



SYNCHRONOUS LAPAROSCOPIC PARTIAL PERI-CYSTECTOMY FOR LIVER HYDATID CYST AND CHOLECYSTECTOMY FOR CHOLELITHIASIS :- A CASE REPORT WITH REVIEW OF LITERATURE .

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ABSTRACT Hydatid cyst of liver is a common condition, so also cholelithiasis. However their occurrence in same patient is scarcely reported in literature. Laparoscopic Cholecystectomy is well established; however issues pertaining to laparoscopic liver hydatid surgery remain. There are very few reports of synchronous or simultaneous laparoscopic surgery for liver hydatid cyst and cholelithiasis. There have been concerns of safety issues which we have addressed to. Due to paucity of literature we report one such case of synchronous laparoscopic partial peri-cystectomy for liver hydatid cyst and cholecystectomy for cholelithiasis with review of literature.

KEYWORDS : Synchronous Laparoscopic Surgery, Liver Hydatid Cyst, Laparoscopic Cholecystectomy.

INTRODUCTION -

Cholecystectomy for gall stones disease is perhaps the commonest surgical procedure performed and laparoscopic cholecystectomy is now considered as the Gold Standard. However laparoscopy for hydatid cyst of liver was introduced later. As the technology and experience evolved, the benefits of laparoscopy were extended to surgical management of liver hydatid cysts. A variety of procedures are reported in literature and there are concerns of the efficacy and safety in a given case. Selection of procedures and proper technique tailored to suit individual case are important. With gain in experience the surgeon can take additional laparoscopic procedures in the same sitting safely. In this case report, we present a combination of laparoscopic cholecystectomy with partial peri-cystectomy for a large hydatid cyst of liver.

CASE REPORT -

A 62 years old female patient, non-smoker, vegetarian, farmer by occupation, was referred to our Institute, with history of dull aching pain, off and on, in upper abdomen since six months. No history of jaundice, fever, weight loss or any acute episode of pain. No significant past history, no known co-morbidities.

On clinical Examination, there was a palpable lump in continuity with liver edge, in right hypochondrium, (as depicted in Fig.1), non-tender, firm with smooth surface, well defined lower border. Upper border of liver dullness was in 4th intercostal space. No other intra-abdominal lump was palpable. There was no free fluid in abdomen. Clinically there was no icterus. Chest examination was essentially normal. Diagnosis was established on basis of CECT and Ultrasonography of abdomen. She was investigated further for PAC - CBC, KFT, LFT, Serum electrolytes, Coagulation Profile, Viral Markers, ECG, X-Ray Chest and RT-PCR were essentially normal.



Fig.1 - Clinical Photograph showing a palpable lump and Liver edge in right hypochondrium.

CECT Abdomen revealed, 14.5 X 10.8 cm large well defined, thin walled, complex cystic mass lesion, in right lobe of liver - segments 5, 6, 7 with thin walled daughter cysts and few heterogeneous calcific areas were seen. Intra & Extra hepatic biliary radicals & CBD were normal. Features were suggestive of Gharbi Type - 3 Hydatid cyst (Fig. 2, 3, 4, 5). Ultrasonography confirmed presence of multiple gall bladder calculi; largest was of 12 mm size.

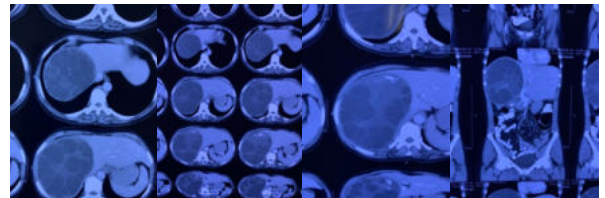


Fig.2, 3, 4, 5 - CECT Abdomen - 14.5 X 10.8 cm large, complex cystic mass lesion in right lobe of liver.

Treatment with Albendazole was given 10mg / kg / day (600 mg) for 2 weeks, pre-operatively. Informed written consent was taken for Surgery and Anaesthesia.

STEPS AND TECHNIQUE OF LAPAROSCOPIC SURGERY -

Four ports were used. (1) infra-umbilical 10 mm camera port, (2) a 10 mm left hand port in epigastric region, (3) a 5 mm right hand port in right hypochondrium laterally, (4) Forth port for PHS 12 mm was inserted after the cyst wall was seen, and placed in the most direct access point, in RHC region. Diagnostic Laparoscopy was performed, initially. Hydatid cyst wall and junction with normal looking liver was visualised. (Fig.6.) Four Betadine 10% soaked packs were placed above the cyst wall, by side, and two below the liver edge. Besides this, an endobag was also placed under the liver (Fig. 7). As the gall bladder and related structures were well visualized (Fig. 8 & 9); Cholecystectomy was performed as the first procedure. Another reason was, to avoid use of contaminated instruments and instruments trolley for gall bladder surgery, if done as a second procedure, after hydatid cyst surgery. After informing the Anaesthetists, the cyst wall was punctured, fluid was aspirated and 50% of volume was replaced with 10% Betadine (Fig-10).

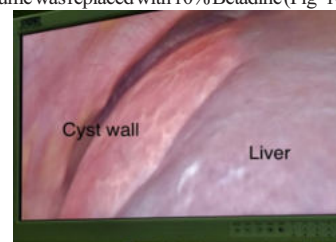


Fig.6. - View of cyst wall and junction with normal looking liver.



Fig.7. - Four Betadine 10% soaked packs were placed above the cyst wall, by side, and two below the liver edge. Besides this an endobag was also placed under the liver.

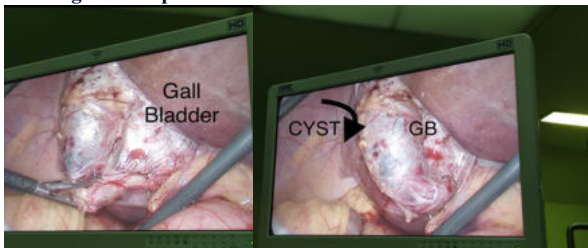


Fig.8,9.- As the GB and related structures were well visualized cholecystectomy was performed, as first procedure.

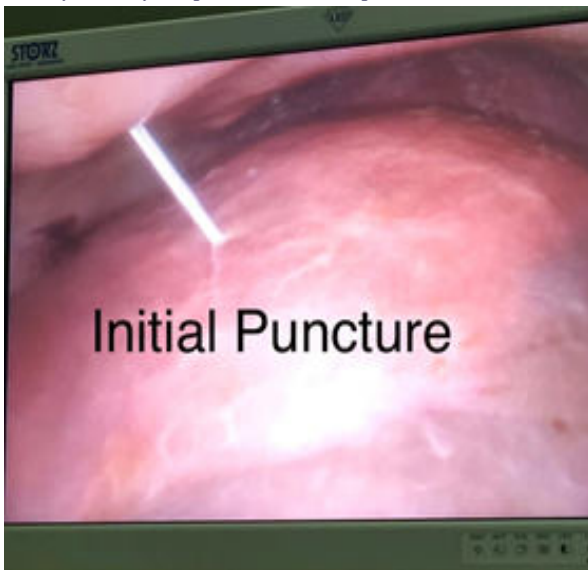


Fig.- 10. The cyst wall was punctured fluid aspirated and 50% of volume was replaced with 10% Betadine.

Insertion of Palanivelu Hydatid System (PHS) in the Hydatid cyst (Fig- 11) and Suction and Evacuation of the contents of cyst - This is the most crucial step in hydatid surgery and needs to be performed patiently. Ensure there are two powerful suction machines ready. Once the PHS is introduced inside the abdomen, withdraw the trocar into the cannula. Push the cannula against the cyst wall and connect the suction to suction channel of PHS thereby creating a seal between cyst wall and cannula. At the same time introduce a 10 mm suction cannula via left hand port and keep it close to the entry point of PHS. This is to suck any fluid in case of leakage during insertion of PHS. Once all is set, push the trocar inside the cyst cavity and almost simultaneously the cannula. Once the cannula is in the cavity, the trocar is almost immediately withdrawn, proximal to the opening of the side suction cannula in PHS, allowing suction and evacuation of the contents of cyst.

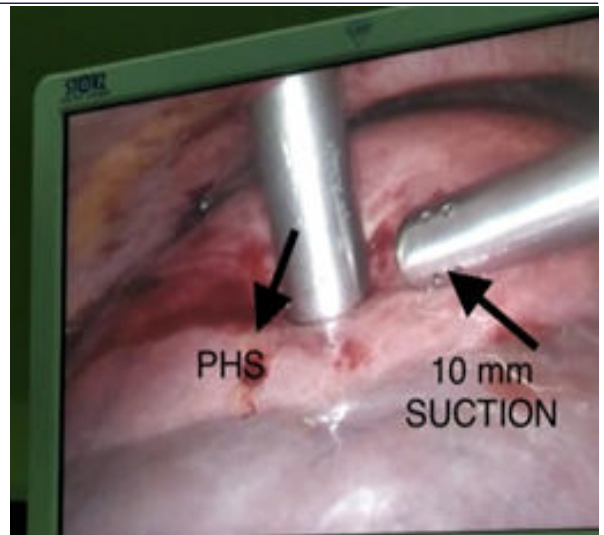


Fig.-11. Insertion of PHS (Palanivelu Hydatid System).

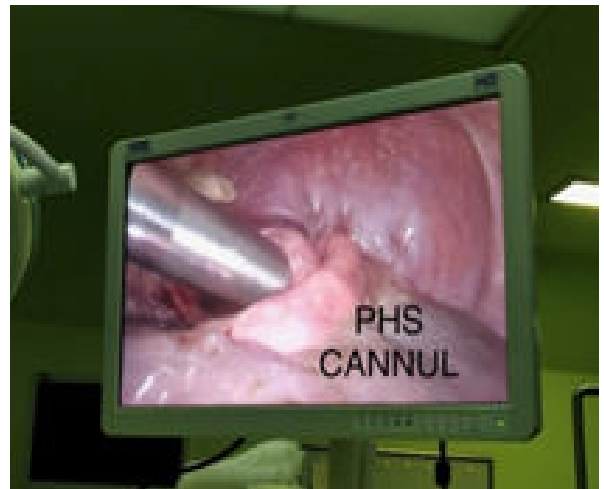


Fig.-12. Collapsed hydatid cyst after suction and evacuation with PHS cannula in situ.



Fig.-13. Cyst was opened using harmonic and Suction and Irrigation under direct vision was done.

After performing suction and evacuation of the contents from the cyst, a collapsed cyst with PHS cannula in situ was visualised (Fig-12). This Cyst was then opened using Harmonic. Suction and Irrigation was done, under direct vision using 10mm - 30 degree telescope and 10mm suction (Fig-13). Any remaining debris, daughter cysts, or laminated membrane was sucked away. The walls were carefully examined for any bile leak, which is suggestive of cysto-biliary communication. Using a Harmonic, the wall of the pericyst was excised, close to the liver edge thereby de-roofing the whole cavity. The procedure was almost bloodless. The pericyst wall was placed into the endobag (Fig- 14) and retrieved (Fig - 15). Nearby omentum was packed inside the cavity and a wide bore abdominal drain was placed inside the cavity. Per-operative course was uneventful.



Fig. - 14. Cyst wall excised close to liver tissue and placed in endobag.



Fig. - 15. - Delivery of specimen

Post operative period was also uneventful. Patient was ambulated and allowed orally next day. Pain was minimal and did not require injectable analgesics after 24 hrs. She was given intravenous broad spectrum antibiotics for 3 days and was discharged on Albendazole 600 mg daily for 4 weeks. The abdominal drain discharge was bile stained for about 4-5 days and later was serosanguineous 50-100 ml/day. Drain was removed on 10th post-operative day, when discharge was nil and Ultrasonography revealed no intra-abdominal collection.

She was asymptomatic in later post operative period. A follow up Ultrasonography was done 8 weeks later, showed a 3/4th reduction in cavity size, rest of abdomen essentially normal.

HISTOPATHOLOGY -

Consistent with diagnosis of Hydatid cyst with Chronic Calculus Cholecystitis

DISCUSSION :-

Cholecystectomy for gall bladder disease is perhaps the most common surgical procedure performed. Laparoscopic Cholecystectomy is now the Gold Standard due to benefits of early recovery, less post operative pain, shorter hospital stay with early resumption of normal activities.

Human hydatid disease is a chronic parasitic infection caused by the larval stage of the cystode Echinococcus granulosus. Liver hydatidosis is one of the common causes of acute abdomen in endemic areas. However in non-endemic areas, most of the cases are asymptomatic and are detected accidentally or may present with non specific symptoms in form of nausea, dyspepsia, vague abdominal discomfort as in our case.

The commonest site of hydatid cyst in humans is liver (50-93%). Most cysts of liver are univesicular (62.5%) and single cysts occur most often in the right lobe (80.77%), because of the specification for visceral venous confluence¹. Many are asymptomatic and most symptomatic cysts are larger than five cm diameter.

Ultrasound and CECT are effective imaging modalities for detection of liver hydatid disease. MRI or ERCP may confirm if biliary involvement is suspected.²

There are various classifications of the sonographic appearance of hydatid cyst disease. The first and most widely used being proposed by Gharbi³ in 1981 (Table -1). In 2003, the World Health Organization - Informal Working Group on Echinococcosis (WHO-IWGE) proposed a standardized US classification based on the active-transitional - inactive status of the cyst as suggested by its sonographic appearance.⁴

Table 1. - Gharbi classification of hydatid cysts.³

Type I	Pure fluid collection – univesicular cyst
Type II	Fluid collection with a split wall - detached laminated membrane - “water lily” sign.
Type III	Fluid collection with septa - daughter cysts.
Type IV	Heterogeneous appearance - presence of matrix - mimics a solid mass.
Type V	Reflecting thick walls - calcifications.

Table 2 - World Health Organization Informal Working Group on Echinococcosis (WHO-IWGE) standardized US classification⁴ –

In this classification, six cyst stages have been assigned to three clinical groups :

1	The 'active' group	includes developing cysts, which may be unilocular (CE1) or multi-vesicular with daughter vesicles (CE2) and which are usually found to be viable.
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2	The 'transitional' group (CE3) -	includes both cysts with detachment of endocyst (CE3a) and predominantly solid cysts with daughter vesicles (CE3b).
3	The 'inactive' group (CE4 and CE5)	exhibits involution and solidification of cyst content with increasing degrees of calcification and are nearly always found to be non-viable.

Modalities of management include drugs and surgical intervention which remains the mainstay of treatment for hepatic echinococcosis. Various surgical procedures have been described in literature tailored to suit individual case; ranging from PAIR (Percutaneous Aspiration – Injection and Re-aspiration) to radical liver resection. The conventional operative procedures include Enuclation, Cystectomy, Evacuation, Marsupialisation etc.; however it has more morbidity due to a long laparotomy wound and longer hospital stay.

The principle of Laparoscopic surgery was extended to management of Liver Hydatid disease. Bickel A et al has described the first laparoscopic surgery for hydatid cyst of liver.² The surgical treatment of liver hydatid disease has evolved dramatically with the improved techniques of the laparoscopy. Laparoscopy should be judiciously used as chances of spillage and dissemination are more. Chances of spillage and subsequent anaphylactic reaction had discouraged surgeons to practice laparoscopic surgery in the management liver hydatid cysts.

Combination of laparoscopic procedures along with hydatid cyst surgery is scarcely reported. As reported by Aliaa Bakr et al, combination of laparoscopic partial peri-cystectomy of a hydatid cyst of liver and cholecystectomy may be considered as safe procedure in selected cases.³ Various combination of procedures are described in a review article, out of 914 cases, combination with cholecystectomy was done in 35 cases.³ Combination of laparoscopic cholecystectomy, partial cystectomy for liver hydatid cyst, unroofing, omentopexy and umbilical hernia repair is also reported.⁶

Not all the cases of liver hydatid cysts are amenable for laparoscopic surgery. Large Superficial cysts including Gharbi -Type I and II liver hydatid cysts are ideal for laparoscopic surgery. Laparoscopy may not be the procedure of choice for - small cysts < 3 cm, the deep-seated cysts; posteriorly located cysts (segments I, & VIII); and cysts characterized by Gharbi classification as type IV or type V, multiple liver hydatid cysts , and patients with coagulation abnormalities.¹

Partial peri-cystectomy with total cystectomy for liver hydatid cysts were recently described in detail as one laparoscopic procedure; this approach did not show a higher risk or much difficulty in the prevention of hydatid spillage, sterilization and evacuation of the parasite or in the management of the residual cavity.³

As one study has shown, laparoscopic management of liver hydatid cyst is a simple and safe procedure with definitely lesser morbidity and early return to work. The complications are few and favorably compare with those of open procedure. In this study they found post-operative bile discharge to have a correlation with cyst size. Cysts larger than 7 cm. were usually found to have a biliary communication as evidenced by bilious discharge post-operatively. One of the patients had cholelithiasis along with the hydatid cyst. Both the procedures could be dealt at same time by laparoscopy thus establishing it as a safe and reliable procedure to deal these two co-morbid conditions.²

In other study it was reported that post-operative bile leakage and fistula formation are a result of cysto-biliary communication (CBC) due to intra-biliary rupture (IBR) of the cyst, and this is most common complication of surgery for liver hydatid cyst. Incidence of postoperative bile leakage is between 2.5 and 28.6%. Postoperative biliary fistula is the major cause of prolonged hospitalisation and complications requiring intervention after hydatid surgery. However, fistulas may close spontaneously in the first postoperative week.⁷ Occult CBC is usually asymptomatic and clinical suspicion is essential for its diagnosis. There are few studies investigating the predictive factors for CBC. Older age, larger cysts, and presence of multiple and bilobar cysts are associated with increased intra-biliary rupture rates as reported by Akcan et al. However, El Nakeeb et al. suggested that only the cyst size (>10 cm) is a significant predictor for CBC, regardless of the type.⁷

In a review of 301 cases, author's analysis showed that a high pre-operative alkaline phosphatase (ALP), history of cholangitis, and a

larger cyst diameter (>10 cm) were significantly more common in patients who developed post-operative biliary fistula (PBF). In cases of clinical suspicion and presence of predictive factors, further investigations can be planned such as MRCP or endoscopic retrograde cholangiopancreatography (ERCP).⁷

In our case there was no evidence of any biliary communication clinically and on pre-op imaging (no cholestasis, biliary dilatation, jaundice or cholangitis). No evidence was found during surgery in spite of direct visualization of entire wall of cavity. The abdominal drain discharge was bile stained for about 4-5 days and later was serosanguineous 50-100 ml/day. Drain was removed on 10th day when discharge was nil and Ultrasonography revealed no intra-abdominal collection. The patient was asymptomatic in later post operative period. A follow up Ultrasonography done 8 weeks later, showed a 3/4th reduction in cavity size, rest of abdomen essentially normal.

There are many instruments described for laparoscopic surgery of liver hydatid cysts to evacuate the daughter cysts, laminated membrane and other contents from the cyst cavity; e.g. a perforator-grinder-aspirator apparatus described by Saglam and another one designed by Zengin et al.² The main concerns of the surgeon are, intra-operative localisation, preventing any spillage, complete evacuation with no residual daughter cysts or membrane, to identify any cysto-biliary communications and be able to deal with it. The Palanivelu Hydatid System (PHS)⁸ has the advantage of removing all the cyst contents without the fear of spillage as it gives a total contamination free field throughout the procedure, its wide bore cannula ensures suction of thick membranes and debris, one can use the port for telescope or 10mm suction which can be used under direct vision.

However, proper case selection, use of proper instruments like Palanivelu Hydatid System (PHS), proper technique, and sufficient laparoscopic experience and a good setup are prerequisites for better results.

CONCLUSION-

The synchronous or simultaneous laparoscopic procedures with liver hydatid cyst surgery may be safe in certain selective cases.

Our report shows that these combined surgeries will not increase the risk of intra or post-operative complications like surgical site infection, spillage or even the recurrence.

REFERENCES:-

1. Paweł Osemek , Arkadiusz Chmieliński, Krzysztof Paśnik, Rafał Kidziński. Single Hydatid Cyst Of Liver Managed With Laparoscopy – A Case Study. *Videosurgery and Other Minimally Invasive Techniques*. 2011; 6 (4): 264-267. DOI: 10. 5114 / wjmt. 2011. 26264.
2. Biren Prasad Padhy, Parvez Alam Khan. Laparoscopic Management of Hepatic Hydatid Cysts. A Single Centre Observational Study. *Indian Journal of Applied Research*. 2016; 6 (9): 368-371.
3. Aliaa Bakr , Mhd Belal Alsabeka, Abdul Rahman Hammadih. Simultaneous Laparoscopic Partial Pericystectomy And Cholecystectomy: Is It Safe? - A Case Report. *International Journal of Surgery Case Reports* 2019; 57 : 190–193.
4. Enrico Brunetti , Francesca Tamarozzi , Calum Macpherson , Carlo Filice, Markus Schindler - Piontek , Adnan Kabaalioglu et al. Ultrasound and Cystic Echinococcosis. *Ultrasound Int Open* 2018; 4: E70–E78.
5. Tuerhongjiang Tuxun, Jin-hui Zhang, Jin-ming Zhao, Qin-wen Tai, Mierxiati Abudurexti, Hai-Zhang Ma, Hao Wen. World Review Of Laparoscopic Treatment of Liver Cystic Echinococcosis - 914 Patients. *International Journal of Infectious Diseases*. 2014; 24: 43–50.
6. Ibrahim Tayfun Sahiner, Mesut Bala, Murat Kendirci, Settar Bostanoglu, Mete Dolapci . All in One Surgery, Laparoscopic Cholecystectomy, Partial Cystectomy For Liver Hydatid Cyst, Unroofing, Omentopexy And Umbilical Hernia Repair. 8th National and 1st international Congress of Hydatidology. April 2017, Corum, Turkey.
7. Can Konca and Deniz Balci. Biliary Complications of Hepatic Hydatid Cyst Surgery and Prevention Methods. <https://www.intechopen.com/books/echinococcosis/biliary-complications-of-hepatic-hydatid-cyst-surgery-and-prevention-methods>.
8. Palanivelu C, Senthilkumar R, Jani K, Rajan PS, Sendhilkumar K, Parthasarathi R, Rajapandian S. Palanivelu Hydatid System For Safe And Efficacious Laparoscopic Management of Hepatic Hydatid Disease. *Surgical Endoscopy*, 2006; 20 (12):1909-1913.