

Early and late Biliary Complications of Laparoscopic Cholecystectomy in Acute Cholecystitis

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Abstract

Background: Laparoscopic cholecystectomy has become the standard of care for the elective management of cholelithiasis. Little information exists, however, regarding the appropriateness of this procedure in the setting of acute symptomatology.

Objective: This study was designed to evaluate the outcome of laparoscopic cholecystectomy in acute and severe acute cholecystitis based on early and late biliary complications, their incidence and management, and conversion rates to open surgery.

Methods: A prospective study done between April 2007 and November 2010, in the department of general surgery, medical city teaching hospital, Baghdad. Includes patients with acute cholecystitis admitted for laparoscopic cholecystectomy; they were divided into two groups, (group 1) including patients with acute cholecystitis; (group 2)

including patients with severe acute cholecystitis.

Results: 306 patients were admitted for laparoscopic cholecystectomy, 71 (23.2%) of them with acute cholecystitis and was involved in this study; they were divided into two groups, (group 1) patients with acute cholecystitis 61(85.9%), (group 2) patients with severe acute cholecystitis 10 (14%); including gangrenous gallbladder 3(30%), and empyematous gallbladder 7(70%). Patients in group 2 were significantly older than in group 1. Female sex was more significant in group 1, while male sex was more significant in group 2. There was no procedure related mortality.

Conclusion: laparoscopic cholecystectomy for acute cholecystitis is safe and associated with a low morbidity, mortality, and a low conversion rate.

Keywords: Laparoscopy, biliary complications, acute cholecystitis

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Introduction

Acute cholecystitis (AC) was considered a contraindication to laparoscopic cholecystectomy (LC) ⁽¹⁾. With improvement in instruments and technique, the number of reports on laparoscopic cholecystectomy for acute cholecystitis has increased ^(2,3).

AC can be complicated by empyema, gangrene, or perforation. Both gangrenous and empyematous acute cholecystitis can be defined as severe acute cholecystitis (SAC), and it is present in up to 30% of patients admitted to hospital with acute cholecystitis. Furthermore, SAC has been reported to be associated with increased mortality (15–50%), especially in the elderly or critically ill patients ⁽⁴⁾. Higher conversion and morbidity rates have been reported when gangrenous cholecystitis or

empyema of the gallbladder were approached by laparoscopy ^(5,6). Biliary complications are reported in many studies. Although these complications are not as common as they were in the past, but is still a major source of morbidity associated with laparoscopic cholecystectomy ^(7,8,9,10).

This study was designed to evaluate the outcome of laparoscopic cholecystectomy in acute and severe acute cholecystitis based on early and late biliary complications, their incidence and management, and conversion rates to open surgery.

Method

A prospective study done between April 2007 and November 2010, in the department of general surgery, medical city teaching hospital, Baghdad. 306

patients were admitted for laparoscopic cholecystectomy, 71 (23.2%) of them were diagnosed as acute cholecystitis and was involved in this study; they were divided into two groups, (group 1) including patients with acute cholecystitis 61(85.9%); (group 2) including patients with severe acute cholecystitis 10 (14%). The diagnosis of AC was based on the following diagnostic criteria; acute upper abdominal pain with tenderness under the right costal margin, fever above 37.5⁰C and/or leukocytosis more than 10,000 / m³, and ultrasonographic evidence, (thickened or edematous gall bladder wall, presence of gall stones, ultrasonographic Murphy's sign, and pericholecystic fluid collection). Both gangrenous and empyematous acute cholecystitis was defined as SAC. In addition, the operative finding, and histopathologic examination confirmed the diagnosis of both groups. Cases in which clinical, biochemical, and radiological investigations suggested common bile duct stones, or malignancy or those unfit for general anesthesia were excluded from the study. Previous abdominal surgery was not considered a contraindication to LC. All patients received 2 doses of third generation, cephalosporin (1gm), and one dose of gentamycin (80mg) as prophylactic

antibiotic, then oral antibiotics including ciprofloxacin (500mg, twice/d) and Trimethoprim (500mg, 2 tab.twice/d) for 5 days.

Laparoscopic cholecystectomy was carried out by 3 ports technique in 46 (64.8%) patients, and 4 ports technique in 25 (35.2%) patients. Gall bladder was extracted through epigastric port. Drain was used for all patients, removed after 6-24 hours.

The patients were advised to come for follow up after 7 days, one month, and 3 months after discharge. A thorough history and physical examination, with particular attention to the operative site, presence of jaundice and abdominal distension were undertaken on every visit. Liver function test and abdominal ultrasound were carried out after one month.

The data collected were regarding demographic information, histological diagnosis, conversion rate, reason for conversion, early and late biliary complications including bile leak, common bile duct injury, retained common bile duct stone, and stricture. Statistical analysis was performed with Fisher's exact test, and independent t test using SPSS version 10. *P* value < 0.05 was considered statistically significant.

Results

A total of 71 patients (23.2%) had AC and were involved in this study; they were divided into two groups. (group 1) including patients with acute cholecystitis 61(85.9%), (group 2) including patients with severe acute cholecystitis 10(14%); gangrenous gallbladder 3(30%), and empyematous gallbladder 7(70%).

In group 1, There were 45 female (73.8%) and 16 (26.2%) male patients. Age range 16-66 years (mean 45.9 years ± 11.79), the commonest age group was between 31-40 years (figure 1).

In group 2, There were 3 female (30%) and 7 (70%) male patients. Age range 39-62 years (mean 51.7 years ± 7.21), the commonest age group was between 41-60 years.

The demographic and preoperative laboratory data for each group are compared in (Table 1). Patients in group 2 were significantly older than in group 1 (*P*<0.05). Female sex was more significant in group 1, while male sex was more significant in group 2 (*P*<0.05). On the other hand, there was no significant difference in laboratory findings between groups 1 and 2 (*P*>0.05).

The operative time for LC was 61.25±21.60 min in group 1, 82.20±26.70 min in group 2, with significant difference (*P*<0.05) (Table 2).

2 patients developed bile leak with subhepatic biliary collection, one patient (1.6%) in group 1, presented one month post-operatively complaining from

tachycardia, intermittent fever, and pallor. abdominal ultrasonography revealed subhepatic collection. Explorative laparotomy done, the collection was bile and was aspirated, the cystic duct was identified and it was leaking bile through a displaced clips. ligation of the cystic duct with non absorbable suture done, drain inserted and antibiotics given. While the second patient in group 2 (10%) (P<0.05), presented with sudden onset severe abdominal pain one week post-operatively,

diagnosed by abdominal ultrasonography as subhepatic collection, which was managed by laparoscopic tube drain insertion and antibiotics. None of the patients

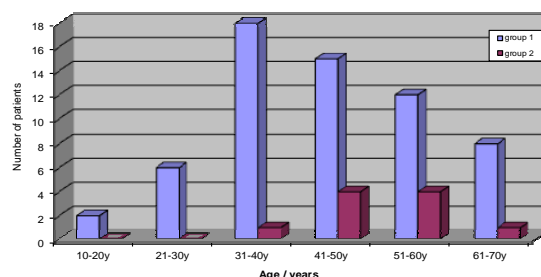


Figure 1: age distribution in both groups

Table 1: Clinical Characteristics of the two groups

	Group 1 (n=61)	Group 2 (n=10)	P value
Age	45.9 ± 11.79	51.7 ± 7.21	< 0.05
Sex (M/F)	16/45	7/3	< 0.05
Fever	37.5±0.5	37.5±0.8	NS
WBC count (/mm ³)	11,720±4,15	13,281±4,93	NS
Total bilirubin (mg/dl)	1.3±1.9	1.7±1.5	NS
AST (IU/l)	59.9±85.9	56.5±107.4	NS
ALT (IU/l)	61.5±104.6	60.4±101.1	NS

NS = not significant

Table2: Biliary complications, conversion rate, Operative time

	Group 1	Early	Late	Group 2	Early	Late	P value
Bile leak	1 (1.6%)	+	-	1 (10%)	+	-	< 0.05
Retained CBD stone	0 (0%)	-	-	0 (0%)	-	-	NS
CBD injury	0 (0%)	-	-	0 (0%)	-	-	NS
CBD stricture	0 (0%)	-	-	0 (0%)	-	-	NS
Conversion rate	3(4.9%)			1(10%)			< 0.05
Operative time	61.25±21.60 min			82.20±26.70 min			< 0.05

CBD: common bile duct, NS: not significant
 Early: within one month, Late: after one month

Discussion

Leakage of bile, bile duct injury, and retained bile duct calculi are the main biliary complications of laparoscopic cholecystectomy. They may occur separately, but complex biliary complications such as bile duct injury combined with bile leakage may occur frequently. Although there is no accepted classification of biliary complications and no standard protocol for the management of them, the treatment modalities depend on the type, cause, location, and extent of complications^(11,12,13,14). Prat et al. suggested that endoscopic sphincterotomy was sufficient for the treatment of simple bile leakage without ductal injury, clip migration, and retained stones. They also recommended endoscopic stenting as a primary option in partial common bile duct strictures and surgery in both groups developed retained common bile duct stone, common bile duct injury or stricture (Table 2). Conversion rate was 3(4.9%) in group 1, while more significant in group 2 1(10%) (P<0.05). Difficult dissection at calot's triangle due to dense adhesions was the most common indication for conversion. There was no procedure related mortality. As a definite treatment of choice in major injuries, including complete transection and complex injury⁽¹³⁾. In our study there were only two cases of simple bile leakage which was managed successfully with drainage only without the need for endoscopic sphincterotomy. Gangrenous cholecystitis, the last stage of gallbladder inflammation, is a severe form of acute cholecystitis and is associated with significantly greater morbidity and mortality relative to other forms of acute cholecystitis, especially in elderly, immunocompromised or diabetic patients^(4,15). In our cases there was no mortality, patients in group 2 were older than the other cholecystitis group; Female sex was more significant in group 1, while male sex was more significant in group 2. Advanced age and Male sex was identified as a risk factor for more severe acute cholecystitis, but outcome for men after

laparoscopic cholecystectomy was not significantly different from that for women^(6,16). And this is comparable to the results of our study.

The rate of conversion to open surgery in cases of severe cholecystitis has been reported to be between 8.7% and 75%^(17,18). In many studies, the rate of complications in cases of severe cholecystitis, including severe complications such as bile duct injury or bleeding, is between 0% and 40%^(5,19,20,21) and early consideration of conversion to open cholecystectomy has been advocated by Cox et al.⁽²²⁾. although Merriam et al.⁽¹⁵⁾ reported a 65% success rate

with the laparoscopic approach: They contended that a swift conversion to an open cholecystectomy may be warranted if gangrenous cholecystitis is found. Recent studies showed that early laparoscopic cholecystectomy seems appropriate for acute gangrenous cholecystitis. Conversion to open cholecystectomy may be required in difficult cases with complications^(23,24). In the present study, the rate of conversion to open surgery in group 1 was 4.9%, and in group 2 was 10%, being lower than that of other reports. Moreover, although there were two cases of bile leakage, none of our patients sustained bile duct injury; the rate of complications was low without severe complications. This is probably due to the difference in patient selection as well as difference in practice and individual experience.

With experience, patience, careful dissection, and identification of vital structures, the surgeon can safely complete a LC for AC in almost all cases.

In this study, the operative time of group 1 was shorter than that of group 2. This might have been because of the fact that much operative time was spent in group 2 because of edematous, tense, and hypervascular tissue. However this finding is comparable to others⁽²⁵⁾.

Conclusion

Our data show that LC for AC is safe and associated with a low morbidity, mortality, and a low conversion rate.

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