

Outcome of laparoscopic cholecystectomy in acute and chronic cholecystitis

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ABSTRACT

Objectives: To evaluate and compare the outcome of laparoscopic cholecystectomy (LC) in acute and chronic cholecystitis in terms of complications, conversion rates, reason of conversion and hospital stay.

Methods: Between April 1999 and March 2004, we retrospectively evaluated all patients admitted for symptomatic gall bladder disease in the Department of General Surgery, Lahore General Hospital, Lahore, Pakistan. All patients who underwent LC for symptomatic cholelithiasis were included. They were classified as group A [having acute cholecystitis (AC)] and group B [with chronic cholecystitis (CC)] based on the operative findings and histological diagnosis.

Results: Out of 725 patients who underwent LC, 173

patients were included in group A and 552 patients in group B. Conversion rate was 6% for group A and 0.7% for group B ($p < 0.0001$). Two patients (0.3%) in group B, while one patient (0.5%) in group A sustained bile duct injury ($p > 0.05$). Two patients (1.1%) in group A and 4 patients (0.7%) in group B developed sub-hepatic bile collections ($p > 0.05$). The mean hospital stay was 1.2 ± 1.1 days for group A and 1.7 ± 2.1 days for group B ($p < 0.001$).

Conclusion: Laparoscopic cholecystectomy is a safe and effective procedure in almost all patients presenting with symptomatic cholelithiasis.

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Cholecystectomy is one of the most commonly performed elective general surgical operations.¹ Laparoscopic cholecystectomy (LC) has become the first line surgical treatment of symptomatic gall bladder disease and the benefits over open cholecystectomy (OC) are well known.² The procedure, however, remains controversial for the management of acute cholecystitis (AC). It is considered to be associated with more complications and an increased risk of bile duct injuries (BDI).³

Despite the initial reservations regarding feasibility and safety of this procedure in acute cholecystitis, LC is increasingly being successfully employed as the initial surgical approach in majority of these patients.

This is attributable to the increasing experience and improvements in the available equipments.⁴ Majority of the recent studies demonstrate the safety and feasibility of LC in the setting of acute cholecystitis.³⁻¹⁰

This study presents a 5 years experience of LC for both acute and chronic cholecystitis (CC). We aim to evaluate and compare the outcome of LC in cases of AC and CC in terms of complications, conversion rates, reason of conversion and hospital stay.

Methods. Between April 1999 and March 2004, a retrospective evaluation of all patients, admitted with symptomatic gall bladder disease in the Department

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of General Surgery, Lahore General Hospital Lahore, Pakistan was performed. The patients, who underwent LC for different affections of gall stone disease, were included in this study. Laparoscopic technique was routinely used for all the all patients of symptomatic cholelithiasis. They were classified as group A (having AC) and group B (having CC), based on the operative findings and histological confirmation. 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.

All the patients received 3 doses of prophylactic antibiotic (Cefuroxime sodium, 750 mg), commencing at induction of anesthesia, until and unless indicated for prolong period. Laparoscopic cholecystectomy was carried out by 3 ports technique. The fourth port was used selectively in difficult cases. Gall bladder was extracted through umbilical port. The drain was used selectively depending on operative findings. A facial defect of 10 mm umbilical port was routinely repaired with Polypropylene No. 1 suture (Prolene®, Ethicon).

All the patients were discharged when they started tolerating oral diet, pain free, fully mobile and afebrile. They were advised to come for follow up after 7 days, one month and then 6 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. Investigations like liver function tests (LFT), abdomen ultrasound were carried out where indicated.

The data collected were regarding demographic information, histological diagnosis, conversion rate, reason for conversion, hospital stay, early (hemorrhage, wound infection, iatrogenic injuries) and late complications (biliary stricture, incisional hernia). The data were analyzed using the Statistical Package for Social Sciences software (version 11). Categorical data comparison was made by Chi-square and Fischer exact tests. Numerical (continuous) variable comparison was made by student T test. A *p*-value <0.05 was considered statistically significant.

Results. A total of 782 patients were admitted with symptomatic cholelithiasis over the study period. Seven hundred and twenty-five patients who underwent LC qualified for the study. Out of 725 patients, 173 patients (24%) had AC (group A) while 552 patients (76%) had CC (group B). In group A there were 142 female (82%) and 31 male patients (18%). Thirty patients (17%) had complicated disease (empyema gall bladder in 23 (13%) and gangrenous

gall bladder in 7(4%) cases). Group B was comprised of 490 female (89%) and 62 male patients (11%). Age ranged between 23-75 years (mean, 46.5 ± 9.1 years) for group A and 18-70 years (mean, 45.2 ± 8.1 years) for group B patients. Conversion rate was 6% for group A and 0.7% for group B (*p*<0.0001). Difficult dissection at Calot's triangle due to dense adhesions was the most common indication of conversion (72% for group A and 50% for group B). The detail of other causes of conversion is outlined in **Table 1**.

Two patients (0.3%) in group B, sustained bile duct injuries. In one patient, pinhole perforation in common hepatic duct was primarily repaired with polyglycolic acid (Vicryl, Ethicon®) 3/0 laparoscopically. Second patient developed a sub-hepatic biliary collection, which was managed by percutaneous catheter drainage, under ultrasound guidance and antibiotics. After 3 months, she presented with obstructed jaundice and diagnosed to have stricture CBD on investigations. Roux-en-Y hepatico-jejunostomy was carried out with uneventful recovery. In group A, BDI was noticed in one patient (0.5%), who underwent lateral choledochorrhaphy with T-tube drainage for partial injury of CBD after 36 hours of initial surgery.

Table 1 - Reasons for conversion.

Reasons	Group A	Group B
Difficult dissection and obscured anatomy	8	2
Bleeding from cystic artery	1	-
Transected accessory hepatic duct	-	1
Bile duct injury	1	1
Duodenal injury	1	-
Total	11	4

Table 2 - Morbidity of laparoscopic cholecystectomy.

Complications	Group A N=173 (%)	Group B N=552 (%)	P-value
Sub-umbilical wound infection	3 (1.7)	7 (1.2)	NS
Prolonged ileus	2 (1.1)	5 (0.9)	NS
Sub-hepatic bile collections	2 (1.1)	4 (0.7)	NS
Bile duct injury	1 (0.5)	2 (0.3)	NS
Transected accessory hepatic duct	-	1 (0.1)	-
Duodenal injury	1 (0.5)	-	-
Incisional hernia	1 (0.5)	-	NS
Total	10 (5.7)	19 (3.4)	NS
NS - not significant			

Duodenal injury was detected in one patient in group A after 24 hours when bile stained intestinal contents started coming out from the drain. The patient underwent laparotomy, and primary repair of the small perforation (1 × 1 cm) present on the second part of duodenum was performed. Postoperative recovery was smooth. Two patients (1.1%) in group A and 4 patients (0.7%) in group B developed sub-hepatic bile collections. None of them required open drainage. They were all managed successfully by ultrasound guided aspirations and antibiotics. These cases were followed up for 12-18 months (mean 14 months) by clinical evaluation, LFT and abdomen ultrasound but no evidence of BDI was detected. Other complications are summarized in **Table 2**. There was no procedure-related mortality in either group. The hospital stay ranged from 1.5-8 days (mean, 1.2 ± 1.1 days) for group A and from 1-9 days (mean, 1.7 ± 1.2 days) for group B ($p < 0.001$).

Discussion. Ever since its introduction in the late 1980s, laparoscopic cholecystectomy has rapidly gained acceptance as the “gold standard” treatment for symptomatic gall bladder disease.¹¹ The application of laparoscopic technique in AC remains controversial.^{3,8} Initially, AC was considered as a contraindication for LC owed to the fear of having high risk of CBD injury, due to edematous and inflamed tissue obscuring the anatomy in Calot’s triangle. However, with growing experience, attempts have been made to treat AC with laparoscopic surgery.⁵ Majority of the recent studies favor early elective LC in AC as it significantly reduces the hospital stay and charges.^{4,10}

It is well recognized, however, that in AC there is an increased rate of conversion to open procedure when compared to CC.¹⁰ In the present study, conversion rate was 0.7% in CC compared to 6% in AC ($p < 0.0001$). Conversion should not be regarded as failure or complication rather an attempt to avoid major life threatening complications. Early conversion shortens the operating time and decreases the morbidity.¹² There is a significant variation in the published conversion rates (0.7-32%).^{4,5,10-15} This is probably due to the difference in patient selection as well as difference in the institutional practice and individual experience. In our initial study, we reported a conversion rate of 12.7% in AC that is reduced to 6%, which reflects the learning curve effect.¹⁵ Kama et al¹² proposed a scoring system to identify high risk patients for conversion. These patients should know the possibility of conversion before hand and these cases should be allotted to experienced surgeons.¹²

The most debatable issue in LC is the fear of having BDI, which is an overwhelming emotional, as well as

financial and healthcare disaster. In the introductory period, the overall BDI rate after LC appeared higher than that of OC (0.3% versus 0.6%).¹⁶⁻¹⁹ However, with growing experience the difference in incidence of BDI during LC or OC is no more statistically significant.²⁰ Furthermore, AC is considered as a risk factor for BDI and the reported incidence varies from 0.2-2%.^{5,21} In the present series, statistically, there was no significant difference between the incidence of BDI in both the groups ($p > 0.05$). The incidence of 0.3% in cases of CC and 0.5% in cases of AC, is also comparable to other published figures.²¹⁻²³

Major retroperitoneal vessel injury during LC has been reported in 0.05% and bowel injury in 0.1-0.3% of the cases.^{5,10,14} In the present series, duodenal injury was detected in one patient of group A after 24 hours of initial surgery. We did not come across vascular injuries in both groups. Two patients (1.1%) in group A and 4 patients (0.7%) in group B developed sub-hepatic bile collections, who were managed by ultrasound guided aspirations and antibiotics. This is in accordance with the reported figure of 0.5-1.97%.^{8,10,14}

Three patients (1.7%) developed sub-umbilical wound infection in group A while it was noticed in 7 patients (1.2%) in group B. These figures are well within 1-5% reported in earlier studies.^{13,14} Use of umbilical port for the extraction of gallbladder may explain the high wound infection. One patient who had sub-umbilical wound infection presented with incisional hernia after 3 months which was repaired. The authors routinely repaired the fascial defect of 10 mm port with Polypropylene No 1 suture (Prolene®, Ethicon) as it is generally recommended by the majority of surgeons to prevent port site herniation.²⁴ There was no statistically significant difference in the overall postoperative morbidity in group A (5.7%) and group B (3.4%).

The total hospital stay after LC in group A was prolonged as compared to group B ($p < 0.001$). This is in accordance with results of other studies.^{10,13,14} Laparoscopic cholecystectomy is now performed as an outpatient procedure in selected patients. This procedure decreases the hospital cost significantly and is also acceptable to the majority of the patients.²⁵

In conclusion, LC is safe and feasible in almost all patients presenting with symptomatic gall bladder disease. Conversion rate and hospital stay after LC in cases of AC are higher than those in patients with CC, but statistically there is no significant difference in the complication of LC in either condition.

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