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Original Article

FEASIBILITY OF LAPAROSCOPIC CHOLECYSTECTOMY IN ACUTE CHOLECYSTITIS WITH OR WITHOUT COMPLICATIONS AFTER 72 HOURS OF ONSET OF SYMPTOMS: OUR EXPERIENCE IN A SUB-URBAN TERTIARY HOSPITAL

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Laparoscopic Cholecystectomy, Acute cholecystitis, Laparoscopic cholecystectomy in acute cholecystitis beyond 72 hours of symptom onset, late laparoscopic cholecystectomy.

Abstract:

Introduction: *Acute cholecystitis has become a fairly common disease in this modern era due to overblown culture of first food chain shops in Bangladesh in the last decade or two. Laparoscopic cholecystectomy is the gold standard treatment of such cases. The traditional method was if 72 hours have elapsed from the onset of symptoms, either conservative treatment was provided or proceed to open cholecystectomy if conservative treatment failed. But now-a-days, due to advancement in the safety measures, instruments and expertise laparoscopic cholecystectomy is the treatment of choice. In our East West Medical College Hospital, we routinely go for laparoscopic cholecystectomy in such cases.*

Methodology: *This is an observational study done in East West Medical College Hospital from January 2022 to December 2024. Total of 355 patients were admitted for laparoscopic cholecystectomy; among them 132 cases with acute cholecystitis.*

Results: *During this study, 132 cases of acute cholecystitis were admitted and all of them underwent laparoscopic cholecystectomy. Among them 126 cases were completed laparoscopically despite per-operative difficulties. Only 6 cases needed conversion to open.*

Conclusion: *In experienced hand and with adequate expertise, in acute cholecystitis cases laparoscopic cholecystectomy is a safer option than conservative despite elapsing 72 hours of onset of presentation.*

Key Words: *Laparoscopic Cholecystectomy, Acute cholecystitis, Laparoscopic cholecystectomy in acute cholecystitis beyond 72 hours of symptom onset, late laparoscopic cholecystectomy.*

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Introduction:

Acute cholecystitis is the acute inflammation of the gallbladder and is mostly associated with gallstone formation, which is about 90-95% of the cases. Often, it causes severe abdominal pain, and if treatment is delayed or left untreated, potentially life-threatening conditions may arise. [1,2] Recurrent attacks of cholecystitis may lead to difficult anatomy, including mucosal atrophy of the gallbladder, thickening of the wall, scarring, and adhesion into the Calot's triangle.[3] Acute cholecystitis is conventionally treated with nothing per oral, intravenous fluids, intravenous antibiotics, and analgesics. After improvement, patients would be sent home with advice for cholecystectomy 6-8 weeks later.[1,4-8] If the conventional treatment doesn't show improvement, then open cholecystectomy is the option.[9] But this traditional operation would end up with larger incision, longer operative time and prolonged hospital stay and recovery time.[10] In the last few decades, with the enormous advancement of laparoscopic surgery and the build of experiences, laparoscopic cholecystectomy has become the choice of treatment in acute cholecystitis, especially when presented within the first 72 hours of the onset of

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symptoms.[10] It has several advantages over the open techniques like wider field of vision during surgery, less postoperative pain, rapid recovery time, cosmesis and early return to daily routine and workflow.[11] But laparoscopic cholecystectomy after 72 hours of onset of symptoms is quite challenging due to inflammatory adhesions, the chance of excessive intraoperative hemorrhage, the presence of complications, experience of laparoscopic surgery, and expertise in difficult cholecystectomy. [4-8] Regarding the feasibility of laparoscopic cholecystectomy in acute cholecystitis, many studies have shown that the success greatly depends on careful patient selection, time of intervention, and, vastly on the expertise of the surgeon.[12,13] In complications of acute cholecystitis like empyema, gangrene, and perforation, conversion to open procedure is sometimes necessary to adequately control the situation and prevent per operative complications. Delayed intervention increases the possibility of conversion to open procedure.[14-18]

In Bangladesh, the incidence of acute calculous cholecystitis has risen in the last decade or two, possibly due to an increase in unhealthy dietary habits, excessive fast-food consumption, and also partly due to an increase in the diagnostic facilities throughout the country. To date, laparoscopic cholecystectomy in acute cholecystitis is highly discouraged, especially when the 72 hours of onset of symptoms have elapsed. In our center, we have been practicing laparoscopic cholecystectomy in all the acute cholecystitis cases despite passing the '72-hour' mark. As a tertiary center, we find that, almost all the acute cholecystitis cases present to us after 72 hours have passed. In this study, we share our three years' experience dealing with the cases of acute cholecystitis laparoscopically passed the '72-hour' mark of onset of symptoms regarding per operative findings, difficulties and completion of the surgery laparoscopically.

Materials and methods

This is an observational study done in the department of surgery in East West Medical College Hospital from January 2022 to December 2024. A total of 355 patients underwent cholecystectomy in that duration, and among them, 132 cases were for acute cholecystitis and its complications. All the patients who were admitted with acute cholecystitis with or without complications of cholecystitis were included in this study. As a tertiary level hospital in a suburban area, we receive the patients after they have already passed the 72 hours of onset of symptoms due to delay in seeking help until the pain worsens, previously visiting and getting unprescribed medicines from pharmacies, visiting non-surgical consultants and receiving oral medications without proper direction, late arrival to our hospital, being referred from a distant hospital and investigative purpose. Patients admitted for elective cholecystectomy, patients with choledocholithiasis and with pancreatitis who needed cholecystectomy, were excluded from the study. Excluding those cases, we received a total of 132 patients with acute cholecystitis who already have passed the '72-hour' mark from the onset of symptoms as our sample size.

After receiving the patients with acute cholecystitis, we routinely proceed for laparoscopic cholecystectomy, and we start counselling our patients from the very beginning. We obtain detailed history, perform complete physical examination and maintain proper documentations. For all the patients, complete blood count, Blood glucose level, S. creatinine, S. alkaline phosphatase, Prothrombin time, ECG, Chest X-ray, and ultrasonography of the abdomen were done routinely. Since admission, the patients with acute cholecystitis were treated with nothing per oral and injectable medications, including cephalosporins.

We have a very expert surgical team comprising of 5 members, three of them already have more than 25 years of experience in the field of laparoscopy and remaining two surgeons have more than 6 years of experience. With proper counselling, consent and preparations, within 48 hours of admission, all the patients underwent laparoscopic cholecystectomy under general anesthesia with conventional four ports. In all the cases, pneumoperitoneum was created with carbon dioxide. A 5 mm or 10 mm 30-degree telescope was used. Conventional laparoscopic cholecystectomy instruments were used. The 'critical view of safety' was targeted to obtain preoperatively. For securing the cystic duct and cystic artery, either a metallic clip or vicryl suture material was used. For all the acute cholecystitis cases, despite bile or stone spillage, normal saline irrigation of the operative field was done routinely, and a right subhepatic drain was placed. The gallbladder was removed through the epigastric port. For large gallbladders, the epigastric port was extended laterally to avoid overstretching. For perforated gallbladders, empyema, gangrenous gallbladders, and spilled stones, an endobag was used to retrieve the gallbladder and/or stones. Ports were closed routinely with prolene 2-0. For extended epigastric ports, the rectus sheath was closed with vicryl 1-0. Patients were discharged on 2nd postoperative day after removing the drain. All the skin stitches were removed on the 7th POD.

For cases needing conversion to open cholecystectomy, the right subcostal incision was made, and a

conventional open technique was used, either retrograde or fundus-first method. For closure of the open wound, No. 1 polydiaxone suture was used with keeping a drain in Morrison's pouch. In the case of obese patients, an extra subcutaneous drain was placed. Drains were usually removed on the 5th to 7th postoperative day, and the patients were discharged. Stitches were removed after the 12th postoperative day.

All the cholecystectomy patients were followed up after 7 days and after one month of discharge from the hospital.

Table I shows that there is female predominance (68%) in acute cholecystitis with 68% of the cases while male is 32%. Highest incidence was observed in the 4th decade (39%) and second most was in 3rd decade (26%). In table II most prevalent diagnosis was acute calculous cholecystitis (43%), among them majority were female (39%). Second and third prevalent causes were empyema (22%) and mucocele (21%) of the gallbladder.

Table III shows per operative most prevalent difficulty was gallbladder adherent to the omentum (28%). Severe adhesion in the Calot's triangle was found in 21% cases.

Results

Table-I

Distribution of the patients according to demography.

	Male (%)	Female (%)	Total (%)
Age			
0 – 10	0 (0%)	1 (0.8%)	1 (0.8%)
11 – 20	0 (0%)	7 (5%)	7 (5%)
21 – 30	8 (6%)	26 (20%)	34 (26%)
31 – 40	18 (17%)	34 (26%)	52 (39%)
41 – 50	13 (10%)	15 (11%)	28 (21%)
51 – 60	2 (1.5%)	4 (3%)	6 (4.5%)
>60	1 (0.8%)	3 (2%)	4 (3%)
Total (%)	42 (32%)	90 (68%)	132(100%)

Table-II

Distribution of the patients according to diagnosis.

	Male (%)	Female (%)	Total (%)
Acute Calculous Cholecystitis	6 (4.5%)	51 (39%)	57 (43%)
Acute Acalculous Cholecystitis	1 (0.8%)	12 (9%)	13 (10%)
Mucocele of the Gallbladder	12 (9%)	15 (11%)	27 (21%)
Empyema of the Gallbladder	19 (14%)	10 (8%)	29 (22%)
Gangrene of the Gallbladder	4 (3%)	2 (1.5%)	6 (4.5%)
Total (%)	42 (32%)	90 (68%)	132 (100%)

Table-III

Distribution of case according to intraoperative difficulty / complications during laparoscopic cholecystectomy.

Difficulty / complication	Number of cases (%)
Gallbladder perforation and bile leakage	21 (16%)
Tearing of gallbladder wall and spillage of stones and bile	12 (9%)
Bleeding from the accessory cystic arteries or collateral vessels around the Calot's triangle	5 (4%)
Adhesion with omentum	37 (28%)
Duodenum drawn up towards the gallbladder	26 (20%)
Severe adhesion with duodenum	2 (1.5%)
Cholecystoduodenal fistula	1 (0.8%)
Severe adhesion in the Calot's triangle	28 (21%)
Dilated cystic duct which was not suitable for metallic clipping.	11 (8%)
Total (%)	132 (100%)

[Figure 1] Duodenum was found drawn up in 20% of the cases. In our study the conversion to open procedure from laparoscopic cholecystectomy in acute cholecystitis cases was only 4.5% as shown in table IV.

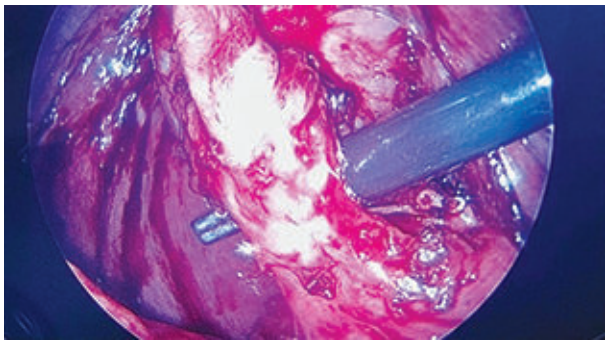

Figure 1: *Difficult Calot's triangle with short and wide cystic duct.*

Table V shows the causes of conversion to open procedure from laparoscopic cholecystectomy. Severe adhesion to duodenum and severe adhesion into the Calot's triangle were found in 2 cases each. There was one case where excessive bleeding from collaterals around the Calot's triangle and one case where there was cholecysto-duodenal fistula. Table 6 shows the average hospital stay was 3.5 days in laparoscopically completed procedure, whereas the average hospital stay was 7.5 days in conversion to open procedure in acute cholecystitis cases. Table 7 shows that the post-operative complications of laparoscopic cholecystectomy in acute cholecystitis were 9%, all of which were port site infections.

Table-IV

Distribution of cases according to conversion to open cholecystectomy.

Cholecystectomy completed laparoscopically	Cholecystectomy converted to open	total
126 (95.5%)	6 (4.5%)	132 (100%)

Table-V

Distribution of Laparoscopic cholecystectomy converted to open according to cause.

Cause for conversion to open	Numbers
Excessive bleeding from collaterals around the Calot's triangle couldn't be controlled laparoscopically	1
Severe adhesion to duodenum	2
Cholecystoduodenal fistula	1
Severe adhesion into the Calot's triangle	2

Table-VI

Distribution of cases according to hospital stay.

Laparoscopic Cholecystectomy in acute cholecystitis (average in days)	Conversion to open procedure in acute cholecystitis (average in days)
3.5 days	7.5 days

Table-VII

Distribution of cases according to post operative complications.

Post operative complications	Numbers (%)
No complications	120 (91%)
Port site infection	12 (9%)
Total (%)	132 (100%)

Discussion

In our study, all the cases that we received were beyond 72 hours of onset of symptoms of acute cholecystitis. There were multiple reasons behind this. Delay in seeking help until the pain worsened, previously visiting and getting unprescribed medicines from pharmacies, receiving self-medication without proper direction, late arrival to our hospital, being referred from a distant hospital, and investigative purpose from the patients' interest. Delayed arrival at the hospital while trying to manage from a local pharmacy or self-medication was the most frequent one. Also, patients not visiting the surgeon in the first place rather than the other specialty contributed to the delay. Even after arriving at the hospital, investigative procedures and sometimes patients' delaying in consent were routinely observed.

The surgeons who operated were experts in both laparoscopic surgery and dealing with difficult gallbladders. All the cases of acute cholecystitis underwent laparoscopic cholecystectomy despite late presentation beyond 72 hours of the onset of symptoms. We have found that most of the cases had acute calculous cholecystitis (43%) with female predominance (39%) which does coincide with some previous studies. [1, 19, 20]

Among the cases we observed adhesion of the gallbladder with the omentum in 28% cases and severe adhesion into the Calot's triangle in 21%, duodenum drawn up in 20% cases. During the maneuver, in 16% of the cases, the gallbladder became perforated and bile leaked, and in 9% of cases, the gallbladder was torn and stones spilled due to friable tissues. We observed 8% of the cases with dilated cystic duct, which was not suitable for clipping, intracorporeal suturing with 3-0 Vicryl was performed. Also, we observed excessive bleeding from accessory cystic arteries or collateral vessels around the Calot's triangle in 4% of cases. Despite all the difficulties during operation, only 4.5% of the cases were converted to open procedures, mostly due to difficult anatomy. Several studies recommended avoiding laparoscopic cholecystectomy in delayed presentation due to potential difficulties from severe inflammation.[13,21,22,23]

According to Rothman et al., the conversion rate was 1.8 to 27.7% through literature reviews.[24] It is 6% reported by Sippey et al. and 22.5% by Terho et al., mostly due to severe inflammation and difficulty in identification of anatomy.[25,26] Singh et al. reported a conversion rate of 0.42%.[27]

We observed 9% of cases with postoperative laparoscopic port site infection, which coincides with several other studies. [28-30] The port infection cases were treated with regular dressing and oral antibiotics.

Limitations

In our study, we were unable to compare the cases with a group that received laparoscopic intervention within the 72- hours of the onset of the symptoms. In some studies, arguments were made of using C-Reactive Protein (CRP) level as an indicator where the operation could be completed laparoscopically or not. We did not routinely measure CRP for cost effectiveness.

Conclusion

In our study we have found that laparoscopic cholecystectomy in acute cholecystitis beyond 72 hours of symptom onset is feasible as the surgical team was expert in laparoscopic surgery and had experience in difficult cholecystectomies. The conversion rate to open procedure was acceptable and also the post operative complication was minimal despite the delayed interventions.

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