



EARLY LAPAROSCOPIC CHOLECYSTECTOMY NOW THE GOLD STANDARD FOR ACUTE CHOLECYSTITIS - A COMPARATIVE STUDY ON OUR EXPERIENCE

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ABSTRACT

Aim: To determine if early laparoscopic cholecystectomy (LC) or delayed laparoscopic cholecystectomy (LC) is gold standard in our experience in Acute Cholecystitis.

Methodology: The study was conducted in Department of General Surgery in Vinayaka Missions Karaikal under same surgical team. We compared surgical difficulties, clinical courses and complications between 20 patients undergoing delayed LC and 25 undergoing early LC.

Results: We came to a conclusion that Delayed LC was associated with more surgical difficulties than early LC, including severe adhesion of the greater omentum (17/ 20vs. 2/25), severe cicatrization of Calot's triangle (15/20 vs. 1/25), inability to identify or skeletonize the cystic duct (18/20 vs. 3/25), and severe cicatrization of the gallbladder bed (17/20vs. 1/25). Delayed LC was also associated with longer operating times (180 vs. 90 minutes), more conversions to open surgery (3/20 vs. 0/25), more complications (4/20 vs. 1/25), and longer hospitalization (16 vs. 8 days).

Conclusion: From our study it is found that it is high time to make early laparoscopic Cholecystectomy the treatment of choice for acute cholecystitis from delayed laparoscopic cholecystectomy as it can effectively reduce operation time, duration of symptoms and hospital stay, and thus be of significant benefit to patients.

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INTRODUCTION

Acute cholecystitis is a pathology of inflammatory origin, usually associated with cholelithiasis, with a high incidence in our environment. There are two surgical treatment for Acute Cholecystitis: early cholecystectomy (EC) during the same admission within 72 hours or delayed cholecystectomy (DC) during a later admission after conservative treatment after 6 weeks. The first studies that assessed EC as a treatment for acute cholecystitis date back to the 1950s (Mulholland, 1957; Ellison, 1957 and Pines, 1959). In 1970, the first controlled study was published by van der Linden and Sunzel, demonstrating better morbidity and shorter average hospital stay after open EC (van der Linden, 1970). Some of the first publications about laparoscopic EC showed bad results in

terms of morbidity and mortality and high percentages of bile duct injuries. Based on these results, laparoscopic EC was considered a contraindication for the treatment of acute cholecystitis and conservative treatment followed by a laparoscopic DC was done by almost all surgeons fearing bile duct injuries. In 1998, Kiviluoto et al. reported similar results in terms of morbidity and mortality between laparoscopic EC and open EC (Kiviluoto, 1998). Recently, many studies have reported similar results in favor of laparoscopic EC. It is important to note that the vast majority of these articles only include laparoscopic cases, which could cause a bias in the external validity of these studies, as they exclude many of the less favorable cases involving open EC (Lai, 1998; Takada, 1995; Norrby, 1983; Lahtinen, 1978; Kum, 1994; Berggren, 1994; Zacks, 2002; Lo, 1998; Kiviluoto, 1998; Casillas, 2008 and Lai, 1998). In spite of many publications that suggest benefits in favor of EC, there is still controversy regarding the timing to perform cholecystectomy. Although literature favors

laparoscopic EC, most evidence comes from prospective studies specifically designed to prove this particular aspect (Lo, 1988; Lai, 1998; Takada, 1995; Norrby, 1983; Lahtinen, 1978 and Kum, 1994), which probably does not reflect the worldwide clinical practice. In addition, it is well known that laparoscopic EC is not the usual practice in many hospitals (Berggren, 1994; Lai, 1998; Chandler, 2000; Gurusamy, 2010; Siddiqui, 2008). We performed 20 delayed laparoscopic cholecystectomy (LC) procedures for acute cholecystitis in mild or moderate cases, following antimicrobial therapy, prior to July 2013, but the results were not satisfactory. The rate of conversion to open surgery was 22% and the mean operation time was 163 ± 65 minutes. Complications occurred in three cases (major bile duct injury, postoperative bleeding, and wound infection). The mean hospital stay was 38 ± 12 days. We therefore introduced the use of early LC for patients with acute cholecystitis, in accordance with the "Guidelines for the Management of Acute Cholangitis and Cholecystitis" introduced in July 2014. The purpose of this study was to determine if early LC, was more effective than delayed LC for the treatment of acute cholecystitis in our hospital under same surgical team.

MATERIALS AND METHODS

Between July 2014 and July 2017, 20 patients underwent delayed LC and 25 patients underwent early LC. The diagnosis and severity assessment of acute cholecystitis. Patients with severe complications, upper abdominal surgery, those receiving medical treatment to dissolve calculi, or patients with uncertain diagnoses of bile duct disease were not eligible for early surgery. After admission, patients in both groups were nil per oral and was put on intravenous fluid infusion and antibiotics. Delayed LC patients underwent ultrasound (US) examinations, enhanced computed tomography (CT). LC was performed in this group after a mean interval of 35 days (range, 12-60 days). In the early LC group, surgery was performed as soon as possible, and within 72 hours of admission. Preoperative examinations included US, enhanced CT and magnetic resonance cholangiopancreatography. Gastrointestinal examinations were not performed. There were no age limits for the procedures. The laparoscopic procedure was the same in both groups. A laparoscopic cannula was inserted in the supraumbilical region, using an open method, for CO₂ insufflation, and a laparoscope was introduced through this cannula. Three other cannulas were inserted. Aspiration of the gallbladder contents was performed when it was difficult to grasp the gallbladder, due to distension. Calot's triangle was identified and the cystic duct was dissected. The cystic artery was identified and dissected, and the gallbladder was then dissected from the liver, from the neck to the fundus of the gallbladder. We retrospectively compared the results of early and delayed LC, focusing on the operative difficulties, conversion to open surgery, operation time, the development of complications, the duration of symptoms, and the length of hospital stay.

OBSERVATIONS AND RESULTS

In characteristics of patients there were no significant differences in patient age, sex, or disease severity between the groups, though there was a significant difference in the interval between admission and surgery (Table 1). No patients in the delayed LC group required emergency surgery.

In terms of surgical difficulties we compared the occurrence of severe adhesion of the omentum or intestine, severe cicatrization of Calot's triangle, difficult dissection of the cystic duct, and severe cicatrization of the gallbladder. Early LC was associated with significantly fewer of all these difficulties (Table 2). One patient who had severe cicatrization of Calot's triangle and the gallbladder bed had previously received conservative treatment for cholecystitis. The conversion rate to open surgery was 3 cases for delayed LC and nil for early LC (Table 3). One intraoperative major bile duct injury, one postoperative bleeding event and one wound infection were recognized in the delayed LC group.

Table 1. Patients characteristics

Characteristics	Delayed LC n=20	Early LC n=25
AGE (years)	50-60	45- 55
SEX (M/F)	8:12	10:15
DISEASE SEVERITY (severe:mild)	4:16	5:20

Table 2. Operative Difficulties

Causes	Delayed LC n=20	Early LC n=25
Severe adhesion	17	2
Difficult dissection of cystic duct	18	3
Severe cicatrization of calot's triangle	15	1
Cicatrization of Gallbladder bed	17	1

Table 3. Conversion to Open surgery

	Delayed LC n=20	Early LC n=25
Total	3	0

The major bile duct injury case was converted to open surgery but the other cases were treated conservatively. In the early LC group, there was one instance of postoperative bile leak, which was resolved within 2 days. There were no reoperations and no hospital mortality (Table 4). Operating time The mean operating time for early LC was 90 minutes (range, 60–120 minutes), while that for delayed LC was 180 minutes (range, 120-240 minutes). The mean operating time was significantly shorter in the early LC group (Table 4).

Table 4. Intraoperative and Postoperative Findings

	Delayed LC n=20	Early LC n=25
Operative Time	90 minutes (60-120)	180 minutes (120-240)
Post Operative Complication	1 (wound infection)	Nil
Time between admission and discharge	28days (24-32)	9days (6-11)
Hospital stay	16 days	8 days
Postoperative Hospital stay	14 days	6 days
Nil Per Oral (postoperation)	3 days (2-5)	1 day (1-2)
Intraoperative Complication	3 (converted to open)	0

The mean operating time for early LC was 90 minutes (range, 60–120 minutes), while that for delayed LC was 180 minutes (range, 120-240 minutes). The mean operating time was significantly shorter in the early LC group (Table 4). Fasting periods were used as an index of recovery. The mean fasting period for early LC was 1 day(1-2), which was significantly shorter than that for delayed LC 3 days(2-5) (Table 4).

Hospital stay and postoperative hospital stay were also significantly shorter in the early LC group (Table 4).

DISCUSSION

In this comprehensive retrospective study, we compared two possible surgical option treatments in the management of acute cholecystitis. We have contrasted the reality of the daily practice in the treatment of acute cholecystitis, without a selection of patients according to age, comorbidity, the severity of the acute cholecystitis or the surgical approach. In this way, our study has also included patients who underwent open surgery that had a greater proportion of cases of moderate and severe cholecystitis, factors that most influence, according to our data, the appearance of complications and mortality. This fact means that studies, which only include laparoscopic surgery cases, may have questionable external validity, due to dismissal of cases that have potentially worse evolution. We have treated 25 cases with early LC to date. Compared with delayed LC, early LC for acute cholecystitis was associated with shorter operation times and reduced durations of symptoms and hospital stay, as described in the guidelines. A study quoted in the guidelines and a later study reported conversion rates to open surgery from early LC of 8% (Lahtinen, 1978) and 21% (Kum, 1994), respectively, and complication rates of 4% (Berggren, 1994) and 13% (Chandler, 2000), respectively. In our study, we experienced no conversions and few complications. This was despite the fact that there were few mild cases in our study, and severe cases, such as those with abscesses, were also included. The reasons for the low conversion and complication rates associated with early LC in our study were a low incidence of adhesions of the omentum or neighboring internal organs, few cases of cicatrization of Calot's triangle, easy identification of the cystic duct, and easy dissection of the gallbladder bed. Although the timing of the delayed LC in the current study was not ideal (Zacks, 2002 and Lo, 1998), the conversion rate of 0% was still superior to those reported in other studies (Zacks, 2002 and Lo, 1998), suggesting a specific advantage of early LC.

However, we gained the impression that more oozing occurred at blunt dissections, compared with during delayed LC, and it is necessary to control this oozing. The good results of our study could also be due to the fact that early LC was only performed by an experienced laparoscopic surgeon. All procedures complied with Japanese guidelines suggesting that early LC should only be performed by surgeons with the appropriate Institute of Laparoscopic Surgeons qualifications. Thus, although early LC is preferable to delayed LC, it cannot be implemented in all hospitals. Hospital stay tended to be shorter for all diseases, including cholecystectomy, during the course of this study. It is possible to reduce the hospital stay for delayed LC patients by discharging them after remission of their symptoms, but readmission may be necessary in some cases. Additionally, a critical pathway can be followed as an alternative to elective LC in our hospital, but not all the patients in the current study followed the critical pathway. The postoperative hospital stay was relatively long in our hospital, because the low patient volume made it possible to adjust the day of discharge to comply with patient wishes. Although early LC appears to be a better treatment for acute cholecystitis, the ability to continue this treatment remains an issue. The question of why it has not been more widely adopted also exists.

Conclusion

Early LC for acute cholecystitis was more effective than delayed LC in terms of on table operative complications, lesser operative time and postoperative hospital stay. Although we did not compare the costs of early and delayed LC, a previous study reported reduced costs for early LC compared with open cholecystectomy (Lai, 1998). Despite the retrospective nature of the current study, the results indicate that treatment of cholecystitis in accordance with the early LC is the gold standard. Although further randomized controlled trials are needed to confirm these findings, we aim to perform early LC for patients with acute cholecystitis in future.

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