

# Outcome of Early Versus Delayed Laparoscopic Cholecystectomy for Acute Cholecystitis

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## ABSTRACT

**Aim:** Compare morbidity and mortality in early and delayed laparoscopic cholecystectomy in two groups of acute cholecystitis.

**Methods:** This Quasi experimental study was carried out at Department of General Surgery Unit-IV of Jinnah Hospital, Lahore 6 months from June 2009 to November 2009. A total of 60 patients of acute cholecystitis were included between 20-65 years of age and were admitted through accident & emergency and out-patient departments. Patients were randomly allocated into two groups; group one underwent early laparoscopic cholecystectomy while the other had delayed surgery.

**Results:** The mean age in early group was  $37.73 \pm 8.77$  while in delayed group  $47.27 \pm 11.38$ . Female to male ratio was 4:1 in early group and 6.5:1 in delayed group. The main presenting feature was pain in right hypochondrium in both groups. Postoperative wound infection 1 (3%) and fever 2 (7%) were noted in early while in delayed group wound infection was 1 (3%) and fever 3 (10%).

**Conclusion:** We concluded that early laparoscopic cholecystectomy is a safe and effective method for treatment of acute cholecystitis. The results of early laparoscopic cholecystectomy are superior to delayed cholecystectomy in experienced hands.

**Keywords:** Acute cholecystitis, Early laparoscopic cholecystectomy, Delayed laparoscopic cholecystectomy.

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## INTRODUCTION

Gallstones are present in about 10% to 15% of the adult western population. Between 1-4% become symptomatic each year.<sup>1</sup> Laparoscopic cholecystectomy has rapidly become the "gold standard" in the treatment of uncomplicated symptomatic gallstone disease.<sup>2</sup>

Early laparoscopic cholecystectomy has been advocated for the management of acute cholecystitis, but little evidence exists to support the superiority of this approach over delayed interval operation. Lau and his colleagues have compared the outcomes and efficacy between early and delayed laparoscopic cholecystectomy for acute cholecystitis in an evidence-based approach using meta-analytical techniques. Early laparoscopic cholecystectomy reduced the total length of hospital stay and risk of readmissions attributable to recurrent acute cholecystitis, it is therefore a more cost-effective approach for management of acute cholecystitis.<sup>3</sup>

Although laparoscopic cholecystectomy is the preferred method of treatment for gallstones, there has never been consensus regarding timing of surgery in acute cholecystitis. Delayed cholecystectomy is offered 4-6 weeks later once acute symptoms are completely settled. With

advancement of expertise in laparoscopic surgery, early laparoscopic cholecystectomy which is performed within 5 days of onset of symptoms is becoming more popular as it is associated with decreased hospital stay, less complications and cost effectiveness<sup>4,5</sup>. Verma performed surgery within 72 hours of admission in his study<sup>6</sup>. It is believed that in early phase an edematous plane forms around the gall bladder that facilitates dissection. As time passes and the inflammation settles, adhesions become denser with scarring and contraction making dissection difficult. The presentation in our setup is different from the west that most cases are acute on chronic rather than presenting with first attack, adding to the degree of difficulty to operation.

The aim of this study is to compare the outcome of early versus delayed laparoscopic cholecystectomy in acute cholecystitis.

## PATIENTS AND METHODS

This Quasi experiment study was conducted in Surgical Unit-IV, Jinnah Hospital Lahore. A total of 60 patients of acute cholecystitis, between 20 to 65 years of age and of either sex were included in the study. Patients were diagnosed on the basis of history, clinical examination, laboratory investigations and ultrasonography findings. Patients with complications like gangrene and perforation were excluded from the study. After taking informed

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consent patients were randomly allocated to early or delayed groups. Patients in early group underwent laparoscopic cholecystectomy within 5 days. Delayed laparoscopic cholecystectomy patients were initially treated conservatively and observed for any complication during this period, followed by delayed surgery after 4 weeks and were discharged when comfortable. The patients were called for follow up after one and three weeks of the operation to evaluate for complications like fever, wound infection, bile duct injury, bile leakage, fistula and septicemia. All the data was entered in a proforma and was analyzed by SPSS version 17.

## RESULTS

This study included sixty patients of acute cholecystitis, out of these thirty patients underwent early laparoscopic cholecystectomy while other thirty patients were operated by delayed laparoscopic cholecystectomy. The age ranged from 20 to 65 years. The mean age of patients in early laparoscopic cholecystectomy was  $37.73 \pm 8.77$  years while in delayed laparoscopic cholecystectomy was  $47.27 \pm 11.38$ . In early laparoscopic cholecystectomy, there were 6 (20%) male and 24 (80%) were female patients, while in delayed laparoscopic cholecystectomy were 4 (13%) male and 26 (87%) were female patients in delayed laparoscopic cholecystectomy. Female to male ratio was 4:1 in early laparoscopic cholecystectomy and in delayed laparoscopic cholecystectomy ratio was 6.5:1. The main presenting feature was pain in right hypochondrium in both groups. The other most common presenting complaints were fever 9 (30%), jaundice 2 (7%), nausea/vomiting 19 (63%) in early group and delayed group presenting complaints were fever 20 (67%), jaundice 4 (13%), nausea/vomiting 6 (20%) (Table 1).

Time lag from onset of acute symptoms to operation in early group was  $4.53 \pm 1.00$ , while in delayed group was  $26.83 \pm 2.27$ . This difference was statistically significant ( $P < 0.05$ ) (Table 2). The duration of surgery (minutes) in early laparoscopic cholecystectomy was  $59.83 \pm 10.29$  and in delayed laparoscopic cholecystectomy was  $78.93 \pm 16.12$ . The difference was statistically significant ( $P < 0.05$ ).

The mean of total hospital stay in early laparoscopic cholecystectomy group was  $4.13 \pm 1.10$  days and in delayed laparoscopic cholecystectomy was  $7.03 \pm 1.23$  days. The difference in hospital stay between two groups was statistically significant ( $P < 0.05$ ) (Table 2).

Two patients (7%) had postoperative fever in early laparoscopic cholecystectomy and 3 patients (10%) in delayed laparoscopic cholecystectomy.

Wound infection occurred in 1 patient (3%) in early laparoscopic cholecystectomy while in delayed laparoscopic cholecystectomy wound infection was also noted in 1 patient (3%) (Table 3).

Table 1: Clinical features of patients in early versus delayed laparoscopic cholecystectomy (n=60)

Symptoms	Early Lap. Chole (n=30)	Delayed Lap Chole (n=30)
Fever	9 (30%)	20 (67%)
Jaundice	2 (7%)	4 (13%)
Nausea/Vomiting	19 (63%)	6 (20%)

P value  $< 0.05$

Table 2: Comparison of Time lag from onset of acute symptoms to operation, duration of surgery and total hospital stay of early and delayed groups (n=60)

Time Lag	Early Lap. Chole (n=30)	Delayed Lap. Chole (n=30)
Time lag	$4.53 \pm 1.00$	$26.83 \pm 2.27$
Duration of surgery (min.)	$59.83 \pm 10.29$	$78.93 \pm 16.12$
Hospital stay (days)	$4.13 \pm 1.10$	$7.03 \pm 1.23$

P value  $< 0.05$

Table 3: Complications of patients in early versus delayed laparoscopic cholecystectomy (n=60)

Complications	Early Lap. Chole (n=30)	Delayed Lap. Chole (n=30)
No complication	27 (90%)	26 (87%)
Fever	2 (7%)	3 (10%)
Wound infection	1 (3%)	1 (3%)

## DISCUSSION

Laparoscopic cholecystectomy is the gold standard treatment for most gallbladder diseases. Laparoscopic cholecystectomy is considered the most cost-effective management strategy in the treatment of symptomatic gallstones.<sup>7</sup> Conversion to open cholecystectomy is necessary in some patients for any of a number of factors. Identifying these factors will help not only the patient and the surgeon but also the hospital<sup>8</sup>.

Gallstones are more prevalent in females. The female to male ratio reported by Al-Salamah<sup>9</sup> was 4.5:1. In the present study, female to male ratio observed in early group was 4:1 while in delayed group was 6.5:1 which is comparable with Al-Salamah study.

A study was done by Al-Salamah<sup>9</sup> the mean age was 43.7 years. In another study reported by Cheema<sup>2</sup> age range of patients was 22 to 70 years with a mean age 41.4 years. In the present study the age ranged was 20 to 65 years with Mean  $\pm$  SD in early group was  $37.73 \pm 8.77$  while in delayed group was  $47.27 \pm 11.38$ . This is statistically significant ( $p < 0.05$ ). A study by Gourgoutis<sup>10</sup> showed the mean

operative time of 68 minutes in laparoscopic cholecystectomy. In study of Cheema<sup>2</sup> the operative time was 88 minutes in laparoscopic cholecystectomy. However in the present study operative time was  $59.83 \pm 10.29$  minutes in early group and  $78.93 \pm 16.12$  in delayed group ( $p$  value  $< 0.05$ ) which is comparable to above studies.

A study by Tsushimi<sup>11</sup> showed hospital stay of  $8.6 \pm 2.1$  versus  $15.6 \pm 6.3$  days ( $p < 0.01$ ) after laparoscopic cholecystectomy. In another study by Kolla<sup>12</sup> hospital stay was 4.1 vs 10.1 days in early and delayed groups respectively. Another study by Hassan<sup>13</sup> the mean hospital stay was  $1.2 \pm 1.1$  days for group A and  $1.7 \pm 2.1$  days for group B ( $P < 0.001$ ). Study done by Madan<sup>4</sup> the total hospital stay was 2.1 versus 5.4 days, ( $P < 0.004$ ) and postoperative hospitalization was 1.2 versus 3.9 days in early and delayed laparoscopic cholecystectomy respectively. In the present study hospital stay of early and delayed laparoscopic cholecystectomy is  $4.13 \pm 1.10$  and  $7.03 \pm 1.23$  ( $p < 0.05$ ) respectively which is comparable with the above mentioned studies. The postoperative hospitalization was  $1.07 \pm 0.25$  in early group and  $2.53 \pm 0.62$  days in delayed group which is also comparable and statistically significant ( $P < 0.001$ ). Early laparoscopic chole-cystectomy for acute cholecystitis is safe and feasible, offering the additional benefit of a shorter hospital stay and postoperative hospitalization.

A study of 45 patients of acute cholecystitis carried out by Ligouri<sup>14</sup> showed two cases of wound infection in patients of laparoscopic cholecystectomy. In another study done by Siddiqui<sup>15</sup> in laparoscopic cholecystectomy group there was only one case of wound infection i.e., 2%. In present study, wound infection rate was observed in 1 patient (3%) in early and in 1 patient (3%) in delayed group. An analysis of 4113 patients with acute cholecystitis by Banz reflected that delay in surgery led to increased post operative complications, higher conversion rates and longer hospital stay.<sup>16</sup>

The present study showed no conversion to open cholecystectomy and no mortality. It is due to proper operative work-up, sound surgical technique and performance of procedure by experienced surgeon. Postoperative fever was noted in 2 patients (7%) in early group and in 3 patients (10%) in delayed group. Other complications like bile duct injury, biliary fistula, sepsis and pulmonary complications were not seen in this study.

## CONCLUSION

Early laparoscopic cholecystectomy is a safe and effective method for treatment of symptomatic gallstones. In experienced hands, the results of early laparoscopic cholecystectomy are superior to delayed laparoscopic cholecystectomy in terms of shorter hospital stay and decreased postoperative hospitalization and complications.

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