

Research Article

Management of hepatic hydatidosis by laparoscopic approach in rural central India: a 3 year experience

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ABSTRACT

Background: Hydatid disease is still a major health problem in the infested areas of world, mainly in sheep-raising areas. But owing to increased travel and tourism all over the world, it can be found anywhere, even in developed countries.¹ Thus, surgeons in nonendemic areas encounter the disease and should be aware of its optimum treatment. A safe, new method of laparoscopic management of hepatic hydatidosis is described along with the review of relevant literature.

Methods: From April 2011 to October 2013, Fifteen cases of hepatic hydatid disease were operated on laparoscopically using the Palanivelu hydatid system.

Results: The majority of the patients presented in the 4th decade (43.3%) with female sex predisposition (70% females). Most common presenting feature was pain in the upper abdomen. Most of the patients had only a single cyst (76.6%). The right lobe of the liver was most commonly involved. Cysts were bilateral in 6 patients. In all the patients simple evacuation of the hydatid cyst by the palanivelu hydatid system was done. The remnant cavity was dealt with by omentoplasty. The average follow-up period is 6 months. There have been no recurrences to date.

Conclusions: Minimal invasive management, using Palanivelu hydatid system for aspiration and laparoscopic intervention, is an alternative to open surgery because of its ability to prevent spillage and thus minimize recurrences.

Keywords: Hepatic hydatidosis, Laparoscopy

INTRODUCTION

With the passage of time, the treatment for hydatid liver cysts has been undergoing revolutionary changes. The era of open surgery with its associated large incision and prolonged stay is now being challenged by lesser invasive procedures.² In the last decade, laparoscopic treatment of hepatic hydatid disease has been increasingly popular and has undergone a revaluation parallel to the progress in laparoscopic surgery.³

Hepatic Hydatidosis is caused by the parasite, *Echinococcus granulosus*, which is a cestode that lives in the small intestine of dogs and other canines. Eggs are eliminated in the feces and when ingested, liberate their

larvae in the duodenum of an intermediate host. The intermediate host can be sheep/goat. Humans are accidental intermediate hosts. The larvae cross the intestinal wall and via the portal system reach the hepatic sinusoids where they develop into cysts. Some larvae are not filtered in the liver, but remain in the blood to reach the next station, the lungs. In addition, some may pass through the pulmonary circulation and travel to other organs. Larva transported in the mesenteric lymphatics are carried to the cisterna chylifera, the thoracic duct, and into the general circulation, ending up in a variety of distant sites.^{4,5}

The most common site of occurrence of hydatid cysts in humans is the liver (50% to 93%).^{4,6,7} Left untreated, the

cyst grows and follows one of several courses: forms fistulas into adjacent organs or the biliary system, ruptures into the peritoneal cavity causing seeding of multiple daughter cysts throughout the peritoneal cavity, developing daughter cysts within or rarely dying *de novo*. Older cysts have an increased risk of exogenous daughter cyst formation, which is an important factor for recurrence of disease after surgery.^{8,9}

Despite advances in medical treatment and in interventional radiology, the surgical approach remains the gold standard.^{10,11} Only medical treatment, without surgery of liver echinococcosis with albendazole or mebendazole remains controversial.¹² Laparoscopy, as minimally invasive surgery, has well known clinical advantages over traditional surgery. Several reports have confirmed the benefit of a laparoscopic approach to liver hydatid disease.¹³⁻¹⁵

METHODS

In all patients, the diagnosis of echinococcal cyst was based on history, physical examination, ultrasound (US), and computed tomography (CT) scan. Ultrasound was used for follow-up. All patients were treated with albendazole 10 mg/kg/day for at least 2 weeks preoperatively and continued postoperatively for 4 weeks. The exclusion criteria were no informed consent; patients unfit for general anaesthesia; deep-seated cysts; posteriorly located cysts (segments I, VII and VIII); cysts less than 3cm in diameter and pregnancy.

Technique

After introducing the camera port through the umbilicus following creation of pneumoperitoneum, the hydatid cyst is identified on the surface of the liver. Then, the PHS trocar with cannula is introduced into the peritoneal cavity directly over the hydatid cyst. Once inside the peritoneal cavity, the trocar is removed and the cannula alone is advanced till its tip is in total contact with the hydatid cyst surface. Suction is applied through the side channel to maintain the contact between the cyst and the cannula opening. Thereafter, the trocar with a 5-mm suction nozzle inside connected to another suction machine is introduced into the cannula and, by steady pressure, is pushed into the cyst along with the cannula. Any fluid spillage on puncture of the cyst wall is immediately suctioned either into the body of the hollow trocar through its fenestrated tip and then into the suction cannula or into the outer cannula and thence, into the suction side-channel. Once the PHS enters into the hydatid cyst, the trocar is removed and the cavity is irrigated through the main channel while continuous suction is simultaneously maintained all the time. In this way, fragments of laminated membrane, daughter cysts, and debris are easily removed. Once the retaining fluid is clear, CO₂ is insufflated at low pressure (3 mmHg to 4 mm Hg), and the telescope is introduced into the cavity through the cannula to visualize the interior for any cyst-

biliary communication. In the absence of overt cyst-biliary communication (verified by the absence of bile staining in the suctioned fluid and non-visualization of the opening within the cyst cavity), 0.5% cetrimide is instilled into the cyst cavity as a scolicedal agent. After 10 minutes, the scolicedal agent is suctioned and the cyst is marsupialized. In case of cyst-biliary communication is visualized the opening is sutured closed with 3-0 Vicryl. Omentoplasty is done for all cases. The drainage tube is kept near the cyst.

Postoperatively, the residual cavity is monitored by US at 1 month and 6 months. If clinically indicated, US is repeated at shorter intervals. The primary end points were defined as complete collapse of residual cavity as seen on US at the end of the procedure, disappearance of residual cavity or at least 50% reduction in size at follow-up imaging. The secondary end points of the study were recurrence of cyst and any morbidity within 6 months after or loss to follow-up.



Figure 1: Palanivelu hydatid trocar system - Cannula and reducer.

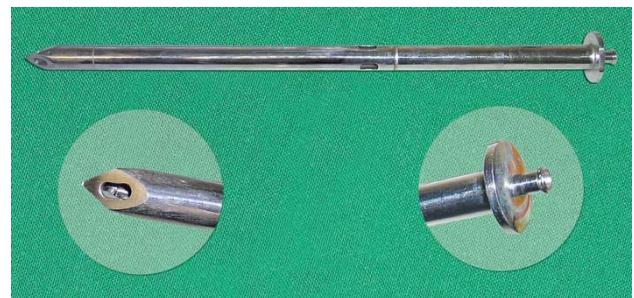


Figure 2: Palanivelu hydatid trocar system - Trocar.

RESULTS

Since 2011, 15 patients have been operated on by using PHS. The distribution of the patients regarding age and sex is summarized in Table 1. The majority of patients (86.6%) presented with pain in the upper abdomen. The mode of presentation of the patients is listed in Table 2. Most of the patients (n_12, 80%) had only a single cyst, while 3 patients (20%) had 2 cysts. The right lobe of the liver was involved (n_8, 53.3%) followed by left lobe (n_5, 33.3%) while cysts were bilateral in 2 cases (13.3%).

Postoperatively, Only 1 patient (3.3%) had biliary fistula in which bile drainage ceased after 7 days. No other patient experienced any complications.

Of the 15 patients, regular follow-up has been maintained in 13 patients with an average follow-up period of 25 months. There have been no recurrences till date.

Table 1: Age and sex of 15 patients operated on with the Palanivelu hydatid system.

Youngest patient	13 years
Oldest Patient	70 years
Mean Age	43.53 years
Males	5 (33.3%)
Females	10 (66.6%)

Table 2: Symptoms of hepatic hydatid disease.

Pain in abdomen	13 (86.6%)
Abdominal Lump	4 (26.6%)
Fever and Chills	1 (6.6%)
Nausea and Vomiting	1 (6.6%)

Table 3: Clinicopathology.

Single cyst	12 (80%)
Multiple Cysts	3 (20%)
Site-Right Lobe of Liver	8 (53.3%)
Site-Left Lobe of Liver	5(33.3%)
Site-Both Lobes	2 (13.3%)

DISCUSSION

The common mode of *E. granulosus* infection is the unhygienic practice of consuming unwashed or improperly washed infected raw fruits and vegetables, direct contact with infected dogs is also another means of contracting the disease, especially in children.¹⁶

The youngest patient in the study was 13 years old though the average age of 43.5 years was in keeping with the average age of presentation in endemic areas.¹⁷ However in nonendemic areas, all the age groups are usually equally affected with the average

age of presentation being older.^{17,18} Females were predominantly affected in the study other published

studies have also reported female preponderance.^{18,19} Abdominal pain was the most common mode of presentation (86.6% of cases) in this study, which has also been reported by other authors.^{18,19}

The most common pathology was a single cyst in the right lobe of the liver. Similar findings have also been reported by other authors.^{17,18} Ultrasonography and CT are both effective imaging modalities for the detection of liver hydatid disease. US is particularly useful for the detection of fragments of endocyst membranes, septa, and hydatid sand, while CT best demonstrates cyst wall calcification and cyst infection.²⁰

Surgery remains the mainstay of treatment for hepatic echinococcosis.^{10,11} Several nonsurgical options have been explored. The first report of laparoscopic treatment of hydatid cyst of the liver was published in 1994²¹ followed soon thereafter by the first report of anaphylactic shock complicating laparoscopic treatment of hydatid cysts of the liver.²² In fact, an exaggerated fear of anaphylaxis seemed to discourage surgeons from more widely adopting minimal access techniques for the treatment of hydatid cysts.²³ However, gradually reports started appearing in the world literature detailing laparoscopic management of liver hydatid disease.²⁴ The indications, contraindications, advantages, and disadvantages of this technique have been elucidated.²⁵

In our study, we have performed procedure laparoscopically, the remnant cyst was dealt with by omentoplasty. We have used the Palanivelu Hydatid System (PHS), a specially designed trocar to obtain a totally contamination-free management of liver hydatid disease. One of the problems faced in laparoscopic treatment of liver hydatid cysts was the difficulty in evacuating the particulate contents of the cyst, the daughter cysts, and laminated membrane. However the specially designed PHS has overcome these difficulties and allows intracystic magnified visualization for cyst-biliary communication.

CONCLUSION

We recommend PHS for management of hepatic hydatid disease. We have found its efficacy to be optimum for preventing spillage, evacuating contents of hydatid cysts and visualization of cyst-biliary communication. The only limitation of this system is related to the anatomical location of the cyst. At present, we do not recommend this technique for posteriorly located cysts, small cysts, and cysts deep within the hepatic parenchyma.

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Ethical approval: The study was approved by the institutional ethics committee

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