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Laparoscopic Cholecystectomy vs. Open Cholecystectomy in the Treatment of Acute Cholecystitis

(A Prospective study at a Northwestern Medical School in Bihar)

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Abstract

Objective: *To compare the results of laparoscopic cholecystectomy (LC) with those of open cholecystectomy (OC) in the treatment of acute cholecystitis.*

Design: *A prospective, nonrandomized trial.*

Setting: *Government medical college, Bettiah ,West Champaran*

Patients:*124 patients underwent LC, and 118 underwent OC. The patients underwent surgery within 48 hours of the onset of symptoms. The patients were selected for LC or OC depending on the patient's preference.*

Main Outcome Measures: *Operating time, Rate of conversion from LC to OC, complications, post operative pain, and length of hospital stay.*

Results: *Conversion from LC to OC was about in 12% of the patients. The mean operating time 82 minutes for the OC group and 102 minutes for the LC group (P<.001). Complications occurred in 14% of the patients in the LC group and in 23.7% of the patients in the OC group, with no significant differences between the 2 groups (P=.06). The number of moderate or severe complications was similar in both groups, whereas mild complications were more common in the OC group (P<.02). The use of parenteral analgesics in case of laparoscopic cholecystectomy (Mean no. of days=1.7) is considerably less than open cholecystectomy (Mean no. of days=3.7). The length of the hospital stay averaged 9.1 days for the OC group and 3.8 days for the LC group (P<.001).*

Conclusions: *Laparoscopic cholecystectomy is a safe, effective alternative to OC in patients with acute cholecystitis. The technique has a decreased rate of complications, a shorter hospital stay, and offers the patient a less uncomfortable postoperative period and also less pain.*

Introduction

LAPAROSCOPIC cholecystectomy (LC) has most certainly come up as an alternative to open cholecystectomy (OC) in the management of simple cholelithiasis.[1-3] However, the role of LC in the treatment of acute cholecystitis (AC) is somewhat controversial because some surgeons claim that the inflammation, edema, and necrosis

experienced by patients with AC make dissection more difficult, which can, therefore, increase the rate of complications.[4] Certain studies have recently found that LC is a safe, efficient technique for cases of AC.[5-7] However, these studies do not compare the results of LC with those of OC, which is the safest technique for managing AC. This study describes a series of patients with AC who were treated with LC or OC and analyses the results of both techniques.

Patients and Methods

Between January 2013 and March 2016, we conducted a nonrandomized, prospective study of 242 patients with AC: 124 patients underwent LC, and 118 underwent OC. The diagnosis of AC was established by clinical and laboratory findings, an Ultrasonography, intraoperative findings, or histopathological features revealing the presence of AC. Patients in whom choledocholithiasis was diagnosed preoperatively were excluded from the study. Age, sex, and operative findings are shown in Table 1. An antibiotic prophylaxis was given during the preoperative period and continued until 24 to 48 hours postoperatively. All the patients underwent surgery within 48 hours of the onset of symptoms. The surgical technique used for OCs in all patients was a subcostal incision with removal of adhesions plus cholecystectomy. The LCs was performed using standard techniques.[8] The following data were recorded: operating time; rate of conversion to OC in the LC group; postoperative complications and pain, and length of hospital stay. The statistical analysis used for comparison was the χ^2 test in an analysis of contingency tables and in a subsequent analysis of the residues. When the expected frequency was less than 3, we used the Fisher exact test.

Results

Cholecystectomy was performed in all of the patients. Conversion from LC to OC in 15 (12%) of the 124 patients: in 13 for inflammation or adhesions that created difficulty in dissection of the Calots triangle, and in 2 for bleeding of the cystic artery. Table-1 shows both group has maximum number of female patients. Age, Sex and Operative features have no significance in both groups. Table-2 shows the mean surgical time was 82 minutes for the OC group (range, 35-170 minutes) and 102 minutes for the LC group (range, 56-175 minutes), which was statistically significant (P<.001). In the LC group, 18 complications occurred in 18 (14.5%) of the patients. In the OC group, 29 complications occurred in 28 (23.7%) of the patients. A list of the type and number of complications in each group is provided Table- 5. In the LC group, these complications included 1 minor biliary fistula, which closed on the third postoperative day; 1 case of common hepatic duct stenosis caused by a burn from a coagulating hook, which required reoperation a month after the cholecystectomy; 1 case of bleeding of the hepatic bed, which required a blood transfusion; 1 intra-abdominal abscess, drained under ultrasound guidance; and 1 cases of choledocholithiasis 8 months after LC, which were resolved with ERCP. In the OC group, these complications included 2 cases of bleeding of the hepatic bed; and 2 cases of choledocholithiasis 10 months after the operation, which resolved with ERCP. Comparing the complications overall, we found a higher rate in the OC group than in the LC group, with no significant differences between groups (P=.06). Table-3 shows that pain in LC is less than OC. The use of parenteral analgesics in case of laparoscopic cholecystectomy (Mean no. of days=1.7) is considerably less than open cholecystectomy (Mean no. of days=3.7). Table-4 shows the mean length of the hospital stay was 9.1 days for the OC group (range, 4-20 days) and 3.8 days for the LC group (range, 1-12 days), with statistically significant differences (P<.001) between groups.

Table-1: Patient Data

Variable	Open Cholecystect	Laparoscopic Cholecystectomy	*P* Value
Total No of Patient	118	124	
Age, Y	48(22-88)	52(13-85)	.42
Sex ratio (M/F)	20:80	25:82	.16
Operative Features			
Inflammation	70	68	.36
Gangrene	30	34	.67
Empyema	18	22	.53

Table 2: Operating time (in minutes).

Nature of operation	operation time (Min)	Mean operation time (Min)
Laparoscopic cholecystectomy	56-175 min	102 min
Open cholecystectomy	35-170 min	82min

Table 3: Pain duration for both open and laparoscopic cholecystectomy groups are as follows

Nature of operation	pain duration in days	Pain duration in days (mean)
Laparoscopic cholecystectomy	1-4 days	1.7 days
Open cholecystectomy	2-8 days	3.7 days

Table 4: Hospital stay

Nature of operation	Days in Hospital	Range
Laparoscopic cholecystectomy	3.8	1-12 days
Open cholecystectomy	9.1	4-20 days

Table 5: Complications of open and laparoscopic surgery.

Complications	Open cholecystectomy	Laparoscopic cholecystectomy
Adynamic Ileus	9	3
Intra operative bleeding	2	1
Wound infection	4	2
Abdominal abscess	0	2
Bile duct fistula	0	1
Pancreatitis	1	0
Phlebitis	9	6
Chest infection	2	1
Choledocholithiasis	2	1
Bile duct injury	0	1

Discussion

Laparoscopic cholecystectomy is a safe and effective alternative in the management of uncomplicated biliary lithiasis. The pros and cons of this procedure are well documented for uncomplicated biliary lithiasis but not clearly defined for the treatment of AC. Our study included patients who were admitted to the emergency department for clinical, laboratory, and Ultrasonography features of AC; all the patients had signs of acute inflammation when LC was performed.

The operative time in our series was significantly longer in the LC group (*P*<.01). This is because, LC is more time consuming and technically demanding than OC in patients with AC.

The rate of conversion depends, on the one hand, on the surgeon's experience (in fact, most conversions occurred in each surgeon's initial patients) and, on the other hand, on the time when the patient undergoes surgery.[10] All the patients with AC in this series were operated on within 48 hours of the onset of symptoms because at this stage of the disease inflammation is not localized and it is easy to perform dissection of the structures. At a later stage, there is oedema, increased vascularity, and the formation of abscesses, factors that make dissection difficult. One factor to remember regarding conversion is that it must never be considered a complication but rather a sign of maturity on the part of the surgeon. Conversion rates of LC for elective surgery range from 3 to15 %. In our series the conversion rate is 12%.

The operation of choice for AC for many surgeons is OC because it has an acceptable morbidity and mortality rate.[11] Any alternative to this treatment must improve the results obtained with this technique. The incidence of complications in our series was greater with OC than with LC, although not significantly (*P*=.06). If we classify these complications according to severity, we see that mild complications, which usually occur in any postoperative period (e.g., phlebitis and adynamic ileus), were more frequent in patients who underwent OC than in those who underwent LC because the postoperative stay was significantly (*P*<.01) longer for these patients (9.1 vs. 3.8 days). Conversely, the amount of moderate or severe complications, usually related to surgical technique, was similar in both groups of patients.

J. A. Lujan et al [8], in a similar study as less hospitalization and low complication rates for LC. Eldar S et al[12] in a prospective study conclude that LC can be performed safely for acute cholecystitis with acceptably low conversion and complication rates. According to them different form of cholecystitis carry various conversion and complication rates in selected cases. LC for AC should be performed within 96 hours of onset of disease. Coccoloni et al[13] did a Systematic review and Meta analysis of ten trials in which total number of 1248 patients: 677 in the LC and 697 in the OC groups were included. They concluded that in AC , postoperative morbidity and mortality and hospital stay were reduced by LC. Moreover pneumonia and wound infection rate were reduced by LC. Severe hemorrhage and bile leakage rates were not influenced by technique. Cholecystectomy in AC should be attempted laparoscopically first.

We believe that LC is a safe, valid alternative to OC in patients with AC. The procedure has a low rate of complications, implies a shorter hospital stay, and offers the patient a more comfortable postoperative period than OC. The threshold for conversion to OC must be low so that the rate of complications is also low.

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