



## EARLY LAPAROSCOPIC CHOLECYSTOECTOMY IS THE IDEAL MANAGEMENT OF ACUTE CHOLECYSTITIS.

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**ABSTRACT** Acute cholecystitis is a common condition encountered in surgical practice. It affects all age groups but it is more serious in elderly and diabetic patients. So early diagnosis and early surgical intervention has the advantages over delayed surgical intervention.

**Method** :From January 2011 to August 2016 I conducted a prospective study at Alkarama teaching hospital. I compared the two approaches to the treatment of acute cholecystitis. During this study 74 patients with acute cholecystitis to surgical department 35 patients were treated with early laparoscopic cholecystectomy within 24 to 72 hours from the appearance of symptoms while the remaining patients were treated with antibiotics and subsequently underwent delayed cholecystectomy after 6 weeks.

**Results**: Our results suggest several advantages of early laparoscopic cholecystectomy such as shorter operation time, lower conversion rate, shorter length of hospital stay, shorter postoperative convalescence and lower cost of hospitalisation.

**Conclusion**: Based on these results we believe that immediate laparoscopic cholecystectomy (within 24 to 72 hours from the patient's admission to hospital) should become a preferred method of treatment of patients with acute cholecystitis.

**KEYWORDS** : Early laparoscopic surgery for acute cholecystitis

### Introduction

Acute cholecystitis (AC) is a common diagnosis in the surgical practice with a clear indication for surgery. Although widely discussed in the past, unequivocal evidence exists supporting the superiority of early laparoscopic cholecystectomy within 24 to 72 hours over delayed LC with respect to outcome and cost of treatment [This trend was confirmed in a recently published randomized study in patients managed within 24 hours of admission [9]. 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 as recommended in several guidelines [The aim of this study was to compare the outcomes of patients undergoing LC within 24 to 72 h of symptom. Early cholecystectomy within 24 to 72 hours has shown to be superior to late or delayed cholecystectomy with regard to outcome and cost of treatment. Recently immediate cholecystectomy within 24 to 72 hours of symptoms was proposed as golden standard for the management of acute cholecystitis.

### Patients and methods

A retrospective review of the charts of patients undergoing cholecystectomy for AC from January 2011 to August 2016 in the department of surgery of an AlKarama teaching hospital was performed. Baseline characteristics including age, sex, body mass index (BMI) and medical comorbidities as defined by the American Society of Anesthesiology (ASA) were retrieved for each patient.

Acute cholecystitis was diagnosed as outlined in the Tokyo guidelines [13, 14]. The diagnosis was confirmed during surgery and following histopathology. Only patients managed within all surgeries in this study were performed by experienced attending surgeons. Laparoscopic cholecystectomy [15] was carried out using four incisions with pneumoperitoneum installed via a sub-umbilical mini-laparotomy with the maximum intraabdominal pressure kept at 12 mmHg.

The data collected was analyzed using the Statistical Package for Social Science (SPSS®), IBM, version 22. The study population was statistically described using absolute case numbers, percentages, medians and interquartile ranges. Significance was calculated using the Fisher's exact test with levels of significance set at  $p < 0.05$ .

Patients operated upon 24 to 72 h after symptom begin (study group) were matched with regard to baseline and clinical features (same gender, similar ages, disease severity, BMI, ASA and APACHE II Scores) as well as disease severity grade (as outlined in the Tokyo guidelines) with patients operated upon within 24 h following symptom begin (control group). Both groups were comparable with regard to demographic and clinical characteristics.

Primary endpoints included the duration of anesthesia, the duration of surgery and postoperative complications. Secondary endpoints included the length postoperative of hospital stay and hospital mortality.

### Results

Within the period of investigation 74 cases of AC were managed surgically. The distribution of study population is represented in Figure 1. Thirty-five patients were managed within 24-72 h following symptom begin (study group). Thirty-five patients with similar characteristics to those of the study group were selected from the 105 patients managed within 24 h of symptom begin, Table 1. The demographic characteristics of the study population are summarized in Table 2. Both groups were comparable in all cases.

Distribution of the study population. 35 Patients undergoing surgery complications and the length of postoperative 72 hours of symptom begin were included for analysis. All patients were placed on intravenous antibiotics upon admission which was continued after surgery. Perioperative data including the duration of anesthesia, the duration of surgery, 25-72 h following symptom begin were compared to 35 selected patients with similar demographic and clinical parameter from the groups managed within 24 h of symptom onset.

**Table 1 Patients with similar baseline and clinical characteristics were selected from the group managed within 24 h and matched with those managed 25-72 h**

Case number	Gender		Age/ yrs				BMI		Severity grade		APACHE II score	
	≤24 h	25-72 h	≤24 h	25-72 h	≤24 h	25-72 h	≤24 h	25-72 h	≤24 h	25-72 h	≤24 h	25-72 h
1	M	M	69	68	2	2	32.4	23.8	1	1	5	7
2	M	M	74	74	3	3	35.2	26.1	2	3	9	7
3	F	F	69	70	3	3	32.4	35.8	2	2	8	6
4	M	M	82	84	4	3	28.7	27.4	3	3	18	17
5	F	F	30	22	2	2	25.5	25.4	2	2	1	1
6	F	F	68	61	1	2	26.2	41.5	2	2	6	5
7	F	F	39	39	2	2	32.3	24.8	1	1	2	1
8	M	M	76	74	4	4	34.9	33.1	3	3	18	19
9	M	M	74	74	3	4	25.1	26.8	2	3	17	18
10	M	M	80	76	2	2	28.4	23.6	2	1	14	13
11	F	F	46	45	2	1	38.6	28.7	1	1	3	2
12	M	M	42	43	2	2	28.1	27.0	1	1	2	2
13	F	F	37	37	2	1	26.3	29.7	1	1	1	1
14	F	F	60	55	2	2	32.8	31.0	1	1	4	4
15	F	F	84	81	2	1	25.4	20.8	2	1	11	14

16	M	M	76	71	3	3	31.6	25.6	1	1	11	11
17	M	M	57	60	2	2	29.6	29.0	1	1	5	8
18	F	F	45	47	2	2	31.3	33.2	1	1	3	2
19	M	M	34	31	1	1	26.2	17.0	1	1	1	1
20	F	F	43	42	3	3	29.4	26.6	1	1	2	3
21	F	F	76	71	3	3	27.2	31.6	2	1	9	6
22	M	M	56	56	2	1	24.2	24.7	1	1	6	6
23	M	M	43	45	1	2	24.2	22.0	1	1	1	2
24	M	M	80	79	3	3	16.2	19.4	1	2	9	9
25	F	F	51	54	2	2	24.8	24.4	1	1	4	3
26	M	M	52	59	2	2	28.7	26.2	1	1	4	4
27	M	M	73	74	2	2	30.8	29.2	2	1	8	5
28	F	F	61	65	3	3	26.0	33.5	3	3	15	13
29	F	F	82	83	3	3	31.2	21.5	1	1	7	5
30	M	M	65	61	2	1	25.7	26.5	1	1	8	5
31	M	M	64	63	2	2	25.1	21.6	1	2	9	7
32	M	M	79	77	3	3	33.9	31.2	3	3	13	11
33	M	M	82	87	3	3	29.9	27.6	2	3	19	18
34	M	M	71	76	2	2	30.2	33.8	1	1	11	11
35	F	F	68	63	2	1	30.2	34.1	1	1	11	11

Both groups were comparable in terms of demographic and clinical parameters.

**Table 2 Summary of the baseline characteristics of the cohort**

Feature	≤24 h	25 - 72 h	P-value
Gender (F/M)	15/20	15/20	/
Median age (interquartil range)	68.0 (30.0)	63.0 (27.0)	0.32
Median BMI (interquartil range)	28.7 (5.9)	26.8 (6.8)	0.19
ASA			
	1-2	22	22
	3-4	13	13

Both groups were comparable with regard to demographic characteristics.

There was no significant difference in the duration of anesthesia, the duration of surgery and the length of postoperative hospital stay amongst both groups. Five cases (14.2%) were converted to open cholecystectomy in the group managed within 24 h, while 3 cases (8.6%) were converted in the group operated upon within 25-72 h of symptom onset. This difference was not statistically significant,  $p = 0.23$ .

Two complications, including one patient with pneumonia and one with wound infection, were recorded in the group operated upon within 24 hours (5.7%). Five complications, including three patients with bile leak, one patient with wound infection and one patient with acute renal failure, were recorded in the group managed between 25-72 h of symptom begin (14.2%). This difference was not statistically significant ( $p = 0.42$ ), Table 3. There was no mortality in both groups.

**Table 3 Summary of the perioperative data**

Parameters	≤24 h	25-72 h	P-value
Median duration of anaesthesiology (interquartile range)	120.0 (45.0) min	115.0 (35.0) min	0.82
Median duration of surgery (interquartile range)	70.0 (35.0) min	65.0 (30.0) min	0.23
Rate of complication	5.7%	14.2%	0.42
Median duration of postoperative stay (interquartile range)	7.0 (3.0) min	6.0 (2.0)	0.65

## Discussion

The optimal timing of surgery for patients with AC has been a topic of controversy in the past. Initially, patients were managed conservatively with the aim of "cooling down" the inflammation, and then perform cholecystectomy weeks later. The heterogeneity of patients suffering from AC and their medical co-morbidities it difficult

to standardize treatment [16]. Acute cholecystitis was once considered a relative contraindication for LC at the beginning of the laparoscopic era, mainly due to high rates of complications and conversion. This trend however changed following growing expertise in laparoscopy. Nowadays, laparoscopic cholecystectomy is the gold standard for the management of benign gallbladder disorders and belongs to one of the most commonly performed procedures in surgery [17, 18]. Current data suggest that early LC for acute cholecystitis is superior to late or delayed LC with regard to outcome and cost of treatment [2, 19].

The term „early“ is rather vaguely defined in the literature [20, 21]. 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. In this study, „early“ was defined with respect to symptom begin. Generally speaking, early cholecystectomy is performed within a time interval of 72 h, the so called golden 72 h [22]. The aim of this study was to compare the outcomes of patients with AC managed within 24 h of symptom begin to those of patients managed 25-72 h following symptom onset. Data of patients undergoing LC in a primary care hospital in Germany was retrospectively analyzed. Thirty-five patients with AC managed within 24 h were matched (similar baseline characteristics, comorbidities and disease severity) with 35 patients managed 25 - 72 h after symptom onset. All surgeries were performed laparoscopically by surgical attendings with expertise in laparoscopy.

Surgery for acute cholecystitis could be time critical. According to Zhu et. al., gallbladder inflammation during the first 72 h of onset of symptoms may not involve structures within the triangle of Calot [23]. Surgical dissection within this critical period therefore appears easiest due to lack of organized adhesions. Cholecystectomy within this time frame reduces the risk of injury to the structures within the triangle of Calot. This is reflected in the low rates of complication and conversation.

There was no significant difference amongst both groups with respect to the duration of anesthesia and the duration of surgery. Equally, there was no significant difference in the rates of conversion and morbidity between both groups. All cases of conversion were due to the inability to clearly identify the structures within the space of calot.

Interestingly, three cases of bile leak were recorded in the study group. These complications occurred in patients with severity grade III and histopathologic evidence of necrotizing cholecystitis.

We could not prove any difference in outcome between the group managed within 24 h and that managed 25 - 72 h of onset of symptoms. Our results therefore suggest that it is not necessary to perform LC for AC within 24 h following symptom onset.

Taken together, a division of the critical time frame, i.e. the so called "golden 72 h" for the surgical management of acute cholecystitis into a more favorable "golden 24 h" and a less favorable "silver 25-72 h" could not be justified in this series. This study is limited by the relatively small size of the cohorts and the retrospective study design. Since the study did not include consecutive patients, there might have been some degree of bias in the selection of the patients for the matching group. Therefore the trend shown in this study must be validated in prospective studies with larger case numbers.

should be performed with 72 hours. It is safe, convenient, short hospital stay with very little complications. The golden 72 h time frame however should be maintained where possible.

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