Effect of early laparoscopic Cholecystectomy in Acute Cholecystitis

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ABSTRACT

Background: Laparoscopic cholecystectomy (LC) has become the treatment of choice for elective cholecystectomy.

Objectives: To evaluate the safety and feasibility of early LC for AC and to compare the results with delayed LC.

Methods: A prospective study done from April 2011 to October 2013, 88 patients with diagnosis of AC were divided randomly into two groups according to the mode of treatment; (early group n=40) treated by early LC within first 72 hours or (delayed group, n=48) initial conservative treatment for 4-6 weeks, followed by delayed LC.

Results: There was no difference between the two groups (early & delayed LC), operating time (early 80min, delayed 70min), conversion rate (early 7.5%, delayed 6.25%), postoperative complications (early 20%, delayed 14.58%), However, the early group had shorter mean hospital stay (early 2.5 days, delay 5 days).

Conclusion: early laparoscopic cholecystectomy appears to be reliable, safe, and cost effective treatment modality for acute cholecystitis, offering the additional benefits of a shorter hospital stay.

Keywords: Acute cholecystitis, early LC, delayed LC.

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Most patients with gallstone (GS) remain symptom free for many years and may, in fact, never develop symptoms. However, the consequences of GS may be sever ranging from brief episodes of biliary pain to potentially life-threatening complications, such as acute infection of the gallbladder or pancreas. Until the last years, the prevailing surgical treatment of symptomatic GS was an open operation through an abdominal incision to remove the gallbladder [1], till the introduction of LC in 1980, when PhilipMouret from France performed the first human LC in 1987[2]. The operation usually requires general anesthesia and is subject to the same risks and complications as open cholecystectomy. However, patients have little pain after the operation; hospital stays and recovery are usually shorter than after open cholecystectomy[3].

LC has become the ideal operation for symptomatic gallstone all over the world, but in Iraq sill some surgeon practice open cholecystectomy as a routine operation for gall bladder stones in some hospitals, because of shortage of equipment and training centers.

The role of LC in AC is not yet established. In the developmental stages of LC, AC was considered a contraindication for the procedure, but with increasing experience in laparoscopic surgery, a number of centers have reported on the use of LC for AC, suggesting that it is technically feasible and safe.

Several randomized studies in the pre laparoscopic era had shown that early open cholecystectomy for AC was better than delayed open cholecystectomy in terms of shorter hospital stay, but both had similar operative mortality and morbidity [4]. Conversion from laparoscopy to laparotomy may be required in some case of LC in accordance with judgment of the surgeon. Conversion is usually necessitated by an inability to identify important anatomical structures in the region of gall bladder, such distorted anatomy may be the results of infection(acute inflammation or acute on chronic cholecystitis). Clearly, the appropriate surgical judgment is to convert before the complications occurs[5].

Early surgery for AC had since gained popularity in the late 1980s[2]. Successful LC during the period of acute inflammation is associated with an early recovery and shorter hospital stay. However, these advantages of early LC can be offset by the potential hazards of serious complications and a high conversion rate [6].

Theoretically, initial conservative treatment with antibiotics followed by interval elective cholecystectomy 4 to 6 weeks later, after acute inflammation has subsided, may result in a safer operation with less conversion rates[7].

The choice between the two methods of treatment is difficult because some surgeon claim that the inflammation, edema, and necrosis experienced in patients with AC make dissection more difficult, which can, therefore, increase the rate of complications. Certain studies have recently found that LC is safe, efficient technique for cases of AC[8].

The outcome of LC is influenced greatly by the training, experience, skill, and judgment of surgeon performing the procedure.

Method. A prospective study done between April 2011 and October 2013, 88 patients with diagnosis of AC admitted at department of surgery in AL- Yarmouk Teaching Hospital. The diagnosis of AC was based on a combination of clinical criteria (acute right upper quadrant tenderness, temperature exceeding 37.5 `C), white blood cell count greater than 10x10, Table1, and Ultrasonographic criteria (thickened, edematous distended GB; positive sonographic Murphy's sign; presence of gallstone; and pericholecystic fluid collection). Patients with coexisting common bile duct stones, biliary pancreatitis, upper abdominal surgery or

significant medical disease rendering unfit for laparoscopic surgery were excluded.

The patients underwent surgery after complete preoperative evaluation (hematological and biochemical analysis, chest radiography, and electrocardiogram when necessary) and ultrasonography. Intravenous fluids and Prophylactic antibiotic third generation cephalosporin(cefotaxime 1gm I.V injection every 12 hours) were giving during the preoperative period and continued until 24 to 48 hours postoperatively. Those patients who had jaundice or dilated common bile duct on ultrasonography underwent magnetic resonance cholangiopancreatograph (MRCP) were excluded from the study.

The following data were obtained: age, sex, symptoms, physical examination, operation time, conversion rate, complications, postoperative pain and hospital stay. Patients were then randomized into either the early group 40 patients (45.45%) or delayed group 48 patients (54.54%). In the early group, male patients were12(30%) and female patients were 28(70%) while in the delayed group, male patients were 15(31.25%) and female patients were 33(68.75%); the male to female ratio in the early group was 1:2.3 ,while in delayed group, the ratio was 1:2.2. In early group, the mean age was 42 years ranging (22-62 years) ,while in delayed group was 49 years ranging (28-70 years) In the early group, LC was performed within the first 72 hours, whereas in the delayed group, conservative treatment with intravenous fluids and antibiotics (cefatoxime 1gm every 12 hours) were given for 4 to 6 weeks and laparoscopic surgery was performed after the acute episode had subsided.

The surgery was done with patient under general anesthesia and endotracheal intubation. Pneumoperitoneum was created by blind puncture with a Veres needle through a sub umbilical incision. Four laparoscopic ports were used: two 10-mm ports (one umbilical for optical system and one epigastric port for the dissector/suction device) and two 5-mm ports (one at midclavicular line along the right sub costal margin and one in the right flank). Adhesion release and exposure of Calots triangle were first undertaken. The cystic pedicle was dissected to isolate the cystic duct and the cystic artery separately. Both were then clipped and divided. The GB was dissected off its bed with monopolar cautery hook. At completion of surgery, the GB was extracted through the epigastric incision, which was enlarged if necessary. Hemostasis was achieved in gallbladder bed, and after a thorough saline lavage, a suction drain was placed if clinically indicated and the incisions closed. When required, conversion to the open procedure was performed through a right sub costal incision.

Postoperatively, the patients were allowed oral intake 6-12 hours after surgery provided they had no nausea or vomiting. The antibiotic treatment (cefotaxime 1gm every 12 hr.) continue 24-48 hr. postoperatively. Pain relief was obtained by intramuscular diclofenac injection 75mg, which was changed to tablet administration once patient was allowed orally.The patient was discharged once the patient afebrile and taking oral fluid diet. Statistical analysis was performed using the software SPSS and chi-squire test. A P-value less than 0.05 was considered statistically significant. **Results**. During the period of this study, a total of 88 patients underwent LC, 40 patients (45.45%) treated as an early group and 48 patients (54.54%) treated as delayed group. No patient in delayed group required urgent surgery attributable to failure of conservative treatment or recurrent symptoms. The mean operating time was 80 minute(ranging,40-120) in early group and 70 min (ranging, 30-110) in delayed group, longer operation time were required in the early group because of more modifications in the operation technique shown in table 2 with p-value 0.433. Four patients (7.5%) in the early group underwent conversion to open surgery while 3patients(6.25%) in the delayed group with p-value 0.540.The main reasons for conversion in the early cases were technical, including one case of unclear Calot's triangle anatomy, suspicion of bile duct injury and transection of gallbladder at Hartman's pouch. The main reason for conversion in the delayed group involved dense fibrous adhesions around Calot's triangle making dissection difficult.

In our study, decompression of the GB was required for12.5 % of the patients in the early group. Stone spillage was seen in 7.5% which was removed. A sub hepatic drain was required for 50% of the early cases. On the other hand, in the delayed cases, the increase in dense adhesions around the gallbladder and portahepatis made laparoscopic dissection more difficult and constituted the main reason for conversion.

There was no death in either group. The overall complication rate was 8out of 40 (20%) in the early group and 7 out of 48 (14.58%) in the delayed group with P-value about 0.456 as shown in table 3.

Regarding the postoperative pain was much less in early group than delayed group and required less postoperative analgesia with p-value 0.182.The patients in early group discharge to home at 2nd postoperative day after start oral nutrition. The mean duration of postoperative hospital stay was 2.5 days(range 2-8) in the early group and 5 days in delay group (range 2-20 days) with p-value 0.161.

Discussion. In the early years of laparoscopic surgery, AC was considered a relative contraindication to LC. Recently, it has been shown that LC is feasible and safe for AC[9]. Several prospective series have demonstrated advantage to proceeding with LC soon after the diagnosis of acute cholecystitis is made, in one series patients operated on early in the course of their illness(within 48 hours of presentation) where more likely to have the procedure completed laparoscopically than patients with a longer duration of symptoms and also had shorter hospital stay[10].

Most surgeons agree that timing of the procedure is an important factor in determining outcome. Ideally, the surgery should be performed as soon after admission as possible. Although operation within the golden 72 hr. from the onset of symptom has been suggested, such early surgery is notalways possible in clinical practice because there are logistic difficulty in performing surgery for such patients on an emergency basis[11] In another large study of 549 patients undergoing laparoscopic cholecystectomy the conversion rate was 2.9%,

Table 1: Clinical and laboratory results in early and delayed groups.

	Early group	Delay group	p-value
Age(mean) years	42(22-62)	49 year(28-70)	0.435
Sex(M:F ratio)	1:2.3	1:2.2	0.542
Previous lower abdominal surgery	5	6	0.433
Previous biliary symptoms	8	11	0.546
Duration of symptoms >3 days	4	8	0.329
Maximum temperature©	38c	37c	0.712
leukocyte count (>11,000/ml)	11	9	0.192

Table 2: Mmodification of operative technique.

Modification of the technique	Early group	Delayed group	P-value
Gallbladder decompression	5(12.5%)	3(6.25%)	0.001
Retrieval bag	3(7.5%)	2(4.16%)	0.012
Subhepatic drain	20(50%)	7(14.58%)	0.023
Enlargement of epigastric port site	6(15%)	4(8.33%)	0.021
Total	34	16	

Table 3: Operative complications observed.

Complications	Early group	Delayed group	Total
Intraoperative complications hepatic sinus bleeding Bile duct injury Transection of Hartmann's pouch	 2(5%) 2.5%)(1 1(2.5%)	 2(4.16%) 1(2.08%) 1(2.08%)	 4(4.545%) %)272.(2 2(2.27%)
Postoperative complications Major bile leak Ileus Port wound infection Bleeding	 2.5%) (1 2.5%) (1 2.5%)(1 1(2.5%)	 0 2(4.16%) 1(2.08) 0	 1(1.136%) 3(6.25%) 2(2.27%) 1(1.136%)
Total	8(20%)	7(14.58%)	17.045%)(15

difficult dissection being the commonest cause followed by excessive bleeding and suspected bowel injury[11] which is comparable with our study. The success condition of LC in AC is the correct choice of the operative
moment; it should not be delayed more than 4-5 days, otherwise perivesicular adhesions may develop, making the intraoperative lysis much more difficult[12]. The conversion must not be considered a failure, but a reasonable decision for the prevention of complications and injury of the CBD. Various studies have reported high conversion rates, ranging from 6% to 35% for early LC used to manage AC[13]. The higher conversion rate obviates the advantages of early LC. It is therefore argued that if delayed LC leads to a technically easier surgery with a lower conversion rate, it may be a better treatment option for AC. In our study, both the early and delayed groups had insignificant difference of conversion rates. The reasons for conversion, however, were different. In early group, the friable and edematous gallbladder tore when grasped. Moreover, there was excessive oozing attributable to acute inflammation[14].

Although in our study 7.5% conversion rate seems to be higher than that in the delayed group 6.25%, it reflects our safety concerns for the method, and we believe that more experience with early surgery may bring the conversion rate down. A study done by Gurusamy KS, Samraj K.(2006),there was no statistically significant difference between the two groups for any of the outcomes including conversion rate[15].

Regarding the postoperative pain, there are statistically no significant differences for the maximal intensity pain, as well as for the pain in general. In LC, the algic symptoms are usually minor and localized at the trocar points and in the shoulder; they are explained by the irritating action of the carbon dioxide on the diaphragm[16].

There are no significant differences between the postoperative complications. It is important to notice that there is a clear decreasing trend of the complications of LC, especially minor biliary problems, together with increase of the learning curve of the technique and the accumulation of surgical experience[17].

The intestinal transit usually reappeared in 12-24 hours after early LC. The liquid intake was allowed 6 hours after awakening in the early group[18].

The difference in the operation time was not significant, although early group patients required a longer operation time(80 min) than the delayed group(70 min). S.B. Kolla et al(2004) show that, the mean operating time was 104 min in the early group and 93 min in the delayed group[19].

A major advantage of the laparoscopic technique is represented by the significant reduction of the postoperative hospitalization and treatment cost. However, the total hospital stay in the delayed group, which included the total time spent during two admissions (average 5 days), was significantly longer than in the early group (average 2.5 days). A study done by J. A. Lujan 1998, show that the length of the hospital stays averaged 3.3 days for the early group[20].

In summary, early laparoscopic cholecystectomy is a safe, valid alternative to open cholecystectomy in patients with acute cholecystitis. The procedure has a low rate of complications and offers the patients a more comfortable postoperatively. Furthermore, early surgery is associated with a much shorter hospital stay, which is a major economic benefit to both the patient and health care system.

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