison for Hospital Stay (Days)^a

Groups	Hospital Stay, d
Laparoscopic	3.40 ± 1.63
Open	8.73 ± 1.62
P Value	< 0.0001 (significant)

^aValues are expressed as mean ± standard deviation.

Table 5. Group Comparison for Return to Work (in Days)^a

Groups	Return to work, d
	Mean ± Standard deviation
Laparoscopic	8.10 ± 1.83
Open	20.70 ± 2.81
P Value	< 0.0001 (significant)

^aValues are expressed as mean ± standard deviation.

tients. Ethical clearance was sought regarding this study as per the institutional policy.

4. Discussion

Surgery remains the main stay of treatment for hepatic hydatid cyst. Initially, laparoscopy was not accepted or widely used in treatment of hepatic hydatids due to concern that, risk of intra-peritoneal dissemination might be higher with laparoscopy than with conventional approach. In fact, real risk of spillage is lower than that might be expected, and short term recurrence is higher in open

surgery. Laparoscopic approach in hydatid liver cyst has several advantages which include lower morbidity, shorter hospital stay and early return to work.

In our study the mean age of distribution in laparoscopic group was 40.27 years and in open group was 38.80 years, which is in concordance with other studies (5-7). In our study, 47.50% were males and 52.50% were females, this was in concordance with other studies (7). None of patients in our study had Anaphylaxis as was seen in other studies (8). In laparoscopic group none of patients had surgical site infection, while 10% had surgical infection in open group and this was in agreement with other studies (9,10). Major spillage occurred in 2.50% patients and they had to be converted to open and this is in accordance with the study conducted by Baskaran and Patnaik (11). Biliary leak was seen in 7.50% of patients in laparoscopic group and 5% in open group. Similar results have been reported by other studies (8,12). In our study mean operative time in laparoscopic group was 89.80 minutes, while as in open group it was 60.43 minutes. The cause for more time in case of laparoscopic group was our initial experience with the procedure. Other studies had comparable results (7,13). Hospital stay in our study, in laparoscopic group was 3.40 days while as in open group it was 8.73 days, which was in concordance with other studies (5,14)

In our study, mean time to return to work was 8.10 days and for open group it was 20.70 days. This was due to lower morbidity and mortality in laparoscopic group than open group and the results are in accordance to other studies (15,16). Rate of conversion in our study was 5%. Studies conducted by Rooh-ul Muqim (8), had similar conversion rate. In our study, there was no recurrence in laparoscopic group while as in open group 5% had recurrence. Lower recurrence in our study was attributed to use of Albendazole pre and post operatively in patients of hepatic hydatid cysts. Various studies (17) have shown zero recurrence rates in patients treated with Albendazole pre and post operatively.

Surgical site infection, hospital stay, returns to work and recurrence were significantly reduced with laparoscopic group. These parameters define a reduced post-operative bedridden state with improved sense of wellbeing for patients. However there is no significant difference in rate of anaphylaxis, intra-operative spillage, and biliary leak between laparoscopic and open group.

4.1. Limitations

The laparoscopic group would always have theoretical risk of dissemination of parasite which was compounded by the absence of adequate measures such as use of surgical pads soaked in scolicedal agents during open procedure. Our quest for answers to such questions led to an

extensive review of literature and upon evaluation the results of open and laparoscopic procedures are comparable in terms of recurrence and spillage. We took all necessary precautions to reduce spillage, which include use of high pressure suction devices, aspiration and irrigation of cyst few times before extraction of laminated membranes, slow extraction of laminated membrane and daughter cyst and use of laminated membrane for extraction of laminated membrane.

4.2. Conclusions

Based on our encouraging results from our current study, we conclude laparoscopic hydatid surgery safe and feasible in selected patients in which criteria is met, motivated primarily by lower post-operative morbidity, mortality and recurrence rate.

Footnote

Authors' Contribution: Ajaz A. Malik and Munir Ahmad Wani, performed most of the procedure; Idrees Ayoub, compiled the data; Shams Ul Bari designed the study and edited the manuscript.

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