

# Outcomes of patients presenting with Cholecystitis in terms of Early vs Delayed Cholecystectomy

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<sup>1,2,3</sup> Conception of study

<sup>1,2</sup> Experimentation/Study conduction

<sup>1,2,3</sup> Analysis/Interpretation/Discussion

<sup>1,5,6</sup> Manuscript Writing

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## Article Processing

Received: 14/01/2021

Accepted: 07/09/2021

**Cite this Article:** Qaiser, M., Rehan, M., Siddique, K., Anwar, M.I., Khan, O.H., Rehan, K. Outcomes of patients presenting with Cholecystitis in terms of Early vs Delayed Cholecystectomy. *Journal of Rawalpindi Medical College*. 30 Sep. 2021; 25(3): 355-359. DOI: <https://doi.org/10.37939/jrhc.v25i3.1561>

**Conflict of Interest:** Nil

**Funding Source:** Nil

**Access Online:**



## Abstract

**Introduction:** Biliary tract diseases comprise the most frequently occurring pathology in the abdomen, among which cholelithiasis affects 10-15% of the population. Early laparoscopic cholecystectomy, performed within 72 hours 2) Interval laparoscopic cholecystectomy, performed within 72 hours to 6 weeks 3) Delayed laparoscopic cholecystectomy in which patients are treated with antibiotics and given date of surgery within 6-8 weeks according to international criteria.

**Objective:** To find out the variability between hot, urgent, and delayed laparoscopic cholecystectomy in terms of clinical complications and to find out the readmission rate, the persistence of symptoms, and the safety of the procedure.

**Materials and Methods:** This is a retrospective study carried out in the Surgical Unit II, Holy Family Hospital, Rawalpindi from January 2018 to March 2018. All adult male and female patients presenting with acute cholecystitis and pancreatitis were included in the study.

**Results:** Total number of patients included in our study is 82. Most of the patients were female 80.5% with a mean age of 44 years. Most of the patients were categorized under delayed laparoscopic cholecystectomy 93.9%, 6.1% underwent interval/urgent cholecystectomy, and 1.2% early/hot cholecystectomy. Diagnosis in the study showed acute cholecystitis in 79.3% of patients, pancreatitis in 7.3%, empyema /gangrene of gallbladder in 6.1% mucocele in 6.1%, and choledocholithiasis in 1.2% of patients. Hence we figured out that performing early cholecystectomy leads to lesser complications.

**Conclusion:** Early laparoscopic cholecystectomy was found out to be a safe and cost-effective procedure. There is an increased incidence of readmission and complications with delayed laparoscopic cholecystectomy.

**Keywords:** Cholelithiasis, Pancreatitis, Cholecystectomy.

## Introduction

Biliary tract diseases comprise the most frequently occurring pathology in the abdomen. Among which cholelithiasis affects 10-15% of the population. It is thrice as common in women than in men.<sup>1</sup> Among these 20-40% of the asymptomatic patients develop symptoms and 1-3% of these present with complications of the disease.<sup>2</sup>

In western countries, there is a trend of hot cholecystectomy according to NICE and BSG guidelines. According to these guidelines, it is performed within seven days or during the index admission.<sup>3</sup> According to another research, 1) Early laparoscopic cholecystectomy, performed within 72 hours 2) Interval laparoscopic cholecystectomy, performed within 72 hours to 6 weeks 3) Delayed laparoscopic cholecystectomy in which patients are treated with antibiotics and given date of surgery within 6-8 weeks according to international criteria.<sup>4</sup>

If we talk about complications, acute cholecystitis consists of 15-26%.<sup>2</sup> Almost 15-30% of patients, who were treated for acute cholecystitis conservatively presented again with biliary colic events 70%, obstructive jaundice 24%, and pancreatitis 6% and had to undergo emergency cholecystectomy.<sup>6</sup> According to previous researches acute pancreatitis risk increases considerably with gallstones and performing the surgery timely declines the risk of further attacks.<sup>5</sup>

In the case of delayed laparoscopic cholecystectomy it has been further observed that once acute inflammation turns into chronic inflammation, factors like vascular changes and fibrosis makes the surgery a lot more complicated.<sup>1</sup>

**Objectives:** To find out the variability between hot, urgent, and delayed laparoscopic cholecystectomy in terms of clinical complications such as recurrent cholecystitis, acute pancreatitis, obstructive jaundice, and empyema/Gangrene of gallbladder and to find out the readmission rate, the persistence of symptoms and safety of the procedure.

## Materials and Methods

This is a retrospective cross-sectional study carried out in the Surgical Unit-II, Holy Family Hospital, Rawalpindi from 1<sup>st</sup> January 2018 to 31<sup>st</sup> March 2018. The data was taken from record files and analyzed using SPSS version 22. All adult male and female patients presenting with acute cholecystitis and pancreatitis were included in the study.

All patients presenting with symptoms of acute cholecystitis and pancreatitis were included in the study. The diagnosis was confirmed based on history, examination, and ultrasound scan findings. Patient demographics, presentation, biochemical markers, all the findings were noted. All the patients who underwent laparoscopic cholecystectomy in the period and the ones booked for elective cholecystectomy were all included as well.

Lab reports including white cell count and liver function tests including bilirubin, ALT/AST, and ALP were included in the study. Further analysis was performed for the presence of gallstones on ultrasound scan, gallbladder thickness, any fluid collection, CBD dilatation. Patients were categorized in different diagnoses as acute cholecystitis, pancreatitis, cholangitis, empyema/gangrene. Any peri-operative complications were noted along with the length of stay in the hospital.

Patients who underwent laparoscopic cholecystectomy were divided into three groups according to NICE and BSG guidelines. 1) Hot laparoscopic cholecystectomy performed within 7 days, Urgent laparoscopic cholecystectomy performed within 14 days, and delayed laparoscopic cholecystectomy performed after 14 days of the first presentation of symptoms. All laparoscopic cholecystectomies were performed by a standard technique.

## Results

The total number of patients included in our study is 82. Most of the patients were female 80.5% and mean age of 44 years with a standard deviation of 13.8. A comparison between age groups and Hot laparoscopic cholecystectomy, urgent laparoscopic cholecystectomy and delayed laparoscopic cholecystectomy is shown in Table 1.

**Table 1: Distribution of patients by age (n=82)**

	Surgery			Total
	Hot LC (7days)	URGENT LC (14 days)	Delayed LC	
<b>Age</b>				
20 - 28	0	1	8	9
29 - 38	0	1	20	21
39 - 47	1	1	20	22
48 - 56	0	1	18	19
57 - 65	0	0	5	5
66 - 75	0	0	4	4
85+	0	0	2	2
<b>Total</b>	1	4	77	82

Most of the patients were categorized under delayed laparoscopic cholecystectomy 93.9%, 6.1% underwent interval/urgent cholecystectomy, and 1.2% had early/hot cholecystectomy which is shown in figure no. 3. Diagnosis in the study showed Acute cholecystitis in 79.3% of patients, pancreatitis in 7.3%, empyema/gangrene of gallbladder in 6.1% mucocele in 6.1%, and choledocholithiasis in 1.2% of patients showed in Figure 2. A correlation of diagnosis with the duration of symptoms was made its shown in Table 3.

The most common clinical symptom was right upper quadrant pain in 98.8% and epigastrium pain in 1.2% of patients, clinical jaundice was observed in 9.8%, vomiting in 56.1%, and fever in 8.5% of patients. Comorbidities were observed in 36.6% of patients out of which 22% of them presented with Hypertension, 4.9% with diabetes mellitus, 7.3% with both, 1.2% with Asthma, and 1.2% with Ischemic heart disease. The distribution of co-morbidities is shown in Figure 1:

Pathological reports showed most of the white cell count was 89% normal. Whereas mean serum bilirubin was 0.8 mg/dL, mean serum alkaline phosphatase was 240.5 U/L, mean alanine transferase was 36.7 U/L.

**Table 2: Distribution of gallstones and CBD dilatation**

	CBD dilatation		Total
	Yes	No	
Gallstones	multiple	8 65	73
	single	0 9	9
<b>Total</b>		8 74	82

According to ultrasound reports 82.9% of patients presented with gallstones and 17.1% presented with gallstones along with CBD dilatation. Out of gallstones 89% presented with multiple gallstones and 11% with single gallstones which is shown in Table 2. 6.1% showed pericholecystic fluid collection. Gallbladder thickness was observed normally in 59.8% of patients whereas 20.7% showed partially distended, 8.9% thickened and 8.9% contracted gallbladder. ERCP was performed in 1.2% of patients and 6.1% underwent MRCP.

82% of the patients who underwent cholecystectomy were known cases of gallstones, only 6.1% presented with a history of the first appearance of symptoms less than 2 weeks whereas 65.9% presented with a history of 3-54 weeks and 28% with a history of more than 54 weeks.

Intra operation complications were observed in 18.2% of patients, 14.6% showed adhesions, 2.4% underwent conversion, 1.2% showed inflammation whereas 81.7% showed no complication given in Table 4.

**Table 3: Distribution of duration of symptoms with the diagnosis**

Duration of symptoms	Diagnosis					Total
	Acute cholecystitis	Pancreatitis	Empyema/ Gangrene of GB	Choledocholithiasis	mucocele	
2 weeks	1	2	1	0	1	5
>2 weeks	64	4	4	1	4	77
<b>Total</b>	65	6	5	1	5	82

**Table 4: Distribution of intra-op complications**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Conversion	2	2.4	2.4
	Adhesions	12	14.6	17.1
	none	67	81.7	98.8
	inflammation	1	1.2	100.0
	Total	82	100.0	100.0

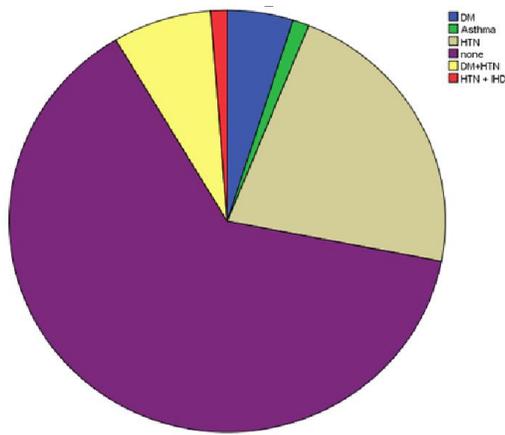


Figure 1: Co-morbidities

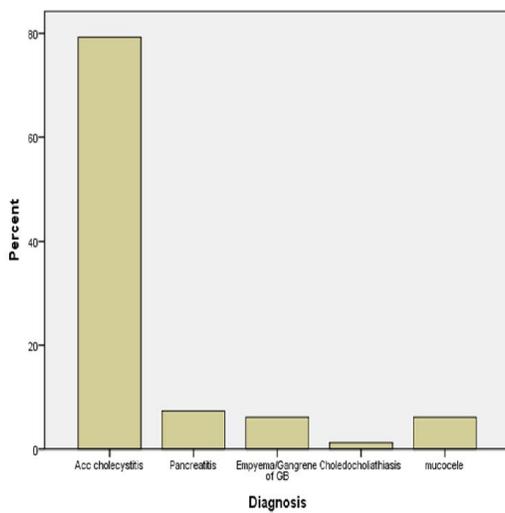


Figure 2: Diagnosis

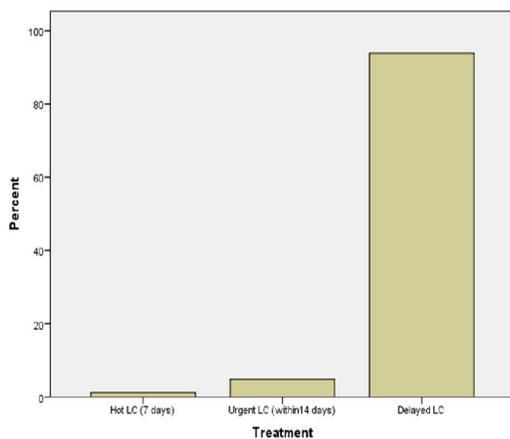


Figure 3: Treatment

## Discussion

Previously delayed cholecystectomy was considered preferable treatment because of the common misconception that per-operative complications along with difficulty in surgery procedure increase while performing early cholecystectomy until the inflammatory process completely subsides.<sup>7</sup> But according to recent NICE and BSG guidelines all the patients of acute cholecystitis should be provided early laparoscopic cholecystectomy.<sup>3</sup>

According to various researches done in the past few years early laparoscopic cholecystectomy is considered a more suitable option of treatment with a fewer incidence of clinical complications that occur throughout conservative treatment.<sup>4</sup>

The majority of the developed nations have reshaped their health systems with the latest recommendations but in third world countries like Pakistan, delayed laparoscopic cholecystectomy is still widely practiced due to lack of resources, hospitals, trained doctors, and equipment. Cultural stigma and lack of awareness also lead to the refusal of patients to appropriate treatment which plays a role in our hospitals.

The absence of surgical instruments and the accessibility of trained personnel in the handling of emergency patients is a vital issue. For that reason patients are unable to obtain an early date for the surgery, they are managed conservatively and sent back to wait for elective cholecystectomy. All of this leads to recurrence of symptoms and increased hospital stay observed with delayed laparoscopic cholecystectomy that is why early cholecystectomy is considered to be a more efficient, secure, and economical procedure.<sup>8</sup>

According to our research, the mean age of patients was 44 with a standard deviation of 13.8. In another research conducted in Italy, the mean age was found out to be  $54.9 \pm 13.2$ .<sup>2</sup>

Whereas in the United Kingdom, the average age was 43 years according to an article.<sup>9</sup>

And in another research conducted in Pakistan, the mean age was 53 years.<sup>10</sup> This can be explained by the fact that patients who are old, frail, and with multiple co-morbidities are recommended percutaneous cholecystostomy.

According to our research, 93.3% of patients underwent delayed laparoscopic cholecystectomy and 1.2% with early/hot cholecystectomy. In another research conducted in Italy, 35.2% were provided early LC (LC= laparoscopic cholecystectomy) and 59% delayed-interval LC.<sup>2</sup> A survey of Japanese surgeons

showed that 42% of patients with acute cholecystitis underwent an early LC.<sup>11</sup> A study conducted in the United States shows almost 20% of patients with acute cholecystitis were treated with an early operation.<sup>12</sup> In the UK 46% of patients underwent early laparoscopic surgery and 53.3% underwent delayed laparoscopic cholecystectomy.<sup>9</sup>

In our research 79.3% of patients presented with acute cholecystitis, 7.3% with pancreatitis, 6.1% with empyema/ gangrene of gallbladder, and 1.2% with choledocholithiasis.

In a study conducted in the UK, 1.33% of patients presented with pancreatitis, 1.33% with empyema of the gallbladder, 1.33% with gallbladder perforation, 2.7% acute cholecystitis, 2.7% with cholangitis 2.7% with obstructive jaundice, and 6.66% recurrent biliary colic.<sup>9</sup> In another research performed in Pakistan 38% presented with acute cholecystitis, 32% with biliary colic, 27% admissions with pancreatitis.<sup>10</sup>

It is the need of the hour that our health administration should put an effort to formulate a system where a separate facility should be available for patients who require hot/early laparoscopic cholecystectomy in order to avoid further complications, decrease readmission rate, and overall cost of the procedure. All departments involved including surgery, anesthesiology, and radiology must come forward and devise a system to overcome this predicament. It should also include particular projects, workshops, and sessions to coach the personnel in this field.<sup>13</sup>

## Conclusion

We found early laparoscopic cholecystectomy a safe, cost-effective procedure. There is an increased incidence of readmission and complications with delayed laparoscopic cholecystectomy. We suggest that measures must be taken in Pakistan to follow international guidelines in health practices to improve patient care.

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