

Any Time Laparoscopic Cholecystectomy in Moderate to Severe Acute Cholecystitis without Septic Shock

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Abstract Introduction: There is an ongoing debate over the timings of laparoscopic cholecystectomy in acute cholecystitis. Most authors recommend surgery within the first 72 hours. We offer laparoscopic cholecystectomies in every patient with acute cholecystitis regardless of the timing of presentation. Material and methods: We prospectively analyzed outcomes of our protocol of any time acute cholecystitis. We perform laparoscopic cholecystectomies within the first 24 hours of presentation to us without considering time since attack if the patient is not in septic shock where we follow survival sepsis guidelines. Results: We performed 110 laparoscopic cholecystectomies between April, 2019-March, 2020. We prefer single-dose preoperative antibiotics (third-generation cephalosporin) in all laparoscopic cholecystectomies. A total of 79 patients were having acute cholecystitis. 67 patients were having grade 2 and 12 patients were having grade 3 cholecystitis according to Tokyo guidelines. 50 patients were presented more than 72 hours after the attack. 21 patients presented more than 48 hours but less than 72 hours. 8 patients presented within 24 hours. The mean duration of the presentation was 120 hours. 5 patients presented after more than 7 days. One patient was having grade 3 cholecystitis and was having septic shock so he was managed with percutaneous cholecystostomy and according to survival sepsis, protocol and lap choly were done after 72 hours. Out of 79 patients included in the study, 2 patients were converted to open; in 3 patients we performed lap subtotal cholecystectomy due to difficult calot triangle. Out of these only 2 patients developed port site infection and 3 patients developed bilioma which was managed by percutaneous drainage. All patients were discharged the same day or the next day. Only two patients with bilioma were readmitted. Rest all of the patients had an uneventful recovery. Conclusion: There is no need to strictly follow the 72-hour time limit for laparoscopic cholecystectomy in acute cholecystitis. Any time laparoscopic cholecystectomy should be the rule inexperienced centre.

Keywords: laparoscopic cholecystectomy, acute cholecystitis, gall stone, sepsis, surgical site infection

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1. Introduction

Laparoscopic cholecystectomy for acute cholecystitis is the standard of care [1]. Previously it was believed that interval cholecystectomy should be standard of care in such cases, however, it has been proven by many authors that early cholecystectomy is beneficial in such cases [2,3,4,5]. However current standard practice recommends early cholecystectomy within 72 hours of presentation, in case of delayed presentation current literature supported delayed or interval cholecystectomy. In this prospective study, we have evaluated our protocol of any time cholecystectomy. We offer cholecystectomy to every case of acute cholecystitis regardless of the timing of presentation. We have evaluated conversion to open, septic complications, bilioma and bile duct injury in such patients.

2. Material and Methods

We performed 110 laparoscopic cholecystectomies between April, 2019 - March, 2020. We give a single pre-operative antibiotic to all patients who undergo laparoscopic cholecystectomy at our institute and no post-operative antibiotics. We used Tokyo guidelines 2018 to grade the severity of cholecystitis. All surgeries were done by a team of two surgeons. We perform laparoscopic cholecystectomies within the first 24 hours of presentation to us without considering time since attack if the patient is not in septic shock where we follow survival sepsis guidelines, do percutaneous cholecystostomy, and we do cholecystectomy preferably when shock recovers and risk-benefit ratio tilt towards surgery. Statistical analyses were done using SPSS version 21. (IBM). Ethical clearance was obtained from the hospital ethics committee.

3. Results

We prefer single-dose preoperative antibiotics (third-generation cephalosporin) in all laparoscopic cholecystectomies and no postoperative antibiotics. A total of 79 patients were having grade 2 or grade 3 cholecystitis. 67 patients were having grade 2 and 12 patients were having grade 3 cholecystitis. The mean ages of patients were 52 years. The median pre-operative ASA grade was 2. One patient was having grade 3 cholecystitis and was having septic shock so he was managed with percutaneous cholecystostomy and according to survival sepsis protocol. Lap cholecystectomy was done after 72 hours. Patients' characteristics are shown in [Table 1](#). Out of 79 patients included in the study 2 patients were converted to open which was having grade 3 cholecystitis, in 3 patients we performed laparoscopic subtotal cholecystectomy due to difficult calot triangle. Out of these only 2 patients developed port site infections with grade 3 cholecystitis and 3 patients developed bilioma which was managed by percutaneous drainage. One of them were grade 3 and one of their grade 2 cholecystitis [[Table 2](#)]. Morbidity was significantly associated with grade 3 cholecystitis according to Tokyo guidelines. ($p < 0.001$) [[Table 3](#)]. All patients were discharged the same day or the next day. Only three patients with bilioma were readmitted. Rest all of the patients had an uneventful recovery. The overall morbidity rate was 12.6 percent. We considered morbidity as any deviation in recovery or standard procedure in the case of laparoscopic cholecystectomy. Here we considered subtotal cholecystectomy also as a part of morbidity. There was no mortality in our study cohort. We always adhered to Tokyo guidelines to determine the grade of cholecystitis and did not consider intra operative difficulty in grading the severity of cholecystitis. The median time for symptoms of acute cholecystitis to laparoscopic cholecystectomy was 120 hours in our study. The median total hospital stay was around 3 days in our group.

Table 1. Patients characteristics

Characteristics	Patients
Age	Median age 52 years
Sex	51 females, 28 males
Median operative duration	60 minutes
Intra operative blood loss	80 ml
Median hospital stay	3 days
Mean ASA score	2

Table 2. Morbidity rates according to the grade of cholecystitis according to Tokyo guidelines.

Complications	Grade 2 Cholecystitis	Grade 3 Cholecystitis
Conversion to open		2
Subtotal cholecystectomy		3
Port side infection		2
Bilioma	1	2

Table 3. Chi-square test comparing grade of cholecystitis and complication (p value < 0.0001)

Complications	Grade 2 cholecystitis	Grade 3 cholecystitis
Yes	1	9
NO	66	3

4. Discussion

Laparoscopic cholecystectomy is a standard of care for acute cholecystitis [1]. While most of the authors agree about early cholecystectomy in such cases, precise timings are still debated. Most authors still prefer 72 hrs from the presentation as preferable timings for performing laparoscopic cholecystitis [2,3,4,5]. Ours is an experienced centre for laparoscopic surgery, and we by protocol perform any time laparoscopic cholecystectomy and offer laparoscopic cholecystectomy to every patient presented to us with acute cholecystitis.

Tokyo guidelines are an effective way to analyse the severity of cholecystitis. We had one patient of grade 3 acute cholecystitis according to Tokyo guidelines with septic shock as we did percutaneous cholecystostomy [6] in that patient and followed survival septic guideline for management [7] and did laparoscopic cholecystectomy as soon as septic shock recovered. Our centre being a tertiary referral centre we get most of the cases of acute cholecystitis and expected difficult cholecystectomies that explain a high number of acute cholecystitis cases compared to symptomatic cholelithiasis.

As seen in [Table 2](#) our overall morbidity rate was 12.6 percent and the mortality rate is 0 percent. The literature describes morbidity rates of around 5 to 20 percent and mortality rates of around 0.1 percent to 0.5 percent [8,9,10]. Here also an important thing to note is we considered subtotal cholecystectomy as a part of morbidity [[Table 1](#)].

Bile leak or bilioma happened in three patients who developed biloma however none required ercp and resolved on its own. None of them developed sepsis. Bilioma rate in our study was 3.7 percent. Walker et al showed bilioma rate of 2.7 percent but their cohort involved symptomatic as well as acute cholecystitis patients [11]. Two patients developed port side infections. All those patients were having grade 3 cholecystitis. So overall surgical site infection and infectious complication rates in our series is about 2.5% [12].

The conversion rate in our series was just 2.5 percent which is significantly low than the literature describes in the case of acute cholecystitis, which is 20-25 percent. The median hospital stay in our series was 3 days which is comparable and less than published literature and significantly less than open cholecystectomy [13,14,15]. There was no bleeding complication in our series and median blood loss was 70 ml and no blood transfusion was required in any of the patients. No patient had bowel injury in our cohort.

As shown in [Table 3](#) in our series morbidity was significantly associated with the grade of cholecystitis according to Tokyo guidelines. Johansson et al described laparoscopic cholecystectomy as a feasible option if operated within 7 days of presentation [14]. We did not have any criteria for timing in the case of laparoscopic cholecystectomy for acute cholecystitis. The median time of presentation to surgery in our cohort was 120 hrs. And highest time was 15 days since the start of symptoms.

One patient in which we had done percutaneous cholecystostomy due to septic shock we took the patient for laparoscopic cholecystectomy as soon as shock recovered and the patient had an uneventful course in case

of laparoscopic cholecystectomy. There are certain limitations to the study as it is not a randomised control trial. Biases related to the prospective study will remain in this cohort. This study still have a limited number of patients may be further randomized control trial with larger numbers are needed.

In conclusion, any time laparoscopic cholecystectomy is a feasible and safe option in case of acute cholecystitis in experienced centres without increasing morbidity and is beneficial to patients.

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