

Laparoscopic Management of Liver Hydatid Cyst: Current Experience of Single Center Study

Laparoscopic Management of Liver Hydatid Cyst

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ABSTRACT

Objective: To evaluate the feasibility and outcome of laparoscopic surgery in properly selected cases of liver hydatid cyst.

Study Design: Prospective study

Place and Duration of Study: This study was conducted at the Department of Surgery, Basrah College of Medicine, Iraq from 1st June 2023 to 30th June 2025.

Methods: In this prospective study, twenty-seven 27 patients with liver hydatid disease were enrolled. All of them had undergone laparoscopic liver hydatid cyst surgical treatment.

Results: There were 17 females and 10 males with mean age 42.48 years. They presented with abdominal pain (19, 70.38%), asymptomatic (6, 22.22%), jaundice (2, 7.4%). There were 4 (14.81%) cases of cystobiliary communication; 2 patients with jaundice were preoperatively detected and treated by endoscopic retrograde cholangiopancreatography, 1 patient was intraoperatively detected during checking the cystic cavity by telescope which was treated by suturing using vicryl 2-0 and 1 patient was detected postoperatively by bile leak through intracystic drain which was treated by endoscopic retrograde cholangiopancreatography. Most patients had cyst size ≥ 8 cm, 17 (62.96%) cases. The mean operative time was 58.89 minutes. The mean Visual Analogue Scale score was 5.19 reflecting moderate severity of pain and thus mean duration of analgesia was 1.15 days and consequently the mean hospital stay was 1.59 days. Postoperative complications were noticed in 4 (14.81%) patients including cavity abscess, atelectasis, port site infection and postoperative bile leak.

Conclusion: Laparoscopic approach for appropriate liver hydatid cyst can be achieved safely with short hospital stay and short duration of analgesia.

Key Words: Liver hydatid cyst, Laparoscopic surgery, Spillage, Cystobiliary communication, Biliary leak

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INTRODUCTION

Surgical treatment is an essential modality for treatment of liver hydatid cyst (LHC). Additionally, albendazole pre- and postoperatively plays an important adjunct role to prevent recurrence.¹

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The surgical intervention includes different options for cyst treatment involving liver hydatid endocystectomy, pericystectomy, segmentectomy and occasionally liver lobectomy.²⁻⁴ Despite effectiveness of open surgical modality, numerous disadvantages are considered like increased pain severity postoperatively due to big incision, a long hospital stay, an increase possibility of wound infections, incisional hernia and bowel adhesions.⁵ After an advent and progressive improvement in laparoscopy, there were many recent published works reporting laparoscopic surgery (LS) for LHC.^{6,7} A reported advantage of LS for LHC is the capability of cyst telescoping to detect any cystobiliary communication or missed germinal membrane and thus avoid biliary leak and recurrence respectively.⁸ But, it is reported that the working area is restricted in comparison to open surgery for cyst manipulation increasing the fear of spillage and its serious consequences like anaphylactic shock and secondary hydatidosis.⁹ Generally, minimally invasive approach makes the post-operative pain lesser, the hospital stays shorter and thus rapid return to work.⁷

METHODS

This prospective study was conducted at Department of Surgery, Basrah College of Medicine, Iraq from 1st June 2023 to 30th June 2025 vide letter No. 1-12-5 dated 1st May 2023. A total of 27 patients who were admitted to surgical wards, were diagnosed as cases of LHC after history and physical examination, then, abdominal ultrasonography and confirmed by contrast abdominal computerized tomography (CT) scan. All patients had undergone elective laparoscopic liver hydatid surgery. Patients with LHC ≥ 5 cm, their ages ≥ 16 years old and fit for general anaesthesia were included. Patients with other types of cysts or recurrent LHC/s were excluded. Albendazole 10 mg/kg/d for 14 days preoperatively given for all patients and then albendazole was taken by all patients for 4 cycles postoperatively.¹⁰ All patients were assessed for risk of general anaesthesia. Explanation of laparoscopic procedure was offered to all patients with possibility of conversion to open procedure and an informed consent was taken from all patients.

Patients' positions were supine for right lobe and trendelenburg for left lobe and pneumoperitoneum was created by using supra or infra-umbilical 10mm port achieving 12 mm Hg, other ports were positioned according to liver lobe affected as follow: in the epigastric region (sub-xiphoid) 12 mm port if the cyst was located in the right lobe and in left flank if cyst was located in the left lobe and 2 further 5mm working ports were positioned depending on liver lobe involved accordingly. An extra port was used according to cyst position to ensure presence of two suction tubes simultaneously during steps of puncture and aspiration to control spillage. Packs soaked with scolicidal agent 10% povidone iodine were placed around cystic area for spillage control. Then, cyst puncture was carefully performed for fluid aspiration and decompression using a special needle with 2 suction tubes was concurrently positioned in nearby area to control spillage. The aspirated fluid was observed for its color to detect any pus that indicated infected cyst or bile suggesting intrahepatic cystobiliary communication. Thereafter, 10% povidone iodine (equal amount of aspirated fluid) was injected inside the cyst and waiting for 10 minutes. Subsequently, aspiration of whole intracystic fluid treated with scolicidal agent. Consequently, cystostomy was achieved using monopolar hook in upper most area of cyst to avoid soiling. Furthermore, cavity was evacuated from the germinal membrane using grasper directly in an endobag. The cystic cavity was telescoped for any residual membrane or intrahepatic cystobiliary communication. If there is communication, then it was closed with 2-0 vicryl stitch. Additionally, deroofting of cyst was performed using ligasure and intracystic drain was used to manage the residual cavity. Subhepatic or subdiaphragmatic drains were

placed accordingly which were removed after 2-3 days while intracystic drains were usually removed after almost 7 days when no drainage. First visit after 2 weeks, then, the schedule was every 6 months for 18 months assessing patients clinically and radiologically for recurrence and cavity status. Follow up includes detection postoperative complications like: bile leak, atelectasis, cavity abscess, port site infection or hernia or recurrence. Pain on first post-operative day was assessed using visual analogue score (VAS) from 0-10 indicating "pain-free" till "worst-pain" respectively. Statistical analysis was conducted using SPSS-26

RESULTS

The mean age was 42.48 ± 13.61 years with range of (16-72). There were 17 (62.96%) females and 10 (37.04%) males with male/female equal to 1:1.7. Table 1 showed that the main presentation was right hypochondrial pain, anorexia and nausea with or without vomiting in 19 patients (70.38%). Then, asymptomatic patients who were accidentally discovered in 6 patients (22.22%). Two patients (7.40%) had jaundice and diagnosed by MRCP. They were successfully treated by ERCP prior LS. No one presented with fever or palpable mass.

Regarding number and site of LHC involved in this study, there were 20 patients (70.04%) representing the majority of patients had single right liver lobe hydatid cyst. Whereas, there were only 2 patients (7.4%) had multiple right liver lobe cysts. However, there were only 2 patients (7.4%) had single left lobe hydatid cyst which is apparently much less than the right lobe. Additionally, there was only 1 patient (3.7%) had multiple left liver cysts. Lastly, there were 2 patients (7.4%) had bilateral right and left lobe liver cysts. These cysts include 22 patients (81.48%) uncomplicated liver hydatid cysts and 5 complicated hydatid cysts; 1 patient with secondary infected liver hydatid cyst and filled with pus and 4 patients (14.81%) with cystobiliary communications (2 of them preoperatively detected by jaundice, 1 patient intraoperatively detected by cavity telescoping and 1 patient 2 weeks postoperatively detected by intracystic bile leak drain). LHC size ≥ 8 cm was reported in 17 patients (62.69%) [Table 2].

Table 3 shows that the mean of operative time for LS for LHC was 58.89 minutes. Regarding the intraoperative complications, interestingly, there were no spillage. Additionally, there were no intraoperative bleeding, anaphylactic shock and conversion to open surgery. However, there was 1 patient (3.7%) had cystobiliary communication detected while telescoping the cyst and treated by suturing using vicryl 2-0.

There were 15 patients (55.55%) spent 1 day in hospital, 8 patients (29.62%) spent 2 days in hospital while there were 4 patients (14.83%) spent 3 days in hospital. The mean of hospital stay was 1.59 days. The

mean of postoperative VAS score for assessing pain severity was 5.19 on the first day of hospitalisation reflecting that the pain was moderate in severity. The mean duration of injectable analgesia was 1.15 days (Table 4).

The postoperative complications were noticed in 4 patients (14.81%). One patient developed cavity abscess which was treated by percutaneous drainage and pigtail drain under ultrasound guide with antibiotics. In addition, there was 1 patient with atelectasis which was successfully treated by conservative treatment. Furthermore, there was 1 patient developed port site infection which was treated conservatively using antibiotics. Interestingly, one patient (3.7%) had bile leak by continuous draining bile through intracystic drain for 2 weeks which was successfully responded to treatment by ERCP. It is important to find that there was no case of recurrence during period of follow up stated in methodology (Table 5).

Table No. 1: Main presentations of patients with LHC

Symptoms	No.	%
Right hypochondrial pain, anorexia and nausea with or without vomiting	19	70.38
Symptomless	6	22.22
Palpable mass	-	-
Fever	-	-
Jaundice	2	7.4

Table No. 2: Number, location, size and type of LHC

Parameters	No.	%
Single cyst in R lobe	20	74.04
Multiple cysts in R lobe	2	7.40
Single cyst L lobe	2	7.40
Multiple cysts in L lobe	1	3.70
Bilateral	2	7.40
Uncomplicated	22	81.48
Complicated		
Cystobiliary communications	4	14.81
Secondary infection	1	3.71
Cyst size (cm)		
5- <8	10	37.04
≥ 8	17	62.96

Table No. 3: Mean operative time and intraoperative complications

Parameters or variables	
Operative time in minutes	58.89±8.01
Intraoperative spillage	-
Bleeding	-
Anaphylactic shock	-
Cystobiliary communication	1 (3.7%)
Conversion to open	-

Table No. 4: Shows duration of hospitalization stay, mean of hospital stay, mean of analgesia and VAS score on day one

Parameter		Patients underwent surgery	%
Hospital stay (days)	1	15	55.55
	2	8	29.62
	3	4	14.83
Mean of hospital stay in days	1.59± 0.75		
Mean of analgesia in days	1.15± 0.36		
Mean of VAS score on first day	5.19±1.04		

Table No. 5: Postoperative complications

Post-operative complications	No.	%
Cavity abscess	1	3.7
Atelectasis	1	3.7
Port site infection	1	3.7
Port site hernia	-	-
Bile leak	1	3.7
Recurrence	-	-
Total	4	14.81

DISCUSSION

It is evident that surgery often representing the crucial approach of treatment involving both open and laparoscopic techniques^{8,10} preserving medical therapy like albendazole for specific indications including prior and post-surgical intervention to prevent recurrence particularly if there is intraoperative spillage or in patients unfit for surgery.⁶ There is a recent rise of clinical tendency to manage liver hydatid cyst laparoscopically especially after raising surgeons' experience worldwide.^{6,7,10}

In the current study, the mean age was 42 years old which is consistent with many other studies.^{6,11} In our study, female percentage was more preponderant than males and this comes in accord with other study¹² and in contrast with others that report both sex equivalency¹¹ or male predominance.⁶

In this study, the commonest presentation was upper abdominal pain (70.38%) which is consistent with other studies.^{6,12} Additionally, 22.22% of our patients were asymptomatic and were detected accidentally which is similar to other study.⁶ In current study, the least presentation was jaundice 7.4% of patients with no fever or palpable mass. In contrast, Palanivelu et al⁶ report that 13 patients out of 66 total number in their series (19.7%) are presented with abdominal mass.

In present study, a single cyst in right hepatic lobe was more predominant. This is similar to the results of other published studies.^{6,7,11} There were 4 cases (14.81%) of cystobiliary communication. This is consistent with the rate of cystobiliary communication reported by other studies which ranges between 3.5%¹³ and 19%.¹⁴

Presence of cystobiliary communication is preoperatively confirmed by proper history and examination (jaundice and cholangitis), LFT and MRCP showing CBD dilatation together with presence of liver hydatid cyst.¹⁵

In the present study, the size of cyst in majority of patients (62.96%) was ≥ 8 cm. In contrast to study conducted by Masood et al⁷ who report that the number of patients with cystic size ≤ 10 cm are nearly similar to patients with cystic size > 10 cm despite the mean size of cyst is 8.8 ± 2.39 cm in their series. Kilic et al¹⁶ showed that the mean size of cystic lesion is 10.2 cm in cases with bile leak whereas it is 6.2 cm in cases without bile leak raising the likelihood that the cystic size is a risk factor for cystobiliary communications.

In current study, the mean operative time of LS for LHC was 58.89 minutes which is comparable to other studies conducted by Palanivelu et al⁶ and Shi¹⁷ and who report that the mean operative time is 57.19 minutes and 52 minutes respectively. However, it was less than other studies conducted by Masood et al⁷ and Minaev et al¹⁸ in which the operative time is of 104 minutes and 90 minutes respectively suggesting that the LS for LHC becomes shorter when it is used in less complex cases.

Intraoperatively, many incidental complications have been reported in other reports like spillage, bleeding, anaphylactic shock, cystobiliary communications.¹⁹ No one of these complications had been detected in our study except one case (3.7%) of cystobiliary communication discovered intraoperatively during cystic examination by telescope. Bektasoglu et al¹⁹ report that there are 3 patients out of 23 patients (13%) who are treated laparoscopically are converted to open surgery and 1 patient with anaphylactic shock. In contrast, neither conversion to open surgery nor anaphylactic shock had occurred in our study which is consistent with study reported by Masood et al.⁷

The major concern of laparoscopic surgeons is an intraoperative spillage and its serious sequelae like anaphylactic shock or recurrence in future and it is dealt with in many reports by albenadazole treatment preoperatively, decompression of cyst by aspiration and injection of equal amount of scolical agents, pericystic placement of packs soaked with scolical agents, the first puncture at non-dependent upper most point with usage of double suction tubes near the point of aspiration to control spillage and lastly postoperative albendazole therapy.⁷ All these measures were adopted in our work.

Regarding the pain, the mean of VAS score on the first day postoperatively was 5.19 which aligns with the results reported by Masood et al⁷ who report the VAS score on first day is 6.36, reflecting that the severity is moderate in both. The moderate pain severity may be ascribed to the small wound access of laparoscopic technique resulting in reduction of tissue damage or

dissection as elucidated by Patil et al.²⁰ Therefore, post-operative hospital stay was 1-2 days in majority of patients (23 patients, 85.17%) with mean 1.59 days which is comparable to study conducted by Shi in which the hospital stay is 2.1 days.¹⁷ Thus, our patients had a short duration of analgesia requirement postoperatively (mean of 1.15 days). This comes in accords with studies conducted by Shi¹⁷ reporting that the durations and requirements for pain management are generally much decreased in LS intervention.

In our study, post-operative complications were reported in 4 patients (14.81%) which is comparable to results of Minaev et al¹⁸ who notice a complication rate of 14.3%. However, the complication rate is 6.6% in series of Masood et al.⁷ In our study, the following complications were detected: cavity abscess, atelectasis, port site infection and post-operative bile leak which were treated as mentioned in results with no port site hernia. These findings correspond with the research conducted by Masood et al.⁷ Though, a number of researchers have reported recurrence rate of LS is (1.1%)¹⁰, in our series there was no recurrence during period of follow up stated in methodology and that is similar to finding of Masood et al.⁷

CONCLUSION

Laparoscopic liver hydatid surgery can be feasible and safe therapy for LHC in case of proper selection of patients and following meticulous LS accompanied with pre- and postoperative albendazole treatment.

Author's Contribution:

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Drafting or Revising Critically:	Noori Hanoon Jasim, Mushtaq Chaseb Abu-Alhail
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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