



## Original Article

## The Evaluation of Treatment Efficacy of the Laparoscopic Interventions for Hepatic Cystic Echinococcosis

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## ABSTRACT

For the treatment of the Cystic Echinococcosis (CE) different surgical and non-surgical approaches are present. Laparoscopy has replaced the conventional open surgeries that were highly used in the past. This chronic liver infection is caused by the cestode. This disease is increasing the mortality and morbidity cases. **Objective:** To evaluate the treatment efficacy and complications in patients experienced during the postoperative period. The recurrence rate of the laparoscopic treatment was also calculated. **Methods:** A total of 24 patients visited the Islam Medical College Sialkot from June 2019 to March 2021 were included in the study. The patients were pre-treated with the albendazole (10mg/kg) for almost one week. Then the Palanivelu hydrated system was used for the laparoscopic partial peri cystectomy. Postoperative complication was classified on the basis of the Clavien-Dindo classification system. **Results:** The calculated mean age of the 24 patients that participated in the study was  $34 \pm 15.6$  years. The included patient's age was between 17-76 years. Out of 24, 17 were males and other 7 were females. The 21 patients belonged to the hilly areas. The 19 patients reported the complaint of abdomen pain. While cyst at the right side of the liver was observed in the 90% cases. Abdominal pain and cyst formation were the most common symptoms and pathology reported in the patients. The  $10.4 \pm 3.1$  was the calculated mean size of the cyst. The calculated mean operative time was  $80.8 \pm 19.8$  (60-20) minutes. According to WHO grading of cyst the 4 patients were included in the group with unilocular cyst, while the 7 patients were included in the CE1 hydatid group. **Conclusions:** The study proved that the laparoscopic treatment is an effective treatment for the hepatic CE. This treatment has reduced the risks of recurrences, mortality and conversion in the treated patients.

## INTRODUCTION

Cystic Echinococcosis (CE) is also commonly known as hydatid disease. The larval stage of the taenid cestode is involve in causing this chronic infection. The metacestode belong to the genus echinococcus. This disease is highly observed in the temperate countries of Australia, Europe and South America [1,2]. It is an endemic disease. Because of the close association between the cultural and socioeconomic in the hilly areas of Pakistan, the people are more prone to the development of the infection [3]. Homo sapiens are the intermediate host of the cestode. This germ transmits through contaminated water, improperly

cooked food and hand to mouth fecal transmissions. The cyst is developed from the larval stage of the tapeworm. These cysts develop in different organ of the human body. Liver are more prone to cyst development with the incidence of 70%, while lungs share the second highest rank with the 20% probability. Kidney, spleen and heart show less incidence of cyst development [4,5]. The most commonly observed symptoms in the hepatic CE infected patients are abdominal pain and jaundice. Despite of the advances in the field of diagnostic and intervention therapies surgery is usually recommended to the patients

for the removal of the large cyst before rupture. Different types of surgeries such as open, laparoscopic total and partial per cystectomy are suggested to the different patients [6]. Sometimes the combination of chemotherapy with puncture injection and aspiration also used to percutaneous drainage of the cysts. The Magnetic Resonance Imaging (MRI) and computed tomography (CT) has enhanced the in-depth understanding of anatomical segmentation and imaging. For the radical resection of the lesion the total per cystectomy partial hepatectomy are considered more effective treatment therapies with fewer complications and little trauma. Fewer studies have reported it as the non-invasive or minimally invasive treatment therapy [7,8]. Because of the increased risk of residual cavity complications associated with the laparoscopic surgery, its acceptance is limited. Anaphylaxis, improper evacuation of the cyst and recurrence fears have further limited these approaches. Few centers in Pakistan are practicing these laparoscopic interventions. This study has evaluated the recurrences and post-operative outcomes associated with laparoscopic interventions [9,10].

## METHODS

This was a prospective study conducted at Department of Surgery, Islam Medical College Sialkot. The 24 patients attended the surgery department of our institute teaching hospital were included in the study. In this prospective study the patients presented with the hepatic CE from June 2019 to March 2021 were treated by partial per cystectomy. The patients diagnosed with the hepatic CE by either enzyme linked immunosorbent assay, Ultrasonography or computed tomography passed the inclusion criteria of the study. The ethical committee of the hospital approved the study. The exclusion standards were applied on the patients having general anesthesia complication, cyst biliary communications and posteriorly located cysts. The patients younger than 16 years were also excluded from the study. Clinical, radiological and serological approaches were used to diagnose the hepatic CE. The WHO-IWGE classification were used for the classification of the cyst size, location and type. The patients included in the study were pre-treated with the albendazole (10mg/kg) for one week before the surgical interventions. This treatment remains continue after the surgery for four weeks (three cycles) at the interval of the two weeks. By using general anesthesia, the umbilical and epigastric ports were created. The fluid was aspirated by using palanivelu hydatid system, the 10% betadine solution was filled in the cavity and re-aspirated. The monopolar diathermy and laparoscopic hook facilitated the partial per cystectomy surgery. The Endoscopic Retrograde

Cholanigio-pancreatography (ERCP) with sphincterotomy and Common Bile Duct CBD stenting was performed for the patients in which persistent and bilious drain were seen for more than two weeks. The surgical, intraoperative and radiological findings were reported for each patient. The patients were followed up for the six months to twelve months. The recurrences were reported for such patients. The re-appearance of the cyst or development of new cyst is defined as the recurrence. The complications were classified according to the Clavien-Dindo classification system. The Grade III complications were labeled as major, while other lower than the grade III were marked as minor complications. The statistical analyses were carried out by using SPSS latest version. The 0.05 p-value were labelled as significant value.

## RESULTS

There were total 24 patients that contributed in this study. Written consent was taken from the patients. There were 17 females (70%) and remaining 7 (30%) patients were male. The mean age of the participating candidates was also calculated and it came out to be  $34 \pm 15.6$  yr. the age ranged from 17-76 years in case of patients. Most of the participating patients were from northern and other hilly areas. The patients belonging to hilly areas were 22 (91%) and the remaining patients were from other regions. As far as clinical presentation is concerned, the participating individuals mostly complaint about abdominal pain (n=19) that is 40%. These patients also complaint that the slight abdominal pain led them to face issues like lump in the abdomen in case of 41% of the participating patients. Fever was found only in one of the patients. There was only one case where incidental detection took place while doing ultrasonography for some other disease, Table 1.

Clinical parameters	No. of patients (%)
Pain in the abdomen	19 (40%)
Abdominal lump	20 (41%)
Incidental finding	1 (4%)
Fever	1 (4%)

**Table 1:** Clinical parameters of the patients suffering from hepatic CE

The procedure of ELISA was found to be in only 12 cases in almost 45% of the population. There were more than 20 patients (90%) that had detection of cyst in their right side of hemi liver. Whereas there were 2 patients that had cyst present in the left side of the liver lobe, Table 2.

Cyst location	Single	Multiple	No. of patients (%)
Right hemi-liver	18	5	23 (95%)
Left hemi- liver	1	0	1 (4%)
Both sides cysts	1	0	1 (4%)
Total	20	4	24 (100%)

**Table 2:** The general features of the cyst present in the liver

The number of patients that had cyst found in both sides were 20 while multiple of them (80%) had cysts in the hemi liver region. Most of the cysts were from class CE3 while there were 26%, 27% and 5% of other categories of cyst also found like CE2 and CE1 respectively, Table 3.

WHO grading	No. of patients (%)
CL that includes (No wall, cyst that is unilocular)	1(4%)
Ce1 hydatid sand	7(24%)
Ce2 (multiseptated and multivesicular cyst)	7(24%)
Ce3 having detached membrane	10(41%)
CE4 with no daughter cyst	0(0%)
CE5 with full wall calcification	0(0%)
Total	24(100%)

**Table 3:** The WHO grading of the cyst

## DISCUSSION

Laparoscopic surgeries are very much prevalent in the whole world as they provide patients with multiple advantages as compared to old form of surgeries. Not only it provides cosmetic advantages but also helps them get rid of issues like pain after operation. So, there are multiple advantages of laparoscopic surgeries already known [11]. The improvement in the skills of surgeons and the recent advances in the field of technology has enabled scientists to multiply the skills of old and conventional hydatid form of cyst surgery by making use of laparoscopic principles. One problem that surgeons face while undergoing the conventional sort of surgery is that there is spillage of cysts content that ultimately leads to inflammation and infection in the abdomen. Later on, problems like concomitant anaphylaxis makes it difficult for patient to recover [12,13]. There are many articles that has studies where it is proved that the use of laparoscopic surgery has improved the older ways of operation for doctors and patient faced no anaphylaxis and spillage of cyst content in this case. In the present study there were 24 patients taken 23 of them had undertaken partial peri cystectomy by using laparoscopic method. But one of the participating patients had to face severe bleeding as his cyst was very close to the hepatic vein [14]. That's why there was need to shift to open surgery method for that patient. The rate of conversion was almost same as found according to studies carried out by Shrestha et al., where the team reported that there were 8% patients converted due to hemorrhage. But the conversion of one patient towards open surgery didn't make this one a failure. As the safety of the participating patients was the most important thing that's why they were shifted to open surgery method [15,16]. The mean age of the patients in the study was 34 which was same as the average age taken by other studies as well. However, there were more female patients included in our study which were just according to another study. However, it was seen that many studies had

either male or female dominance [17]. The mean time of operating the surgery was quite high in our study it was 81 minutes as compared to another study [13] and Gurusamy (53 minutes) and Shresta et al. [15] (40 minutes). Our surgery timing was more than others because the time was calculated from the time the patient was given anesthesia and also because the learning curve was decreasing slowly as the surgery was progressed. There were some studies that had their operating time near 117, minutes as shown in Li et al., [18]. After surgeries it was found that among all patients 7 had minor problems like 4 of them had some superficial port inflammation and 3 of them had to face bilious drainage from the drain of peri cysts. But all of these 7 patients recovered from these complications shortly after few days of procedure. One of the patients faced Clavein - Dindo problems of 1 and 2 grades that required some sort of intervention. One of the patients was found suffering from persistent bile in the drain of peri cysts region even after two weeks of the Clavein- Dindo complication [19,20]. There was recurrence of the cyst in almost 5% of the participating patients. The rate of recurrence in other studies ranged from 0-10% in the patients. However, the total recurrence rate was found to be 2% after laparoscopic treatment. Despite all these efforts acute kidney inflammation was observed in one of the patients. The cause of this complication was not identified however, it was seen that the parasitic nephropathy mediated by immune system even without any attack by parasite on the kidney took place which was unexplained sort of kidney injury [21]. According to a study carried out by Kumar et al., the cause of acute kidney injury was iodine toxicity during the procedure in case of hydatid cyst cavity. As there was no testing available that can prove the iodine level of the serum the study could not prove that the risk of these complications is due to iodine level while installing the iodine povidone in the surgery. However, it was found that the kidney functioning of the patient became improved after 16 cycles of dialysis in the health care unit [22].

## CONCLUSION

The study showed that the laparoscopic treatment can be done for hepatic CE as it is possible even if there are limited recourses. The rate of conversion of the patient from this surgery to the old conventional procedure is low, the recurrence rate is low and the post-operative complications are very much less than the conventional therapies. It is safer, cheaper and effective treatment for the patients suffering from hepatic CE.

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