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Laparoscopic Excision of Segment VII, VIII Liver Hydatid Cyst: A Novel Approach

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Abstract: ***Hydatid cyst disease of the liver is common in Indian subcontinent. Posterior segment liver hydatid cysts present a technical challenge in both open & Laparoscopic approach. We present a case of 49 years old male who presented with longstanding chronic dull aching pain in the abdomen .Computerised tomography revealed a posterior segment hydatid cyst of size 5.6 x 5.3 cms involving segments VII ,VIII. Patient underwent Laparoscopic excision. A brief case report & review of literature is presented.***

1. Introduction

Hydatid disease aka echinococcosis is zoonotic infection caused by cestode species of the genus echinococcus. There are four recognized species of which three are medically important for humans. Majority of infestations in humans is caused by E. granulosus, which causes cystic echinococcosis[1]. It is endemic in parts of South America, Middle East and Asian countries. In India highest prevalence is noted in Andhra Pradesh ,Saurashtra and Tamil Nadu.[2] Infestation by Echinococcus granulosus in humans most commonly occurs in liver(55-70%)followed by lung(18-35%).[3]

In cystic echinococcosis, humans are accidental host and are usually infected by handling an infected dog. Although most patients are asymptomatic, some may develop symptoms due to the compression of surrounding structures. Other symptoms of hydatid disease can result from the release of antigenic material. The cysts are characteristically seen as solitary or multiple circumscribed or oval masses on imaging. Surgical excision of the cyst is the treatment of choice whenever feasible.[1]

2. Case Report

A 49 years old male presented with history of pain in abdomen since 6 months. The pain was diffuse ,continuous and dull aching in nature, not associated with any aggravating or relieving factors. The patient did not have any other symptom like nausea, vomiting, weight loss or anorexia. On clinical examination patient was moderately build with weight-58 kgs and height-160cms and BMI-22.7.Patient neither had icterus nor any lump in abdomen clinically. Liver was not palpable. Patient had previously taken medical treatment at a private hospital where a CT scan revealed hydatid cyst of liver. Patient also gave history of being allergic to tablet albendazole which was started earlier & stopped later in a private hospital. His Investigations revealed normal liver function tests (T.Bil-0.4 mg%, SGOT-20 IU/L , SGPT-42 IU/L, Alb -3.6gm%) & normal urine and stool examination. His Ultrasonography (USG**)** abdomen & pelvis showed hydatid cyst of liver in segments VII ,VIII. His Contrast enhanced computerised tomography (CECT) of abdomen showed posterior segment liver hydatid cyst involving segments VII ,VIII measuring 5.6cm X5.3cm , multicystic lesion with multiple septae (honey comb sign) of the liver(Gharbi classification-Type III) (Fig.1).

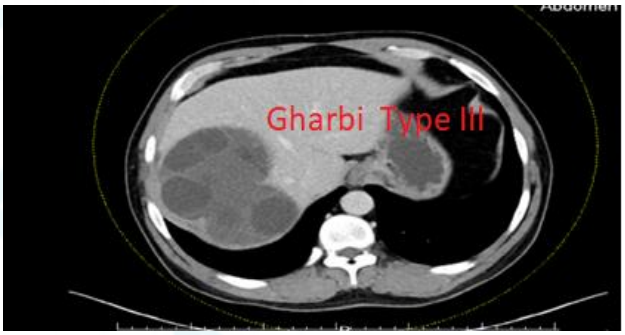

Figure 1

Patient was allergic to albendazole, hence was started on tablet Praziquantel 1200mg weekly (300 mg BID on Monday and Thursday). Patient was planned for laparoscopic excision of hydatid cyst. The difficult location of the cyst in segment VII&VIII was assessed by CECT to decide for the placement of laparoscopic ports to provide easy and safe access to the cyst and prevent spillage. Procedure was performed under general anaesthesia with tracheal intubation, prophylactic antibiotic was administered 30 minutes before the operation. The patient in split leg position with surgeon standing in between the legs and camera assistant standing on the right side of patient with assistant and scrub nurse standing on the left side of patient. First 10 mm port placement done through umbilicus , with open technique (Hasson's Technique) in supine position. Reverse Trendelenburg's position was given after pneumoperitoneum with right side up, the location of hydatid cyst identified, under vision another 10 mm port inserted at the right hypochondrium in mid axillary line as near as possible to the cyst and used as working channel, and two additional ports inserted in epigastric region 10 mm and in right hypochondrium 5 mm in midclavicular line port inserted (Fig. 2A and 2B)

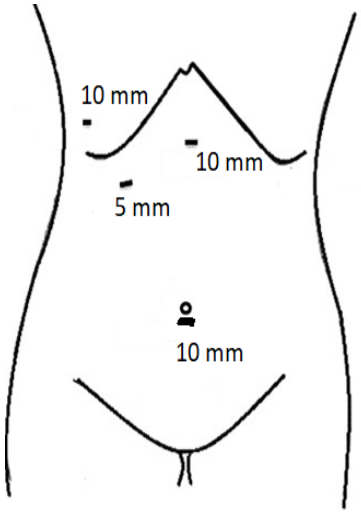

Figure 2 (A)

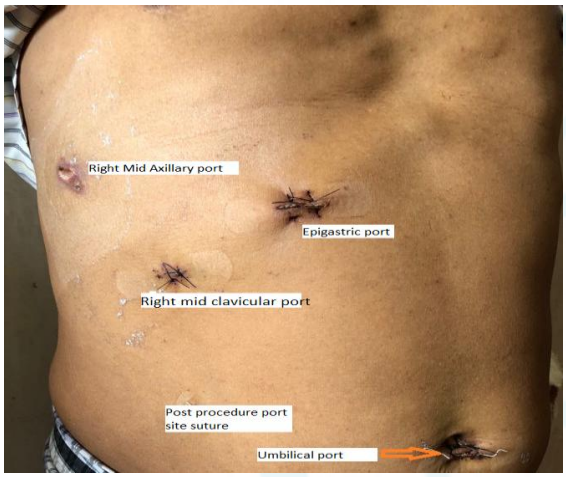

Figure 2 (B)

Cyst was separated from the diaphragm using harmonic scalpel. From the right hypochondrium port, gauze soaked with Savlon (mixture of cetrimide 0.50%w/w and chlorhexidine gluconate 0.10% w/w) as a scolicidal agent were introduced into the abdominal cavity and placed around the cyst. The cyst was punctured with long laparoscopic needle through the hypochondrium port; and a suction was introduced through the right 10 mm port to avoid accidental spillage of the cyst content. Cystic fluid was aspirated and then Savlon was injected inside cyst via the same needle then re-aspirated (Fig. 3). This procedure was repeated till no cyst aspiration and then the needle was withdrawn, which was still connected to suction to prevent back spillage from needle. Then the deflated cystic wall was deroofed using electrocautery and the laminated membrane was carefully removed, put in a bag and retrieved through epigastric port. The telescope was inserted into the cyst cavity to exclude any biliary communication or retained daughter cysts through the right hypochondrium port. The cystic cavity was irrigated with Savlon & normal saline. A drain was placed in the remaining cystic cavity and placed gauzes were removed. The operative time was 120 min and postoperative period was uneventful.

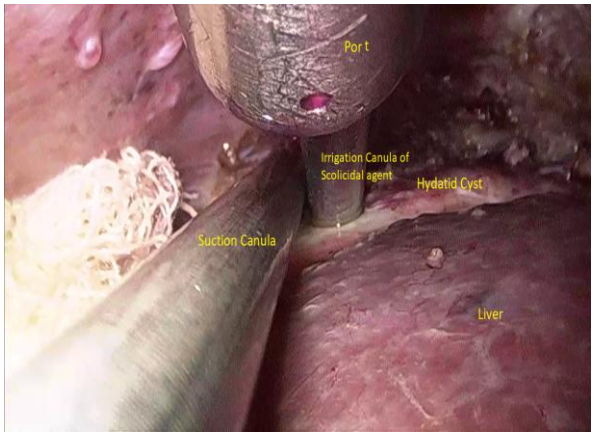

Figure 3

Figure 4

Patient was mobilised on same date with oral fluid intake allowed next day of operation. Drain was removed five days after operation . Patient discharged on seventh post-operative day on tablet Praziquantel 1200mg weekly for 12 week (300 mg BID on Monday and Thursday) with the patient educated regarding diet and hygiene. Cystic echinococcosis was confirmed by postoperative pathology.(Fig. 4) Follow up of six months has shown him to be symptom and disease free both clinically and radiologically.

3. Discussion

The treatment of hepatic echinococcosis has evolved over decades and we have multiple options (including medical treatment, percutaneous aspiration instillation & reaspiration (PAIR), or a combination of these two) done under Ultrasonography guidance. Gharbi gave classification of Hydatid cysts based on its radiological findings[4].

Gharbi	WHO	US characteristics
Type 1	CE1	Unilocular cyst + wall + internal echogenicities
Type 2	CE3	Detached membrane
Type 3	CE2	Multivesicular, multiseptated cyst, daughter cysts
Type 4	CE4	Heterogeneous cyst, no daughter vesicles
Type 5	CE5	Cyst with a wall calcification

WHO: World Health Organization, CE: Cystic Echinococcosis.

However, surgery remains the mainstay treatment for hydatid disease[5,6]. Due to the development in technology both endovision & electrosurgical devices along with better training of surgeons in laparoscopic surgery, laparoscopy is becoming the choice of treatment for liver hydatid disease.

Initially, laparoscopy was not quickly accepted or widely used in the treatment of hydatid disease due to the concern of higher recurrence rate and the risk of intraperitoneal dissemination than with the conventional approach[7,8]. Therefore different authors have accepted the use of pre- and 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[9,10]. In fact, the real risk of spillage is lower than might be expected[11], and the short-term recurrence rate varies between 0 and 9 % after laparoscopy, whereas in open cases, it is higher (0–30 %)[12,13]. Laparoscopic approach to hydatid disease complies with the basic surgical principles of treating liver hydatid, including prevention of spillage, complete evacuation of hydatid cyst content (parasite) and efficient management of residual cavity. [5-7]

Another great advantage of laparoscopic treatment is that the laparoscope can be inserted inside the cystic cavity, allowing its inspection. The image of the pericystic cavity's interior displayed on monitors actually is two to three times larger. If a biliocystic communication is observed, it can be approached by applying a clip or suturing it. Also, remnants of the germinal membrane can be identified and removed, reducing the incidence of recurrence or suppurative complications. In present case there were no biliocystic communications on visualization of the interior of the cyst by introducing the scope directly into the cyst cavity.

Florin Zaharien et al[14] in their study have reported a morbidity rate significantly low in the laparoscopic group, mainly due to a lower incidence of abdominal wound complications (0 vs. 8.72 %, p = 0.015) and general complications (0 vs. 5.23 %, p = 0.023). No disease- or procedure-related mortality occurred in the minimally invasive treatment group in their study. Similar results have been reported by Palanivelu et al[10] and Baltar Boilève et al[15] in their series. In the present case, patient was discharged on 7th postoperative day without any complications.3 month follow up scan was normal and did not show any recurrence and patient tolerated praziquantel therapy well.

Bostanci O et al[16] in his series have reported a mean operative time of 89 $\pm$ 28 min for laparoscopic versus 144$\pm$19 mins for open surgery for hydatid disease. Similarly the mean hospital stay for laparoscopic procedure was 3.38$\pm$0.7 days and 8.81$\pm$5.4 days for open technique. Present case was completed within 120 mins by laparoscopy and discharged on 7th postoperative day. Besides this most severe respiratory disturbances in terms of PaO2 decrease, activating compensatory hyperventilation, pulmonary shunt, the highest visual analog score (VAS) pain score and increased consumption of tramadol following surgery were induced by following upper abdominal incision and subcostal incisions was proven by Mimica Z et al[17]. Laparoscopic approach is therefore a novel approach for segment VII, VIII hydatid cyst treatment.

4. Conclusion

Treatment should be customised to the morphology, size, number and location of cysts. Application of this technique using initial ports to localise the cyst & latter ports for therapeutic procedure is done in a guarded manner which allows intracystic magnified visualization of the cyst & biliary communications which can be easily tackled. Present outcome shows that safety and efficacy of laparoscopically treated hydatid cysts of posterior segment of the liver is better than open approach. This avoids incisions in subcostal region which decreases post-operative respiratory complication & morbidity. Laparoscopic approach reduces hospital stay as compared to open approach.

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Legends of Figures

Fig. 1 CT scan showing posterior segment liver hydatid cyst involving segments VII , VIII measuring 5.6cm X5.3cm
Fig. 2a & 2b. Port position for laparoscopic hydatid cyst excision
Fig. 3. Intraoperative picture showing aspiration of hydatid cyst fluid
Fig. 4. Specimen of hydatid cysts removed laparoscopically.