

Case Report

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Laparoscopic Management of Hydatid Cyst: A Series of 10 Cases

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ABSTRACT

Background: Hydatid disease is an endemic parasitic disease in Mediterranean countries, the Middle East, Far East, South America, Australia, New Zealand, and East Africa. It is a zoonotic infection caused by *Echinococcus granulosus*, spread by carnivores (pets) with man acting as an accidental intermediate host. Hydatid cyst commonly affects liver followed by lung but rarely affects both organs. Here, we report a series of ten cases of Hydatid cyst, documented on ultrasonography with or without symptoms. Organs affected were liver, lungs, spleen and a rare presentation of inguinal cyst has also been reported.

Aim and objectives: In the era of minimal invasive surgery, the aim was to evaluate safety and efficacy of laparoscopically managed hydatid cysts of liver, lung, spleen in our institutional experience.

Methods: All the patients with the hydatid cyst who consented were then included in the study. Diagnosis was made after thorough clinical examination and radiological investigations. ELISA for anti- *Echinococcus* antibodies showed positive titres as well. Due to extensive involvement, patients were also started on medical treatment with albendazole continuing post-operatively for 4-6 weeks. Demographic data, operative time, intra-operative complications, duration of hospital stay and post op follow-up was done and recorded.

Results: 10 patients underwent laparoscopic hydatid cyst draining with de-roofing and marsupialization of cyst, there were 6 females and 4 male patients with the mean age of 30 years. The average operative time was 45 minutes, no major complications were observed post operatively and mean hospital stay duration was 5 days.

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Introduction

Hydatid disease is caused when the tapeworm *Echinococcus* goes through its metacestode stage to form larvae. *E. granulosus* and *E. multilocularis* are the most important members of the genus in respect of their public health importance and their geographical distribution [1]. Most human infections worldwide are caused by *E. granulosus* that causes cystic echinococcosis. Echinococcosis can occur in any organ as primary echinococcosis or can be found elsewhere due to of metacestodes from primary sites (secondary echinococcosis) [2]. In adults, the liver is the most common location for the cysts, accounting for 70% of the cases, while the lungs are the second most common location (20%); other locations include the spleen and kidneys, which account for 2% each [3]. The life cycle of *Echinococcus* is indirect and involves two hosts, one definitive carnivore host and the other intermediate herbivore host [4]. The problem arises when

humans act as an accidental intermediate host and ingest viable oncosphere-containing eggs, which have been shed in the faeces of the definitive host i.e. canines. The oncospheres invade the intestines, enter the vasculature and develop into hydatid cysts in any organ or tissue, where a variety of symptoms can be produced. However, the liver acts as the first filter for hydatid larvae, making it the most commonly affected organ followed by lung [1] Figure 1.

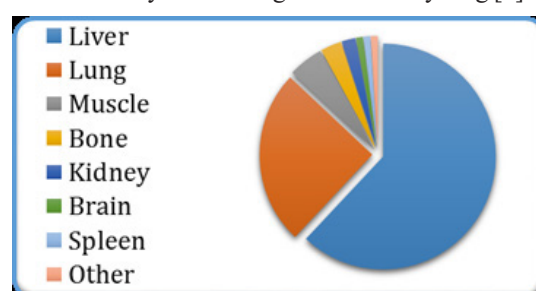


Figure 1: Filter of Hydatid Larvae

Most of the cases of liver hydatid cysts are asymptomatic and diagnosed incidentally, others may present with dull aching pain in right hypochondrium, palpable lump in right hypochondrium, Nausea/dyspepsia, unexplained fever and Jaundice. Patients with cystic lesions in lungs often present with intact cysts and calcified cyst producing no characteristic symptoms. Symptoms depend on size and site, Small, peripheral cysts produce no symptoms while large central ones produced pressure symptoms like acute chest pain, blood streaked sputum and non-productive cough. Splenic cysts, generally an incidental finding, are associated with dull aching pain in left hypochondrium, Left hypochondrial mass, dyspepsia / heartburn / dyspnea / constipation.

The diagnosis of cystic lesions is based on the patient's history, clinical findings, haematological (leukocytosis with eosinophilia), and serological testing (ELISA for anti- echinococcus IgM or Casoni's test for type 1 hypersensitivity reaction) , which may be negative in 10% to 20% of cases [5]. Supported with Radiological investigations like chest X-ray, USG, CT, MRI Angiogram, Direct Cholangiogram, Radionuclide scan and Immunoscintigraphy. Radical surgical removal of the cystic lesion remains the mainstay of treatment with a high success rate [6]. Chemotherapy, with benzimidazole compounds has also been used with some success to sterilize the cyst, decrease the chance of anaphylaxis, and reduce the complications and recurrence rate post-operatively. In recent years, a third treatment option was introduced (PAIR, puncture, aspiration, injection, and re-aspiration) and is indicated for patients who cannot undergo surgery [7]. Despite efforts to control hydatid disease in many parts of the world the disease continues to exert a heavy burden on human health, it has become a re-emerging public health issue in many countries with potentially life threatening complications.

Methods

The cases being reported presented to the department of general surgery, SMS Medical College, Jaipur, India, from January 2018 to December 2018. A total 10 hydatid cyst (7 were in liver, 2 in lung, 1 in spleen) were managed with laparoscopic approach. Additionally one rare case on inguinal hydatid cyst has also been reported.

Inclusion criteria- Patient presenting with hydatid disease with or without symptoms. (Documented in ultrasonography), Gharbi type 1, 2 and 3 cyst, peripherally situated Cysts and those between 5 to 15 cms size.

Exclusion criteria- A deeply situated intra- parenchymal cyst, Inaccessible posterior cyst, Cysts involving other organs and Gharbi type 4 and 5.

Cases

A total of 10 cases have been reported, of which 7 were in liver, 2 in lungs and one in spleen, and a rare case of inguinal cyst was also reported. Out of the 7 liver cysts Splenic cyst was reported in a male patient. The rare case on inguinal hydatid cyst was reported in a 14 year old boy. Mean operative time for laparoscopic management of hydatid cyst was maximum for splenic cysts i.e. 90 mins followed by lungs, 80 mins and liver being only 45 mins. Intraoperative complications were reported in only two cases of liver cysts i.e. spillage and anaphylaxis. Most common post-op complication reported was pleural effusion in one case of liver and lung cysts each. Mean duration of hospital stay was roughly 6 days for all the cases, with maximum of 10 f=days required for management of lung cysts. All the cases were followed up, and

none showed up with the recurrence even after 1.5 years of surgery.

Table 1 : Managment of 10 cases of Inguinal Cyst

Parameters		Liver	Lung	Spleen	Total
No of Pateints		7	2	1	10
Mean Age		34.6	40.5	15	30.03333
Sex Distribution					
	Male	3	1	1	5
	Female	4	1	0	5
Mean Operative time		45	80	90	71.666667
Intra-Operative Complication					
	Spillage	1	0	0	1
	Bleeding	0	0	0	0
	Anaphylaxis	1	0	0	1
Conversion to open		0	0	0	0
Post Operative Complications					
	SSI	0	0	0	0
	Bile Leak/ Fistula	0	0	0	0
	Pleural Effusion	0	1	1	2
Mean Durayion of Hospital Stay (Days)		3.5	10	5	6.1666667
Follow-up					
After 1.5 years	Recurrence	0	0	0	0

Patient Position and Procedure

Liver Cysts: Diagnosed on the basis of clinical examination and radiologic imaging. Standard pre-op protocol was followed for patient preparation. For hydatid cyst in right lobe of liver patient were positioned in supine and heads up (as in Laparoscopic cholecystectomy). In case of left lobe hydatid cyst patient were placed in modified lithotomy reverse trendelenberg with surgeon standing between the legs of patient. One 10mm epigastric camera port and additional. 2-3 working port were placed depending mainly on the cyst location and working field. Figure 2.

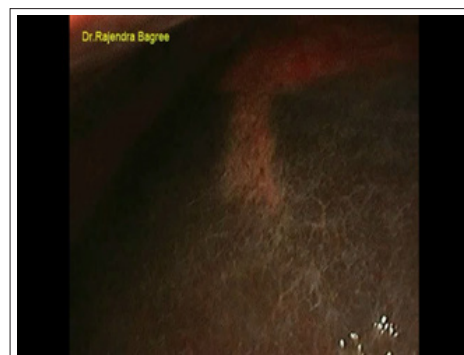


Figure 2: Radiologic Imaging of Liver Cysts

Lung Cysts: Diagnosed on the basis of clinical findings and radiologic imagings. Pre-op preparation was as per standard protocol. Patients were positioned in Left lateral position (45 degree) for right lung cysts and vice-versa. One 10mm camera port was positioned in mid-axillary line in 5th intercostal space and two 5 mm ports placed in 3rd and 6th intercostal space (photo), in midclavicular line. Lung sparing surgery was the procedure of choice with enucleation/pericystectomy. Unnecessary resection

of lung tissue must be avoided.

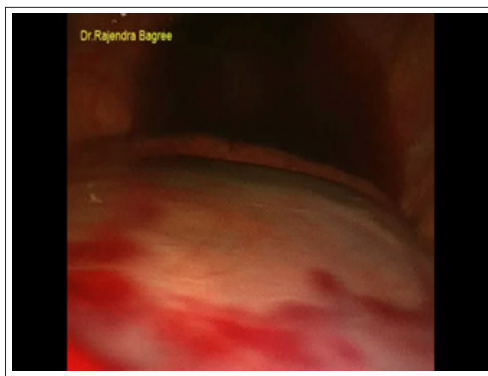


Figure 3: Radiologic Imaging of Lung Cysts

Splenic Cyst

With the patient in supine position, pneumoperitoneum was created through the umbilicus. The patient was then repositioned in reversed Trendelenburg with slight tilt to the right. Using a 30° lens, the lower pole of spleen was found to be adherent to greater omentum. Three more ports were created: a 10mm just below and left of the xiphoid cartilage and a 5 mm in the left subcostal border parallel to the umbilicus in the left mid-clavicular line Figure 4.

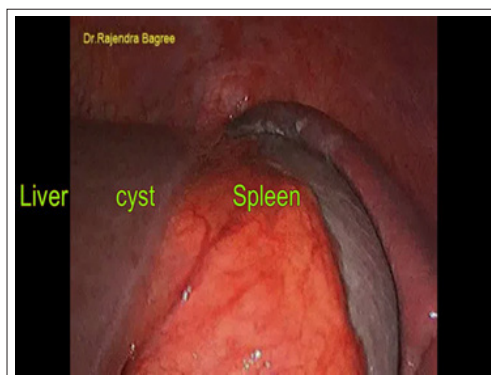


Figure 4: Radiologic Imaging of Splenic Cyst

Inguinal Hydatid Cyst

One rare case was reported in a 14-year-old boy with swelling in left groin region since 2 months with occasional pain and no h/o trauma. Upon examination, there was a left-sided groin region swelling 10x8 cm with lobulated surface, Tense Cystic, non-tender, non-reducible with no cough impulse. Differential diagnosis of inguinal hernia, Psoas abscess, Enlarged LN and Encysted hydrocele of spermatic cord were made. Ultrasonography showed 16*7*11 cm cystic mass in left inguinal region extending anterior to hip and upper thigh deep to femoral vessels, likely hydatid additionally, ELISA for anti-Echinococcal IgM was reactive. On exploration incision was made on most prominent part of swelling, cyst was present in the anterior abdominal wall just below subcutaneous tissue in groin region. Anterior wall of the cyst was punctured, Cyst wall, daughter cysts, and the laminated membrane were found inside the cyst. All contents were removed and scolicidal agent instilled into cyst leaving pericyst behind. Histopathology revealed endocysts with brood capsules Figure 5.



Figure 5: Radiologic Imaging of Inguinal Hydatid Cyst

Discussion

From a clinical point of view, clinical manifestations of hydatidosis in humans are variable, most patients seem to tolerate the infection for extended periods without any symptomatology, or they may suddenly show dramatic and acute symptoms [8]. All patients made an excellent recovery following surgical excision of the entire cystic masses. Adjunctive chemotherapy with albendazole 10-15 mg/kg/d and mebendazole 40-50mg/kg/d was done. Albendazole has been found ineffective in the treatment of primary liver cysts in patients who are surgical candidates, was prescribed for 4-6 weeks before surgery to sterilise the cyst and for 2 months post-operatively to reduce the recurrence rate. At the 18-month follow-up after surgery, the patient remained free of symptoms and continued to do well. On taking, haematological, biochemical, serological and imaging findings into account, some recommendations for more accurate and sensitive detection of clinical cases, regarding surgical management, can be made: (1) diagnosis is best accomplished by a combination of imaging, serologic, and laboratory investigations; (2) radiographic examination must be considered for patients in whom hydatidosis is a potential diagnosis; and (3) patients with equivocal history, physical findings, or laboratory results should not be considered negative unless there are no obvious positive radiographic findings. Thus, imaging methods play an important role as they are non-invasive, can detect cysts incidentally in asymptomatic and seronegative patients. USG is the imaging method of choice because of its low cost and high diagnostic accuracy of 90% [9]. It detects both single and multiple cystic lesions. The cysts have been classified according to Gharbi into six types according to its activity (CL and CE1 to CE5), which is useful in determining whether the cyst is active or not, monitoring the response to treatment and also for epidemiological purposes for detecting the prevalence in population studies. Therapy for Cystic echinococcus is based on viability, size and location guided by USG and holistic health condition of patient. In our cases, we have only done laparoscopic management of patients, which happens to be an ideal alternative to open surgery approach in properly selected patients. Laparoscopic management of hydatid cyst is a safe and effective option with all the advantages of minimal invasive surgery revealing better outcome. Important steps are evacuation of cyst contents without spillage, sterilization of the cyst cavity with scolicidal agents, and cavity management [10]. Compared to open surgery in the treatment of liver hydatid cysts, laparoscopic method have been found safe to perform even in large cysts and/or cysto-biliary communication [11].

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