

## Role of laparoscopy in Hydatid cyst disease

Viral G. Sangani\*, Dimple A. Mehta\*\*, Priyanka Garg\*\*\*, Kishor Jain\*\*\*\*

### Abstract

Management of hydatid cyst disease is basically of excision of cyst wall and removal of all daughter cysts which was previously done by open technique. With proper selection of patient our strategy was going for laparoscopic approach first with conversion to open approach in accordance with difficulties encountered. **Aim :** To study the role of Laparoscopy in Hydatid Cyst Disease. **Method :** In this study, we present 30 cases where all cases were planned for initial laparoscopic trial and conversion to open if difficulties were encountered. This is an observational study to evaluate the role of laparoscopy in hydatidosis. All the patients underwent thorough clinical examination with detailed history and investigation as per protocol. Written informed consent was obtained before enrolling for the study. All patients were followed for 3 months. **Result :** Conversion to open surgery was done in 40% of cases due to number of cysts more than 3 and GHARBI type IV cysts followed by biliary communication of cysts and then peritoneal cysts and unfavourable location of cysts. Rest 60% patients were managed laparoscopically with good postoperative outcome and shorter hospital stay. **Conclusion :** laparoscopic treatment of hydatid cyst disease is a safe and effective procedure; with an excellent learning curve; provided strict selection criteria are observed. Most common reason for conversion to open approach was cyst number more than 3 and GHARBI type IV cysts, which were not diagnosed preoperatively. Complication rate was less with laparoscopic approach as compared to patients undergoing open surgery. Postoperative recovery was excellent in patients operated laparoscopically with shorter hospital stay.

**Key Words :** Hydatid Cyst Disease, Laparoscopy

### Introduction :

Hydatid disease (cystic echinococcosis) is a zoonotic infection caused by larval form of tapeworm *Echinococcus Granulosus*. *Echinococcus* infestation has been known for many centuries. Hippocrates and Galon (460-377 B.C.) were clinically aware of 'liver full of water'.<sup>(1)</sup> Most common sites for cysts are liver and lung hydatidosis. They have a diverse clinical spectrum from being asymptomatic to symptoms arising due to involvement of surrounding structures or dissemination or secondary infection. In general hepatic hydatid cysts are single (80%) uncomplicated and located in right lobe of liver (80%).<sup>(2)</sup> Asymptomatic cysts may persist for years without producing any symptoms.<sup>(3)</sup> Surgery is the mainstay of treatment in hepatic hydatid disease.<sup>(3)</sup> Classically, open methods are best modality for managing complicated and unfavourable hydatid disease. Laparoscopy has emerged in big way in management of abdominal pathologies due to low morbidity associated with the procedure. Laparoscopy is safe, effective method in carefully selected subset of patients. Its application in hepatic hydatid diseases has been reported by few.<sup>(4)</sup> This study aims to evaluate the role of laparoscopy in such conditions to improve perioperative outcome in terms of intra-operative complications, post operative pain and short duration of hospital stay and similar infection free state when compared to open procedure. The only concern with

laparoscopy lies in the learning curve associated with the procedure and paucity of cases which make its widespread application limited.

### Aim

The aims and objective of current study were: (1) to find out difficulties encountered during laparoscopy. (2) Search out for Intra-operative complications of laparoscopy in hydatid cyst disease and (3) to reveal post-operative outcome and morbidity and conversion rate to open surgery.

### Methodology :

The study was undertaken after necessary ethical permission from appropriate authorities. This was an observational study of duration from August 2010 to September 2013 done in one of the Government hospital attached with medical college of Gujarat. Total no. cases included in study were 30. All the patients underwent thorough clinical examination with detailed history and investigation as per protocol. Written informed consent was obtained before enrolling for the study. All patients were followed for 3 months. Following were the selection criteria for study participants.

### Inclusion Criteria :

- Documented hydatid disease
- Cyst size greater than >3 cm
- Patient fit for general anaesthesia

### Exclusion Criteria :

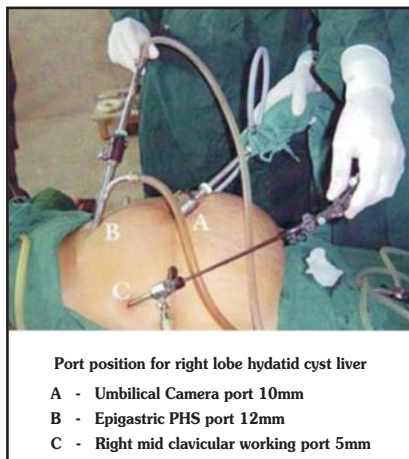
- Previous abdominal surgery
- Recurrent disease
- Multiorgan involvement
- Not fit for general anaesthesia
- Not fit for laparoscopic surgery
- Allergic to albendazole

\* Assistant Professor,  
\*\*\* Resident  
\*\*\*\* Senior Resident  
Department of General surgery, M.P. Shah Medical College,  
Jamnagar, Gujarat  
\*\* Assistant Professor  
Department of Pathology, M.P. Shah Medical College, Jamnagar,  
Gujarat  
Correspondence : dr.viralsangani@gmail.com

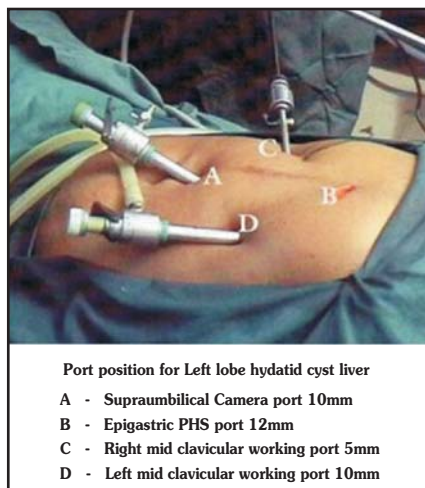
**Procedure :**

Under general anaesthesia and supine position. Pneumoperitoneum was created with pressure of 12 mm Hg and flow rate of 5L/min. Laparoscope was introduced at 30 degree and diagnostic laparoscopy was done noting down the location, size and number of cysts. A 10 mm trocar was introduced as close possible to the cyst. Another 5 mm trocar was introduced in subxiphoid region for additional suction and retraction purpose. (Photograph 1 & 2)<sup>(5)</sup>

**Photograph 1 : Port Position for Right lobe hydatid cyst liver**



**Photograph 2: Port Position for Left lobe hydatid cyst liver**



If required, patients were put into trendelenberg position. 14 G aspiration needle was introduced through 10 mm port and cyst cavity was punctured and aspirated while maintaining suction besides through 5 mm port. Additional suction took care of any accidental spillage while entering the cyst. After decompression of cyst, cyst fluid was replaced with equal amount of hypertonic saline and was left for 10 minutes. Again the contents were aspirated and this process repeated until the aspirate was clear and cavity was entered. Then, Laparoscope was introduced inside the cyst to look for any daughter cyst or residual germinal membrane. Cyst was fully

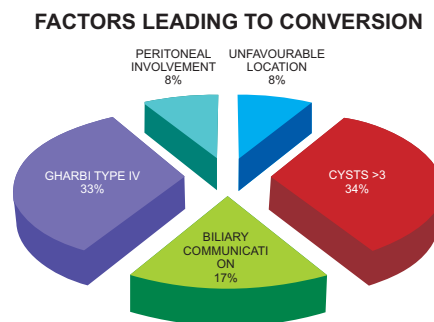
cleared and suctioned out. Deroofting of cavity was done. Any biliary communication was checked for and drainage tube was kept inside the cyst cavity.

If difficulty was encountered, laparoscopically procedure was converted to open. Right subcostal muscle cutting incision was made and abdomen entered. Betadine soaked pads were placed to prevent the viscera from any accidental spillage and resulting secondary hydatids. Cyst was aspirated and replaced with hypertonic saline and reaspirated until clear. Cyst was opened and contents aspirated. Cyst was removed and drain kept in the cavity. Abdomen closed in layers.<sup>(6)</sup>

**Factors leading to conversion**

Most common cause for conversion from laparoscopic to open was multiple cysts (4 cases) and GHARBI type IV<sup>(7)</sup> cysts (4 cases). Other causes were biliary communication between cysts, unfavourable location of the cyst or peritoneal involvement. (Photograph 3)

**Photograph 3 : Factors leading to Conversion from laparoscopy to open surgery**



**Post Operative Outcome**

Laparoscopic approach is definitely associated with better immediate post operative outcome. There was no incidence of wound infection in laparoscopic cases as compared to 4 cases in open approach. 1 case of Biliary Fistula was seen in Laparoscopy while 2 in open approach as suggested in table 1. Chi-square test was applied for statistical analysis and was found that incidence of wound infection was statistically significantly higher (p=0.0373) in open surgery as compared to Laparoscopic approach. Incidence of biliary fistula was also higher in open surgery than laparoscopically but was not statistically significant. (p=0.7094)

**Table 1: Comparison of Incidence of complications between Laparoscopy & Open surgery (n=30)**

Type of surgical approach	Wound infection	Biliary fistula
Laparoscopy	0	1
Open surgery	4	2

Table 2 suggests Mean duration of hospital stay was significantly shorter in patients who underwent laparoscopic removal of cyst. Student's t-test was applied for statistical comparison between mean duration of hospital stay between

two varieties of approach. Mean duration of stay in hospital in laparoscopic cases was 4 days, whereas, in patients who underwent open cyst excision duration of stay was 11 days. Though table 2 suggests mean duration of hospital stay was very less in laparoscopic approach as compared to open surgical approach, same was not found statistically significant. ( $p=0.7470$ )

**Table 2 : Comparison of post-operative stay between laparoscopy and open surgery**

Post-operative stay (in days)	Laparoscopic (n=18)	Open (n=12)
0-4	15	0
5-8	3	4
9-12	0	6
13-16	0	1
17-20	0	0
21-24	0	1

### Discussion

Hydatid disease is common in saurashtra region due to cattle rearing and farming as occupation. It is commonly seen in lower socioeconomic strata due to poor hygiene and sanitation. Abdominal pain is most commonly presenting symptom seen in all of the cases, followed by symptoms of fever and jaundice.

In our study ultrasonography and CT scan were 92% specific. In present series 30 patients had 58 cysts imaged preoperatively. They were classified according to Gharbi classification. Most common cysts are type I and type II followed by type III. Our study shows right lobe and left lobe involvement as 67% and 13% cases respectively and both lobe involvement in 20% cases. Mergen H et al<sup>(8)</sup> in their study reveals that, right lobe involvement was seen in 65% of cases, left lobe in 13% and both lobes in 8%. Maingot<sup>(6)</sup> has also observed more involvement of right lobe (80%) as compared to left lobe (20%).

In present study single cyst was found in 40% cases and multiple cysts were found in 60% cases. Mergen H et al<sup>(8)</sup> in their study found 69% of cases were affected by single cyst and multiple cysts were seen in 31% of cases. In present series 8% of cases had peritoneal involvement other than liver. Peritoneal involvement was found in 1 case intra operatively. Such cases were treated by open approach.

Medical treatment in form of albendazole was given to all 30 patients preoperatively. Tekin A et al<sup>(9)</sup> study consider that regardless of the surgical treatment used in liver hydatid cyst cases, combination with chemotherapy is the safest and most effective approach. Our approach in this study was laparoscopic removal of cyst or conversion to open approach in accordance with difficulties encountered intra-operatively. Also 4 patients were found to have cyst no more than 3 and in 4 patients, cyst was having thick calcified walls which made us to shift to open approach. Four patients had complex heterogeneous cyst (GHARBI type IV), we went for a radical approach namely pericystectomy in this patient.

In the present series there was no intra operative

complication encountered. No incidence of anaphylaxis due to spillage or injury to biliary system or any vessels. Conversion to open surgery was done in 40% of cases due to number of cysts more than 3 and GHARBI type IV CYSTS followed by biliary communication of cysts and then peritoneal cysts and unfavourable location of cysts.

Comparing the complication rate of two techniques, comparison would be definitely in favour of laparoscopic approach; due to strict patient selection criteria. Mean duration of hospital stay was significantly shorter in patients who underwent laparoscopic removal of cyst. This can be attributed to early ambulation and less degree of post operative pain associated with laparoscopy.

In our study, 3 cases of biliary fistula had occurred-1 after laparoscopic removal and 2 after open approach; but they all resolved after 11 days of post-operative drainage. No intervention was done in such cases. No patient had wound infection after laparoscopic removal of cyst whereas 4 patients who underwent open approach had wound infection. Among 30 patients, 21 patients had routine follow up to 3 months; others were lost to follow up. There was no complaint or recurrence during this follow-up. All patients completed their chemotherapy.

### Conclusion

A strong suspicion of hydrated cyst is warranted for upper abdominal symptoms especially in endemic areas. Ultrasonography and CT scan will always clinch the diagnosis. If required, additional imaging can be ordered if there is suspicion of rupture or communication so that adequate pre operative planning can be done.

Laparoscopic hydatid cyst surgery is safe and effective method in selected patients. It is associated with shorter hospital stay, no wound infection and low postoperative morbidity. It eliminates the disadvantages associated with a surgical incision.

There should be low threshold for conversion to open to prevent accidental spillage and associated anaphylaxis or secondary hydatid formation. No recurrences were observed during the follow up period of 3 months.

### References

1. Kirby I Bland , Mark P Callery, G. Patrick Clagett , Daniel B Jones, Josef E. Fischer, Mastery of surgery 5<sup>th</sup> Edition-**Publisher:** Lippincott Williams & Wilkins. Chapter No.93 Page no.2476
2. [http://www.who.int/zoonoses/neglected\\_zoonotic\\_diseases](http://www.who.int/zoonoses/neglected_zoonotic_diseases), last accessed on June 13, 2014
3. (Editor), Christopher Bulstrode (Editor), P Ronan O'Connell (Editor). Bailey & Love's short practice of surgery 24<sup>th</sup> edition. **Publisher:** Hodder Arnold. Chapter No.63, page no.1077
4. [http://www.laparoscopyhospital.com/Laparoscopic\\_versus\\_open\\_management\\_of\\_liver\\_hydatid\\_cyst.htm](http://www.laparoscopyhospital.com/Laparoscopic_versus_open_management_of_liver_hydatid_cyst.htm) [(last accessed on June 13, 2014)]
5. C. Palanivelu, Art of laparoscopic surgery, vol. 2,1<sup>st</sup> Edition, Publisher: Jaypee Brothers Publishers, pp. 757-785
6. Michael Zinner & Stanley Ashley, Maingot's abdominal operation 11<sup>th</sup> edition, chapter 51. Publisher: McGraw-Hill Professional Publishing, pp. 1534-1544
7. Gharbi HA, Hassine W, Brauner MW, Dupuch K. Ultrasound examination of the hydatid liver. Radiology. 1981 May; 139(2):459-63
8. Mergen H, Genç H, Tavusbay C. Trop Doct. 2007 Jan; 37(1):54-6
9. Tekin A, Küçükkartallar T, Kartal A, Kaynak A, Ozer S, Tavli S, Belviranlı M, Sahin M, Yol S, Aksoy F, Tekin S, Vatanser C, Erikoglu MJ Gastrointestin Liver Dis. 2008 Mar; 17(1):33-7