International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

A Study of Outcome of Laparoscopic Versus Open Management of Hydatid Cyst

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Abstract: ***Background: Hydatid disease is a parasitic infection and causative agent for it are Echinococcusgranulosus and Echinococcusmultilocularis. Present management of hydatid cyst of the varies from percutaneous drainage to surgical management and medical management. Methods: 60 patients were included in this study who had hydatid disease admitted in SNMC Agra from January 2021 to July 2022. There were two groups and each of them consisted 30 patients. Group A: open surgical management. Group B: laparoscopic surgical management. After surgery total patients followed up for 6 months. Results: The disease affected females (63.33%) in group-A and (60%) in group-B more than males (36.67%) in group-A and 40%) in group-B. The most common age Group involved was between 35-45 years 11 (43.33%) in Group-A and 35-45 years 15 (50%) in group-B. Post operative complications found (16.67%) in group-A and (3.33%) in group-Bsurgical sites Infection was found in (26.67%) group-A while no infection found in group-B. There was no recurrence seen in the operated cases one 1 patient (3.33%) in group-B found post operative recurrence. Maximum patients hospital stay in group A was 9-12days and in group B was 3-6days. Only 1 mortality in the group-A. Conclusions: Overall better outcomes of laparoscopic management of liver hydatid cyst than open surgery of liver Hydatid cyst in form of lesser hospital stay, less post operative complications and surgical sites infections early mobilization, with cosmetic benefit.***

Keywords: Hydatid Cyst, Laparoscopic procedure, open surgery, Echinococcus

1. Introduction

Echinococcosis is zoonotic disease require more than one vertebrate hosts for the completion of agent's development cycle and the causative agent is the larval stages (metacestode) of cestodes which belongs to the genus Echinococcus. Animals are both intermediate and definitive hosts while humans are the intermediate host (dead end). [13]Human Hydatosis is caused by two main types of taperworms: cystic echinococcosis (CE) caused by Echinococcusgranulosus eggs and alveolar echinococcosis (AE) caused by Echinococcusmultilocularis eggs. Echinococcusgranulosus is the parasite which causes Hepatic Hyadatosis, cestode is the form of parasite which lives in the small intestine of dogs and other canines. Eggs are excreted in the feces and when they are ingested by intermediate host, larval form of parasite is released from the eggs in the duodenum. The intermediate host can be sheep/ goat. Humans are accidental intermediate hosts. The intestinal wall is crossed by the larvae which reach in the hepatic sinusoids where they develop into cysts. In some cases liver is not able to filter some of the larva, which remains in blood and eventually reaches the lungs. Some may also pass through the pulmonary circulation and reaches to other stes. Larva transported in the mesenteric lymphatics is carried to the cisterna chili, the thoracic duct, and into the general circulation, ending up in a variety of distant sites. [5, 4]

There are variety of treatments for hydatid cysts in clinical practice, like percutaneous aspiration-injection-respiration (PAIR), medical management like benzimidazole treatment, and surgical treatment [15, 12]. However for large, active, symptomatic, or complicated hepatic hydatid cysts, surgery remains the only definitive treatment (HHC) [12]. The most commonly affected organ is the liver however It may involve multiple organs. In spite of various treatment modalities, surgery is currently considered to be as standard treatment [10] which can be done by radical surgery (hepatectomy or pericystectomy) or conservative (cystectomy, deroofing, omentoplasty, among others). Long-term risk of recurrence has been shown to be the lowest by Radical Surgery [10].

2. Material and Methods

A prospective study was done among the patients of Hydatid cyst admitted through outpatient department and Emergency department from January 2021 to July 2022 in the depart of general surgery at S. N. Medical college, Agra. The sample size of 60 Patients were prospectively randomized in to two groups-

Group-A: It includes 30 patients in whom open surgery was performed.

Group-B: It includes 30 patients in whom laparoscopic surgery was performed.

Inclusion Criteria:

- Patients suggestive of clinical presentation of hydatid cyst and USG findings suggestive of hydatid cyst in all cases.
- No features suggestive of rupture/impeding rupture of hydatid cyst.
- Large cyst with multiple daughter cysts
- Cyst giving compression to near vital organs.
- Cyst in communication with biliary tree

Exclusion Criteria:

- Ruptured/ impending rupture of hydatid cyst
- Deep intra parenchymal cysts and occupying more than 50% of Liver area.
- Posterior cysts
- Patients with bleeding disorder
- Patients requiring abdominal surgery for coexisting conditions.

To determine the outcome of laparoscopic management versus open management of Hydatid cyst of liver in following parameters:

- Post-operative Complications.
- Surgical sites infections.
- Hospital stay.
- Post-operative recurrence.
- Mortality Rate.

Open surgery

In this procedure general anesthesia was given to all the patients. Prophylactic antibiotics was given while adrenaline and steroid should be ready. A midline incision was taken in Group A.

Every cyst was considered as infectious and packing was done with Mop soaked in 5% cetrimide solution or 15% to 20% saline. Decompression of the hydatid cyst was done by carefully puncture of the cyst. A wide bore suction tip was used for aspiration of the cyst and the cyst was incised by using electrocautery after taking of stay sutures and extraction of laminated membrane of cyst was done. Searching for bile duct communication was done after cyst cavity sterilization. [1] Cyst cavity sterilization was done by cleansing mechanically and application of scolicidal agent locally. The cyst cavity was searched for any bile leakage, and loosely packing was done with white and dry packs soaked in cetrimide and if there were any bile stains on the mop, was indicative of cystobiliary communication, and10 minutes were the exposure time for the scolicidal agents such as 20% saline, 96% alcohol, 10% povidine iodine, 10% formalin, 5% chlorhexidinegluconate. Residual cystic cavity and cystobiliary communications were managed in the form of suturing with interrupted 3-0 vicryl/PDS. [1, 3] If there are shallow, large cavities which cannot be obliterated may be covered with the omental flap suturing to the rim or left open. The sterilized cyst cavity was closed with running absorbable sutures in the form of approximation of the both the edges of cavity. Omentoplasty was done in the form of suturing of viable mental flap after placing in to residual cyst cavity with absorbable suture. [2]

Laparoscopic procedure

In this procedure general anesthesia was given to all the patients. Prophylactic antibiotics were given while adrenaline and steroid should be ready. A supraumbilical incision taken of 10 mm and under direct vision, incision deepened and peritoneum opened. Pneumoperitoneum was created by CO2 insufflation through10 mm port. Telescope was inserted. Cyst position was confirmed. In epigastric region another 10mm sharp trocar introduced. Gauze pieces soaked in Hypertonic saline were kept around cyst cavity for isolation. Depending upon the position of cyst, another one or two 5 mm working ports were made. Trans-abdominal insertion of Palaniveluhydatidtrocar system done under direct vision over the cyst. Suction was applied through the side channel to maintain the contact between the cyst and the cannula opening. The trocar with 5 mm suction nozzle inside connected to another suction machine was introduced into the cannula and by steady pressure, was pushed into the cyst along with the cannula. Immediate suctioned of any fluid spillage on puncture of the cyst wall was done. Continuous suction was maintained all the time while The cavity was irrigated through the main channel. Laminated membrane, daughter cysts and debris were removed by suction and irrigation. Cyst evacuation done. Cavity of cyst was examined through telescope for any remaining daughter cyst, hydatidsand, other debris and any cysto-biliary communication. Irrigation of cavity was done byscolicidal agent and hypertonic saline and contents reaspirated after 10 minutes. Procedure continued till returning fluid was clear of debris. Cysto-Biliary communication of more than 5 mm was sutured with vicryl and after that omental packing in the cavity was done. In case of cystobiliary communication which was less than 5 mm, only omental packing was done and drain kept in situ. Drain fixed to abdominal wall. Gauze pieces used for isolation were removed. Ports removed under vision.10 mm port site are closed with vicryl 2-0. Skin is closed with nylon 3-0. Cleaning and dressing of port sites done.

3. Result

From this prospective study conducted by selection of 60 cases with Abdominal Hydatid disease treated at S. N. Medical College, Agra from the period January 2021 to July 2022, the following results are observed:

Table 1: Age Distribution

Age in year	Group A (open management)		Group B (laparascopic management)	
	No.	%	No.	%
15-25	2	6.67	3	10.00
25-35	10	33.33	11	36.67
.35-45	13	43.33	15	50.00
R: 45+	5	16.67	1	3.33
Total	30	100.00	30	100.00
Mean± S. D.	35.90±10.05		33.90±8.72	
T	0.823			
P	>0.05			

The most common age Group involved was between 35-45 years13 (40.33%) in Group-A and 35-45 years 15 (50%) in group-B.

Table 2: Gender Distribution

Sex	Group A (open management)		Group B (laparascopic management)	
	No.	%	No.	%
Male	11	36.67	12	40.00
Female	19	63.33	18	60.00
Total	30	100.00	30	100.00
x^2	0.070			
P	>0.05			

The disease affected females (63.33%) in group-A and (60%) in group-B more than males (36.67%) in group-A and 40%) in group-B.

Table 3: Post Operative Complications

Post operative Complication	Group A (open management)		Group B (laparascopic management)	
	No.	%	No.	%
None	25	83.33	29	96.67
Yes	5	16.67	1	3.33
Total	30	100.00	30	100.00
x^2	2.963			
P	>0.05			

Post operative complication found (16.67%) in group-A and (3.33%) in group-B

Table 4: Surgical Site infections

Surgical Site infection	Group A (open management)		Group B (laparascopic management)	
	No.	%	No.	%
None	22	73.33	30	100.00
Yes	8	26.67	-	0.00
Total	30	100.00	30	100.00
x2	9.231			
P	<0.05			

Surgical sites infection was found in (26.67%) group-A while no infection found in group-B.

Table 5: Hospital Stay

Hospital stay	Group A (open management)		Group B (laparascopic management)	
	No.	%	No.	%
3–6	0	0.00	27	90.00
6–9	2	6.67	2	6.67
9–12	11	36.67	1	3.33
12–15	10	33.33	-	-
15–18	7	23.33	-	-
Total	30	100.00	30	100.00
Mean±sd	12.00±2.71		4.33±1.40	
t	13.773			
p	<0.05			

Maximum patients hospital stay in group-A was 9-12 days while in group-B was 3-6 days.

Table 6: Post-Operative Recurrence

Post Operative Recurrence	Group A (open management)		Group B (laparascopic management)	
	No.	%	No.	%
None	29	96.67	30	100.00
Yes	1	3.33	0	0.00
Total	30	100.00	30	100.00
x2	1.017			
p	>0.05			

Post operative complication found (16.67%) in group-A and (3.33%) in group-B

Table 7: Mortality Rate

M. R.	Group A (open management)		Group B (laparascopic management)	
	No.	%	No.	%
None	29	96.67	30	100.00
Yes	1	3.33	0	0.00
Total	30	100.00	30	100.00
x2	0.050			
P	>0.05			

Only 1 mortality in the group-A.

4. Discussion

The principles of laparoscopic management of Hydatid cyst is mostly the same as in open surgery only using a minimal access approach. [14]In our study the demographic parameters like age, gender were not statistically significant in both the groups. The mean age was 35.90 in Group-A and 33.90 in Group-B group respectively.

Same type of result seen in Zaharie's et al [8] study where mean age is 45.7 years in Group A and 43.8 years in Group B. In our study post operative complications found in Group-A out of 30 patients 5 patients (16.67%) have post operative complications, While in Group-B out of 30 patients only one patients (3.33%) have post operative Complication. Similarly, Vikram et al (2020) [7] found external biliary fistula is the most common complication, seen in 12% of cases in group A, while it is 4% in Group B. The majority of patients were treated conservatively and there was no requirement of surgical interventions and amount of bile drain decreases after the bowel transits resumption with complete closure of biliary fistula in 4-8 days. There were follow up for 6 months after surgery. No patients with recurrence of hydatid cyst seen in any group of patients in this study. [16]

Our study shows that in Group-A out of 30 patients, 8 patients (26.67%) have surgical site infections. While in Group B out of 30 patients, there was no surgical site infections found in any patients.

In our study in Group A, out of 30 patients, 21 (maximum no of patients) patients have hospital stay 9-15 days (70.00%), while in Group-B out of 30 patients max No of patients & (90%) have hospital stay 3-6 days. The data is comparable to the study conducted by Zaharie's and Ciprian et al study. [8] Group B had less burden in term of time of patient and hospital stay. [11, 14]

In our study post operative Recurrence, in Group-A there was only one Recurrence (3.33%) while in Group-B, there was no Recurrence. While, according to previous articles, some studies conclude that laparoscopy could reduce the recurrence rate of hepatic hydatid cyst. [7]

In our study mortality rate in while in Group-A there was one mortality (3.33%) while in Group-B there was no mortality found. While results of other study explain the role of laparoscopic surgery in management of hydatid cyst with less morbidity and mortality, but it still requires more number of study [16].

More detailed information on the comparison between laparoscopic and open surgery is still missing. At present, conventional surgery is still the most widely used in endemic and non-endemic areas when compared to laparoscopy. However, Laparoscopy is getting more advantages over conventional surgery in form of less pain, good cosmetic results, less hospital stay, less, and less postoperative adhesion [4].

5. Conclusion

The present study conclude that patient of hydatid cyst treated by laparoscopy had less postoperative complications, less surgical sites infections, early resumption of routine work or less hospital stay and no any post operative mortality and recurrence as compared to open management of Hydatidcyst. For laparoscopic treatment we should have preoperatively exact diagnosis and location of Hydatid cyst. However result of our study shows that laparoscopic management have better outcome than open management of Hydatid cyst. An exaggerated fear of anaphylaxis seemed to discourage surgeons from more widely adopting minimal access techniques for the treatment of hydatid cysts. [6]Because there are no prospective randomized controlled trial in the literature comparing Laparoscopic surgery and open surgery treatment procedures for liver hydatid cyst [9], we suggest future research to perform RCTs to address the aims.

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