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Original Research Article

Comparative study of laparoscopic versus open surgery in 42 cases of liver hydatid cyst

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Abstract

Background: Hydatid disease is endemic mainly in the Mediterranean countries, the Middle East, South America, India, Northern China and other sheep rearing areas. Liver is the commonest site of affection (55-70 %) followed by lung (18-35 %). In the last decade, laparoscopic treatment of hepatic hydatid disease has been increasingly popular and has undergone a revolution parallel to the progress in laparoscopic surgery. This study presented our experience with 42 cases of liver hydatid cyst comparing laparoscopic approach and open approach for surgery during a period of one and a half years at our institute.

Objectives: The main objective of the present study was to study retrospectively, the merits of laparoscopy over that of open surgery in treatment of hydatid cyst of liver.

Material and methods: This study comprised of 42 patients who diagnosed to have liver hydatid cyst treated during the period of January 2013 to June 2014 at our Hospitals. They were treated either by laparoscopic approach or by open method for liver hydatid cyst. Patients not fitting into inclusion criteria were excluded from study. Predefined proforma was filled up and results were analyzed.

Results: Conversion to open surgery occurred in two cases (4.84 %). The mean cyst diameter was 6.62 cm (range, 2–15 cm) in group 1 and 7.23 cm (range, 2–18 cm) in group 2 (p = 0.699). The mean operative time was 90 min (range, 70–110 min) in group 1 and 110 min (range, 90–130 min) in group 2 (p\0.001). The general complication rate and abdominal wound complication rate were respectively 0 % and 0 % in group 1 (p = 0.023) compared with 5.23 and 8.72 % in group 2 (p = 0.015). The mean hospital stay was 6.42 days (range, 1–21 days) in group 1 and 11.7 days (range, 4–80 days) in group 2 (p = 0.001). The mean follow-up period was 24.2 months (range, 6–32 months) in group 1 and 28.4 months (range, 6–40 months) in group 2. No recurrences were observed in either group during this period.

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Conclusions: Laparoscopic surgery provides a safe and efficacious approach for almost all types of hepatic hydatid cysts. Large, prospective, randomized trials are needed to confirm its superiority.

Key words

Liver hydatid cyst, Open surgery, Laparoscopic surgery.

Introduction

Hydatid disease is a severe parasitic disease with a widely ranging distribution. Echinococcosis is considered to be endemic in regions wherein farming is the basic occupation of the population [1]. Hydatid disease must be treated once it is diagnosed. Surgery remains the gold standard therapy [2, 3] despite the increased interest in nonsurgical techniques. Because the open procedures are followed by significant morbidity, especially in terms of wound infection [2, 3] the laparoscopic approach has become increasingly popular, although controversies regarding the role of laparoscopy in the management of hydatid disease have not been resolved to date [2]. This study presents the results of both open and lapa roscopic treatment in Liver hydatid cysts.

Material and methods

This study comprised of 42 patients who diagnosed to have liver hydatid cyst treated during the period of January 2013 to June 2014 at our Hospitals.

Inclusion criteria

- Single superficial cyst likely to rupture
- Large cyst with multiple daughter cysts
- Cysts in communication with the biliary tree
- Infected cysts
- Cysts giving compression to the near vital organs

Exclusion criteria

- Deep intra parenchymal cysts
- Posterior cyst
- More than 3 cysts
- Cysts with thick and calcified walls.
- Cysts characterized by heterogeneous complex mass (Gharbi type 4)
- Cyst less than 3 cm in diameter
- Serious coagulation abnormalities
- Patient unfit for laparoscopic approach
- Presence of extra-hepatic hydatid cyst.

A patient was randomized for laparoscopic or open management of hydatid cyst of liver if hydatid cyst was confirmed at Sonographic or CT examination. Patients were given Albendazole treatment 10 mg/kg/day for 4 days pre-operatively.

Informed consent was obtained from all participating patients. Pre-operative investigations were done. As per inclusion criteria 42 patients were randomly allocated to two groups, for surgical treatment of liver hydatid cyst by either laparoscopic or open approach. Palanivelu hydatid trocar system (PHTS) was used for the laparoscopic approach.
All patients underwent clinical follow-up and daily monitoring until they were discharged from the hospital.

All patients were given intravenous analgesics (Diclofenac sodium) 3 days and switched over to oral analgesics after 3 days, intravenous antibiotics (inj. cefotaxime, inj. amikacin, and inj. metronidazole) for 3 days and switched over to oral antibiotics after that in uneventful post-operative course. Patients were given sips to

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liquids orally from 1st post operative day. The daily drain output, its consistency and color were monitored and drain was removed when the output became <20 ml/day for 3 consecutive days and the drain fluid color was nonbilious. Patient having bile stained fluid in the drain was sent home after making the drain short. Patient was discharged and asked to come for follow up ultrasonography and X ray after 1 month.

Patient outcome, including length of hospital stay, complications related to the procedure, and treatment failure and death were recorded.

Results

All patients of hydatid cyst were assessed for eligibility for participation in the study. Out of these, 42 patients had been randomized into two surgical treatment groups and operated for liver hydatid cysts in between January 2013 to June 2014. None was lost to follow-up or had their treatment discontinued. 21 patients were randomized into each of the open surgical and laparoscopic surgical groups.

Age distribution of patients was as per **Table – 1**. Sex distribution of patients was as per **Table – 2**. Clinical presentation of patients was as per **Table – 3**. Most of the surgical complications [2] in group 2 were wound complications (seromas, suppuration: 8.72 %, 15 cases) and biliary fistulas (4.65 %, 8 cases) as per **Table - 4**. Wound complications (seromas or suppuration of the wound) required removal of two or three cutaneous stitches and collection evacuation followed by daily antiseptic treatment, with a favourable evolution. The pathologic characteristics of the cysts and the surgical procedures used for the treatment of the hepatic hydatid cysts in both surgery study groups were as per **Table - 5**.

Table – 1: Age distribution

Age in years	No. of surgeries	
	Laparoscopic	Open
10-19	2	1
20-29	2	3
30-39	4	5
40-49	6	8
50-59	4	2
60-69	2	1
More than 70	1	1
Total	21	21

Table – 2: Sex distribution

Sex	Laparoscopic	Open
Male	7	8
Female	14	13

Table – 3: Clinical presentation

Presentation	Laparoscopic	Open
Abdominal pain	16	19
Dyspepsia	14	16
Malaise/Fatigue	13	14
Nausea/Vomiting	6	8
H/O jaundice	4	3
Abdominal mass	8	9
Asymptomatic	3	2
H/O fever	2	1

The average size of the liver hydatid cysts was 13 cm (range, 11–15 cm) in group 1 and 12.3 cm (range, 10–15cm) in group 2. Both groups were similar in terms of cyst location, size, and type (character). Conversion to open surgery occurred in two cases (4.84 %). The main reasons for conversion to open surgery were bleeding (1 case) and difficult location of the cyst (inadequate exposure; 1 case). The mean operative time was 90 min (range, 70–110 min) in group 1 and 110 min (range, 90–130 min) in group 2 as per **Table - 6**. The mean hospital

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stay was 6.42 days (range, 1–21 days) in the laparoscopic group (group 1) and 11.7 days (range, 4–80 days) in the open group (group 2) as per **Table – 7**. The mortality rate was 0 % for group 1 and 4.76 % (1 case) for group 2 as per **Table - 8**.

Table – 4: Complications of surgery

Complications	Laparoscopic	Open
Wound infection	-	3
Hemorrhage	1	4
Biliary leak	-	3
Abscess/Sub phrenic abscess	-	2
Upper respiratory tract infections	1	1

Table – 5: Characteristics of cyst

Characteristic	Laparoscopic	Open
Average size	13 cm	12.3 cm
Type		
Univesicular	2	4
Multivesicular	19	17
Site		
Right lobe	13	12
Left lobe	6	6
Both lobe	2	3
Number of cysts		
1	13	12
2	6	6
3	2	3
> 3	excluded	excluded
Cyst-billiary communication	5	3

The mean follow-up period was 24.2 months (range, 6–32 months) for group 1 and 28.4 months (range, 6–40 months) for group 2. No recurrences were observed in either group during this period.

Table - 6: Duration of surgery

Laparoscopic	Open
90 min (70-110)	110 min (90-130)

Table - 7: Duration of stay in hospital

Laparoscopic	Open
6.42 days (1-21 days)	11.7 days (4-80 days)

Table - 8: Mortality rates

Laparoscopic	Open
0%	4.76%

Most of the patients (3 cases) who experienced post operative biliary fistula were treated conservatively. The amount of bile drained through the drain tubes from the remaining cavity decreased dramatically after bowel transit resumption, with complete closure of the biliary fistula in 4–8 days. For the two cases in which the biliary fistula did not close spontaneously, ERCP was performed together with sphincterotomy, with closure of the biliocystic fistula accomplished in 5 days. The remaining case had a slow unfavourable evolution with septic hepatic abscess, which required laparotomy.

Discussion

Although the possibilities for the treatment of hepatic echinococcosis have increased considerably in recent years (including medical treatment, PAIR, or a combination of these two), surgery remains the mainstay for healing of hydatid disease [4].

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Initially, however, laparoscopy was not quickly accepted or widely used in the treatment of hydatid disease due to the concern that the recurrence rate and the risk of intra peritoneal dissemination might be higher with laparoscopy than with the conventional approach [5, 6].

Different authors have attempted to reduce the risks with laparoscopy by postoperative Albendazole therapy, proper isolation of the cyst from the remainder of the peritoneal cavity (using various devices), and the use of wide-angle laparoscopes. In fact, the real risk of spillage is lower than might be expected, and the short-term recurrence rate is higher in open surgery.

Another great advantage of laparoscopic treatment is that the laparoscope can be inserted inside the cystic cavity, allowing its inspection.

A few disadvantages of the laparoscopic approach need to be considered. For example, laparoscopy still is limited in terms of liver resection [5], closure of biliary communications, and achievement of pericystodigestive anastomoses, although in recent years, an increasing number of authors have published promising results.

We did not perform any hepatic resections or pericystodigestive anastomoses via laparoscopy [3, 7], although a recently published review involving a large number of patients (1,294 patients with liver resection, 314 of who were treated via laparoscopy) proved that laparoscopic liver resection is safe and feasible with definite short-term benefits and lower postoperative morbidity. The indications for the laparoscopic approach in the treatment of liver hydatidosis have been and still are in constant change [8].

In patients, fit for laparoscopic surgery and falling in the eligibility criteria for laparoscopic surgery, it is the treatment of choice [9] for the following reasons:

- Less chances of wound infection and residual sub-phrenic abscess as compared to open surgery.
- Less post-op pain and analgesic requirement as compared to open surgery.
- Earlier return of bowel activity as compared to open surgery.
- Decreased duration of hospital stay and earlier return to work as compared to open surgery.
- Decreased duration of operative time as compared to open surgery.
- The cosmetic benefit in laparoscopic surgery is obvious.

The only drawback of laparoscopic treatment is increased chances of intra-operative hemorrhage as compared to open surgery but chances of this complication also go down with experience of the surgeon in laparoscopic surgery. When the advantages of the laparoscopic approach are weighed [9], especially the fast healing and aesthetic results, which actually were the only real criteria for assessing the quality of the interventions, the disadvantages of minimally invasive approach are set aside. They are temporary impediments in perfecting the therapeutic concept of the minimally invasive approach, which surely will be the future of surgery.

Conclusion

Many of the open surgery techniques for hepatic hydatid cysts can be performed laparoscopically, complying with the conventional tempo of the surgical intervention. Laparoscopic surgery [10] provides a safe and efficacious approach to

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almost all types of liver hydatid cysts, but knowledge of the relationship between the cyst and the biliary tract is essential in choosing the appropriate patients. Considering the well-known benefits of minimally invasive surgery, the laparoscopic approach offers a viable alternative to conventional surgery for the treatment of liver hydatid cysts and is worthy to be considered for suitable situations Although the mean operative time was slightly longer with the laparoscopic approach [10] (without statistical significance), we believe that this obstacle can easily be overcome by increased experience of the surgical team. The encouraging results from the current study favour extending the limits of laparoscopy in hydatid disease, motivated primarily by a lower postoperative morbidity, and mortality.

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