ORIGINAL ARTICLE

Early vs Delayed Laparoscopic Cholecystectomy in Acute Cholecystitis

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ABSTRACT

Aim: To compare outcome of early vs delayed laparoscopic cholecystectomy in acute cholecystitis.
Design: It was a randomized controlled trial.
Place and duration of study: This study was conducted at the Department of Surgery Unit-I, Ghurki Trust Teaching Hospital, Lahore over 1 year period from March 2014 through June 2015.
Methods: This study involved 210 patients presenting at emergency department of Ghurki Trust Teaching Hospital, Lahore with acute cholecystitis. Patients with previous abdominal surgery, surgical jaundice, ultrasound-proven choledocholithiasis, acute gallstone-induced pancreatitis and those with significant comorbid conditions falling under ASA class ≥III were excluded from this study. These patients were randomly allocated into 2 treatment groups using lottery method. Group-A (30 cases) underwent early (48-72 hours of diagnosis) while Group-B (30 cases) underwent delayed laparoscopic cholecystectomy. Outcome measures included mean operative time, mean operative blood loss, mean VAS score for post-operative pain at 24 hours and frequency of bile duct injury.
Results: The age of the patients ranged from 37 years to 63 years with a mean of 51.13±8.05 years. There were 40(19%) male and 170 (81%) female patients in the study sample giving a male:female ratio of 1:4.26. There was no statistically significant difference between the two groups in terms of mean age (p=0.139) and gender (p=0.725). The mean operating time (112.25±10.16 vs. 154.94±7.83 minutes; p=0.000) and mean operative blood loss (26.50±4.44 vs. 75.72±6.82ml; p=0.000) were significantly lower in Group-I as compared to Group-II. However, the frequency of bile duct injury was significantly higher in Group-I (10.5% vs. 0%; p=0.001). While there was statistically insignificant difference between the two groups in terms of post-operative pain (2.98±0.96 vs. 2.43±0.85; p=0.668).
Conclusion: Early laparoscopic cholecystectomy was found to be associated with significantly shorter mean operating time and decreased mean operative blood loss but with significantly higher frequency of bile duct injury as compared to delayed laparoscopic cholecystectomy with acute cholecystitis.
Keywords: Acute Cholecystitis, Lap. Chole., Early Cholecystectomy, Delayed Cholecystectomy

INTRODUCTION

Biliary diseases are a major portion of digestive tract disorders. Gallstones affect 10-15% of the population in western countries. It is three times more common in women than men. Prevalence increases with advancing age from 4% in the third decade to as high as 27% in the seventh decade of life[1,2,3]. 1-2% asymptomatic patients become symptomatic each year and require surgery. An estimated 10-20% of adults have gallstones, and as many as one third of these people develop acute cholecystitis[2,3]. Cholecystectomy for acute cholecystitis or recurrent biliary colic is the most frequent major surgical procedure performed by general surgeons, comprising approximately 500,000 operations annually[3,4].

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Laparoscopic cholecystectomy is the treatment of choice in gallstone disease. Acute cholecystitis was once considered to be a relative contraindication to laparoscopic cholecystectomy because of friability of tissues[5,6]. But now studies have shown that when acute inflammation matures to chronic inflammation, there is neovascularity, fibrosis, and contraction which make laparoscopic cholecystectomy more difficult and potentially more dangerous.[4] Laparoscopic cholecystectomy is still a matter of controversy in acute cholecystitis[7]. However more and more studies are showing its advantages over delayed cholecystectomy[5-9]. This practice is believed to avoid readmissions and life-threatening complications[9,10,11].

However, the existing studies contained controversy about this proposed advantage of early laparoscopic cholecystectomy in terms of operative time, operative blood loss and post-operative pain and showed safety concern about the risk of iatrogenic bile duct injury[8,9,10,11].

PATIENTS AND METHODS

This was a randomized controlled trial conducted at the Department of Surgery Unit-I, Ghurki Trust Teaching Hospital, Lahore over 1 year period from March 2014 through June 2015.

This study involved patients presenting at outpatient and emergency department of Ghurki Trust Teaching Hospital, Lahore with right upper quadrant pain and tenderness for more than 6 hours with fever >100°F and total leukocyte count >10,000/mm^3. Diagnosis was confirmed on abdominal ultrasound showing presence of gall stones, distended gallbladder and gallbladder wall thickness of more than 3mm. Sample size of 210 cases (105 each) was calculated using 95% confidence level and 80% power of test taking an expected mean blood loss in early laparoscopic group as 27±59ml and 79+142ml in delayed group[10].

Patients with previous abdominal surgery, surgical jaundice (bilirubin level above 3.5 mg/dl), ultrasound-proven choledocholithiasis, acute gallstone-induced pancreatitis (serum amylase three times above normal) and those with significant comorbid conditions falling under ASA class ≥III were excluded from this study.

These patients were randomly allocated into 2 treatment groups using lottery method. Group-A (105 cases) underwent early (48-72 hours of diagnosis) while Group-B (105 cases) underwent delayed (conservative management followed by surgery 6-12 weeks after acute attack) laparoscopic cholecystectomy. Outcome measures included mean operative time, mean operative blood loss, mean VAS score for post-operative pain at 24 hours and frequency of bile duct injury. Blood loss was estimated by measuring the fluid in suction chamber pre- and postoperatively and subtracting the amount of irrigation used from it. This volume was added to volume of blood on gauze piece. Diagnosis of bile duct injury was made when there was intra-operative bile leak, presence of bile in subhepatic drain or post-operative jaundice (bilirubin>3mg/dl) measured at 2nd and 7th days after surgery. A written informed consent was obtained from every patient.

RESULTS

The age of the patients ranged from 37 years to 63 years with a mean of 51.13±8.05 years. The mean age of the patients was 50.30±8.46 years in Group-I and 51.95±7.58 years in Group-II, however, the difference was statistically insignificant (p=0.139). There were 40 (19%) male and 170 (81%) female patients in the study sample giving a male:female ratio of 1:4.26. There were 18.1% male and 81.9% female patients in Group-I and 20% male and 80% female patients in Group-II. However, the difference was again statistically insignificant (p=0.725). These findings have been summarized in Table 1. The mean operating time (112.25±10.16 vs. 154.94±7.83 minutes; p=0.000) and mean operative blood loss (26.50±4.44 vs. 75.72±6.82ml; p=0.000) were significantly lower in Group-I as compared to Group-II. However, the frequency of bile duct injury was significantly higher in Group-I (10.5% vs. 0%; p=0.001) as compared to Group-II. While there was statistically insignificant difference between the two groups in terms of post-operative pain (2.98±0.96 vs. 2.43±0.85; p=0.67).

Table 1: Baseline Characteristics of the Study Population

Characteristics	Overall	Early Cholecystectomy(n=105)	Delayed Cholecystectomy (n=105)	P value
Age (years)	51.13±8.05	50.30±8.46	51.95±7.58	0.139
• Male	40 (19.0%)	19 (18.1%)	21 (20.0%)	0.725
• Female	170 (81.0%)	86 (81.9%)	84 (80.0%)	

Independent sample t-test and chi-square test, Observed difference was statistically insignificant

Table 2: Perioperative Outcome Variables

Characteristics	Early Cholecystectomy (n=105)	Delayed Cholecystectomy (n=105)	P value
Mean operative time (minutes)	112.25±10.16	154.94±7.83	0.000*
Mean operative blood loss (ml)	26.50±4.44	75.72±6.82	0.000*
Bile duct injury	11 (10.5%)	0 (0.0%)	0.001*
Post-operative pain (VAS score)	2.98±0.96	2.43±0.85	0.668

Independent sample t-test, * Observed difference was statistically significant

DISCUSSION

In the present study, the age of the patients ranged from 37 years to 63 years with a mean of 51.13±8.05 years. A similar mean age of 50.96±17.05 years was observed by Agarwal et al. in 2015 in Indian patients with acute cholecystitis[8]. Gutt et al. in 2013 observed mean age of 55.6±16.3 years among German such patients[4]. Gul et al[3] however reported quite lower mean age of 39.83±8.25 years in Indian such patients while Barcelo et al[4] in 2013 reported much

higher mean age of 67.36±15.74 years in Spanish population.

There were 40 (19%) male and 170 (81%) female patients in the study sample giving a male:female ratio of 1:4.26. A similar female predominance has been reported previously by Gul et al[3] in 2013 (1:4) and Gutt et al[4] in 2013 (1:1.69). Barcelo et al. however observed male predominance (1.54:1) among Spanish such patients[7]. These differences in age and gender can be attributable to population differences in the etiopathogenesis of cholecystitis.

The mean operating time (112.25±10.16 vs. 154.94±7.83 minutes; p=0.000) and mean operative blood loss (26.50±4.44 vs. 75.72±6.82ml; p=0.000) were significantly lower with early cholecystectomy as compared to delayed cholecystectomy. Ohta et al. (2012)[10] reported similar difference in mean operation time (120±50 minutes vs. 150±52 minutes; p<0.01) and mean operative blood loss (27±59 ml vs. 79±142 ml; p<0.01). However, in a recent randomized controlled trial Özkardeş et al (2014) didn't observe any difference in terms of mean operation time (67.00 6±28.515 vs. 71.33±6 24.066; p=0.202)[12]. Similar insignificant difference was also observed by Agarwal et al. in terms of mean operative time (p=0.80) and mean operative blood loss (p=0.42)[8]. This difference in observation among different researcher regarding operating time and blood loss can be due to the difference in the skills of operating surgeons as it is established that laparoscopic surgery has a steep learning curve[13].

The frequency of bile duct injury was however significantly higher in early (10.5% vs. 0%; p=0.001) versus delayed cholecystectomy group. Similar observation was made by Gul et al. (2013) who observed the frequency of bile duct injury to be higher in early cholecystectomy as compared to delayed cholecystectomy group (10.5% vs. 0%; p<0.05)[3]. No statistically significant difference was observed between the two groups in terms of post-operative pain (2.98±0.96 vs. 2.43±0.85; p=0.668) measured at 24 hours after surgery. Our observation is in line with that of Gul et al. who also observed similar insignificant difference (2.83±0.83 vs. 2.50±0.86; p=0.133)[3].

Thus the results of the present study were comparable with those of existing studies on the topic. Though early laparoscopic cholecystectomy was superior in terms of mean operative time and blood loss, yet it was associated with significantly increased frequency of iatrogenic bile duct injury which makes it a less ideal choice.

CONCLUSION

Though early laparoscopic cholecystectomy is associated with significantly shorter mean operating time (112.25±10.16 vs. 154.94±7.83 minutes; p=.000) and decreased mean operative blood loss (26.50±4.44 vs. 75.72±6.82ml; p=.000) but it is associated with significantly higher frequency of bile duct injury (10.5% vs. 0%; p=.001) as compared to delayed laparoscopic cholecystectomy in patients with acute cholecystitis. Thus early laparoscopic cholecystectomy should be avoided and delayed laparoscopic cholecystectomy shoulder be preferred whenever convenient.

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