

## Laparoscopic cholecystectomy for acute cholecystitis, when to do?

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**Abstract:** Acute cholecystitis (AC) is common, the optimal time for surgery is still debatable. The aim of this study is to evaluate the outcome of early intervention within 1 to 3 days of onset of symptoms compared to those done after 3 days to 7 days, with reference to patients who were subjected to late procedure after 6 weeks. This retrospective study was done during the period from February 2013 to February 2015. 177 patients were included in this study. Patients were classified into two main groups 1 & 2; group 1 patients had undergone surgery while group 2 had been managed conservatively. **Group 1** included 105 patients for whom LC was done during the same admission were further subdivided into group A & B. **Group A** (65 patients) who were operated upon during 1 to 3 days of onset of symptoms i.e. Golden early LC (GELC) while the remaining 40 patients (**Group B**) were operated upon from 3 to 7 days of onset of symptoms (Silver late LC (SLLC)). **Group 2** (72 patients), who were treated conservatively and scheduled for late (interval) cholecystectomy after 6 weeks. We concluded that while performing laparoscopic cholecystectomy for acute cholecystitis during the early golden (1 to 3 days) is the best, still late early silver LC during 3 to 7 days of onset of symptoms (index admission LC) is feasible, cost effective with minimal morbidity.

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### 1. Introduction

Acute cholecystitis (AC) is a common complication of cholelithiasis that is frequently met by surgeons (1).

Despite extensive research, the optimal time for surgery is still debatable. Early laparoscopic cholecystectomy (ELC) within 72 hours was not found to be superior to elective one done after 6 weeks, with respect to outcome and cost of treatment (2).

ELC decreased morbidities, which might occur during the waiting period for elective cholecystectomy (3). However, ELC may not always be possible, patients may require correction of comorbidities before undergoing surgery. In addition, experienced laparoscopic surgeons may not be available within 24 h, as may be the case in quiet a number of primary care hospitals (4).

The aim of this study is to evaluate the outcome of early intervention within 1 to 3 days of onset of symptoms compared to those done after 3 days to 7 days, with reference to patients who were subjected to late procedure after 6 weeks.

### 2. Patients and methods

This retrospective study was done in our hospitals during the period from February 2013 to February 2015. 177 patients were included in this

study, with clinical, laboratory and radiological evidence of acute cholecystitis as outlined in the Tokyo guidelines with reference to age and gender.

Patients were classified into two main groups 1 & 2; group 1 patients had undergone surgery while group 2 had been managed conservatively.

**Group 1** included 105 patients for whom LC was done during the same admission regardless the onset of symptoms, these patients were further subdivided into group A & B.

**Group A** (65 patients) who were operated upon during 1 to 3 days of onset of symptoms i.e. Golden early LC (GELC) while the remaining 40 patients (**group B**) were operated upon from 3 to 7 days of onset of symptoms (Silver late LC (SLLC)).

**Group 2** (72 patients), who were treated conservatively with IV antibiotics and scheduled for late (interval) cholecystectomy after 6 weeks due to surgeon preference or the presence of comorbidity, like cardiac or pulmonary disorders which doesn't allow surgery during the same admission.

The operated groups were consented for LC procedures, which were carried out using four port incisions, with maximum pneumoperitoneum kept at 12 mmHg. Strasberg's "critical view of safety" (CVS) for dissection was achieved in all cases.

Perioperative data including patients demographics, duration of LC, conversion to open surgery, postoperative complications and the length of postoperative hospital stay. All data collected was analyzed using SPSS.

### 3. Results

This study involved 3 groups of patients, group 1 A & B and group 2. Group 1A included 65 patients

who were operated upon early within 1 day of onset of symptoms, while group 1B (40 patients), operated upon from 3 to 7 days of onset of symptoms i.e. late early.

Group 1 patients (105) were 24 males (11 in group 1A and 13 in group 1B) and 81 females (54 in group 1A and 27 in group 1B).

Table (1) shows group 1A & B patients characteristics

	Group 1 A(Golden early LC)	Group 1B(Silver late early LC)	Total
Number of patients	65 (61.9%)	40 (38.1%)	105
Gender MalesFemales	1154	1327	24 (22.9%)81 (77.1%)

The age ranged from 20- 60 years in-group 1, from 20 – 50 years in females and between 25- 60 years in males.

LC was attempted in all group 1 patients (105), the operative time was a little bit longer in group1B (60 minutes to 90 minutes compared to 50 -70 in group 1A) due to difficult dissection at triangle of Calot. No tube drains were put and non-was converted to open.

In-group 1, postoperative complications related to LC occurred in four patients (3.8%). Three cases (2.9%)in-group 1A (65 patients), two postoperative bleeding and one postoperative collection) and one case (0.9%) had collection in-group 1B (40 patients).

In-group1A, the complicated cases were due to bleeding in two cases and collection in one patient. Diagnostic laparoscopy was done for the two bleeding

cases, the source of bleeding was found to be from the liver bed in one case and from the umbilical port site in the other case. Hemostasis was achieved by diathermy coagulation for the liver bed in one case and stitches for the port site in the other case. The two cases were managed laparoscopically. No blood transfusion needed and tube drain was left for 24 hours. The hospital stay was 4- 5 days.

Two patients had postoperative collection, one case in group1A group and one in-group1B. Abdominal ultrasound was done and percutaneous aspiration was performed in the two cases, catheter was put for 48 hours in all. The hospital stay for the complicated cases was 4- 6 days for the group 1A case, while in-group 1B it was 5 days in one case and 7 days. Hospital stay for non-complicated cases varied from 2-3 days.

Table (2) Postoperative complications

	Group 1A	Group 1B	Total
Postop bleeding	2/65	None	2/105 (1.9%)
Postop Collection	1/65	1/40	2/105 (1.9%)
Total	3	1	4/105 (3.8%)

While group 1 patients were operated upon whether early or late early, group 2 patients (72) were managed conservatively & scheduled for delayed interval LC (DILC) i.e. after 6 weeks. 24/72 patients of group B were readmitted during the 6 weeks period due to different morbidities. 18 patients presented with biliary colic, managed conservatively in ER and discharged home while 5 patients developed recurrent acute attacks for which they were admitted to the hospital for 2-3 days for conservative management and rescheduled for DILC.

The worse morbidity in this group had been developed in 2 patients due to gall stone pancreatitis as proved clinically and by laboratory tests, both patients were readmitted and managed conservatively.

LC was done after clinical, laboratory improvements and exclusion of CBD stones by ultrasonography. The hospital stay for these 2 patients was as long as 8-10 days.

### 4. Discussion:

AC is a common diagnosis in the surgical practice, it was once considered a relative contraindication for LC at the beginning of the laparoscopic era, however this concept has been changed following huge expertise in laparoscopy(5).

Tokyo guidelines offer a staging system for AC based upon local as well as generalized inflammatory signs and imaging findings characteristic of acute

cholecystitis. It is helpful as diagnostic and therapeutic approach (6,7).

LC for AC was mainly performed after cooling down to avoid morbidity and conversion to open cholecystectomy. However, this delay exposes the patient to morbidities (1,2).

There is growing evidence in support of performing ELC; the timing varies from 24 to 7 days after the onset of symptoms or time of diagnosis according to research protocol. The so-called golden 72 hours cholecystectomy has been shown to be superior to that done after 6 weeks with regard to outcome and cost of treatment (8,9).

Immediate cholecystectomy within 24 hours of onset of symptom was proposed as standard procedure for AC. However, a division of the so called "golden 72 h" for the surgical into a more favorable "golden 24 h" and a less favorable "silver 25-72 h" could not find out any differences in surgical outcomes (10).

Delaying the operation for 6 weeks results in a plethora of unwanted consequences for both patient and hospital, ELC decreases morbidity that would otherwise occur during the waiting period for late procedure (10,11).

Our study focused on the evaluation of the outcome of surgical intervention within the same admission (index cholecystectomy) and its subdivision i.e., early golden LC (1 to 3 days) versus late early (silver) LC (3 to 7 days).

According to Zhu et al, gall bladder inflammation during the first 72 h of onset of symptoms may not involve structures within the triangle of Calot. Surgical dissection within this time frame reduces the risk of injury to the structures due to lack of organized adhesions, this is reflected in the low rates of complication and conversion rate (9).

In this study, there was no significant difference in terms of duration of surgery or the complication rate between both groups of golden early (1 to 3 days) and silver late early (3 to 7 days) hence we suggest performing LC for acute cholecystitis during index admission if there were no contraindications for surgery.

We had no conversion to open cholecystectomy in any of the cases done and we were able to achieve the "critical view of safety" in all cases with clear anatomy of the Calot's triangle, however the two cases of postoperative bleeding were managed immediately through laparoscopic approach, while the two cases of collection at the gall bladder bed were managed conservatively via C.T guided drainage.

In a multi-center randomized study by Gutt et al, immediate LC performed within 24 h of admission was shown to be superior to delayed LC done within 7-45 days, with regard to outcome. The authors concluded that immediate LC should become the

treatment of choice for operable patients with AC (12).

The absolute heterogeneity of patients and comorbidities make the subsequent therapeutic procedures very difficult to standardize (13).

Cholecystectomy however, may not always be possible within 24 hours of admission for many different reasons. In such cases; surgery should be performed within 72 hours (14).

Peter et al on the other hand found that immediate LC for AC within 24 hour of symptom onset is not superior to surgery 25-72 hour after symptoms begin. LC for must not be performed within 24 h of admission; the golden 72 h time frame however should be maintained where possible (15).

Yuichi et al., suggested that it is not necessary to perform LC for AC within 24 h following symptom onset, they could not prove any difference in outcome between the group managed within 24 h and that managed 24 - 72 h of onset of symptoms. LC for AC therefore can be safely performed anytime within the golden 72 h (4,15).

The definition of early LC varies from 0 through 10 days depending on the research protocol; the optimum time to perform early LC is still unclear (16).

In some series, early defines the begin of symptoms while the same term is used with regard to the time of admission in other series (17,18).

In this study, "early" was defined with respect to the onset of symptoms. We did not document any major difference in outcome of early L.C. done throughout the golden 72 hours, however the 24/72 (33.3%) patients who were discharged home, for interval LC after 6 weeks, came back with different gall stone-related morbidity.

## Conclusions

While performing laparoscopic cholecystectomy for acute cholecystitis during the early golden (1 to 3 days) is the best, still late early silver LC during 3 to 7 days of onset of symptoms (index admission LC) is feasible, cost effective with minimal morbidity.

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