Laparoscopic Cholecystectomy for Acute Cholecystitis: Does Timing Matter?

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Received: 28 June 2011 / Accepted: 6 June 2012 / Published online: 16 June 2012
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Abstract Acute cholecystitis is a common cause of acute abdominal pain and the definitive treatment is laparoscopic cholecystectomy. When to perform surgery remains controversial. To find out whether laparoscopic cholecystectomy can be performed for acute cholecystitis irrespective of the time since onset of acute symptoms. A total of 200 laparoscopic cholecystectomies performed for acute cholecystitis were evaluated for duration of surgery, conversion rates, biliary and other organ injury, and postoperative stay. Kruskal–Wallis tests, Mann–Whitney tests, and paired *t*-tests using SPSS software. Thirty patients underwent laparoscopic cholecystectomy within 48 h of onset of symptoms (group 1), 60 patients underwent surgery between 48 h and 6 weeks of onset of symptoms (group 2), and 110 patients underwent surgery after 6 weeks of onset of symptoms (group 3). While the duration of surgery was significantly shorter in group 3 compared to groups 1 and 2 (57.5 min vs. 53.5 min vs. 34.2 min), there were no conversions or major biliary or other organ injury in any of the three groups. Postoperative stay was also comparable between the three groups (3 days vs. 3.1 days vs. 3.08 days). Laparoscopic cholecystectomy can safely be performed at any time after the onset of acute cholecystitis.

Keywords Laparoscopic cholecystectomy · Acute cholecystitis · Timing of surgery · Conversion rates

Introduction

Laparoscopic cholecystectomy has been accepted as the procedure of choice for treatment of symptomatic gallstones and chronic cholecystitis [1, 2]. Its role and its timing in the management of acute cholecystitis are controversial. Acute cholecystitis was traditionally treated with antibiotics and supportive treatment and cholecystectomy was performed after 6 weeks of the acute episode [3]. The potential hazard of severe complications, if surgery is performed in an area of distorted anatomy caused by acute inflammation, is the major concern [4, 5]. Performing this procedure during the phase of acute inflammation is associated, even in expert hands, with a high incidence of conversion to open surgery [6–9], resulting in the loss of the advantages of this minimally invasive procedure. Theoretically, with the use of medical treatment during the acute phase, a safer elective procedure can be performed several weeks afterward, when inflammation and edema have subsided. However, recently laparoscopic cholecystectomy is considered to be the standard of care if the patient is seen within 48 h of the attack of acute cholecystitis because adhesions would not have developed so early after the onset of inflammation [2]. When patients are seen after 48 h from the onset of acute cholecystitis, surgeons however prefer to delay cholecystectomy and prefer conservative treatment followed by an interval cholecystectomy [4]. The rationale for such an approach is that inflammatory adhesions occur within 48 h and make dissection difficult and dangerous, thus prompting most surgeons to wait for 6 more weeks to let adhesions subside, enabling them to perform surgery more safely. The drawback of such an approach is

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that several patients get recurrence of symptoms such as biliary colic or another attack of cholecystitis during this waiting period.

Aim

This study examines whether laparoscopic cholecystectomy can be safely performed in acute cholecystitis irrespective of the time since onset, thereby avoiding the occurrence of recurrent symptoms.

Subjects and Methods

We examined 200 laparoscopic cholecystectomies performed at Holy Cross Hospital, Kottiyam, Kollam, Kerala, from June 2007 to October 2010 for acute cholecystitis. All patients included had features of acute cholecystitis on USG at the time of acute presentation at our hospital or elsewhere.

Of these, 30 cholecystectomies were performed for acute cholecystitis within 48 h of symptoms (group 1), 60 for patients with acute cholecystitis who had presented more than 48 h but less than 6 weeks after the onset of symptoms (group 2), and 110 patients underwent surgery 6 weeks or more after the onset of symptoms (group 3). They were compared on the following parameters:

- Duration of surgery
- Duration of postoperative stay
- Presence of major biliary injury
- Presence of injury to other organs such as colon, duodenum, and liver

Technique

We performed laparoscopic cholecystectomy using a four-port technique. The 10 mm umbilical port is used for a 30° laparoscope. A 10 mm epigastric port serves as the main working port, while a 5 mm right hypochondriac port in the midaxillary line acts as the left-hand port for the surgeon. A 5 mm port in the right iliac fossa is used by the assistant to hold the fundus of the gallbladder and retract it upward. In case of acutely inflamed tense gallbladders, the contents are first aspirated using a suction cautery. The Calot's triangle is then dissected and the cystic artery is cauterized with bipolar cautery. The cystic duct is divided between ligatures and clips. The gallbladder is then dissected off the liver bed using hook cautery. Inflamed gallbladders are retrieved using an endobag through the umbilical port, while others are removed without the endobag through the same port. Port sites are irrigated regularly. Drain is put through the right iliac fossa port if spillage of gallbladder content occurs.

Table 1 Results

	Group 1	Group 2	Group 3
Number of cases	30	60	110
Duration of surgery (mean)	57.5 min	53.5 min	34.2 min
Postoperative stay	3	3.1 days	3.08 days
Major biliary injury	0	0	0
Other organ injury	0	0	0
Conversions	0	0	0

Results

The findings are shown in Table 1.

The results were analyzed using Kruskal–Wallis tests and Mann–Whitney tests with SPSS software.

There was no significant difference in the duration of surgery between group 1 and group 2. However, group 3 had significantly shorter operative times than both group 1 and group 2. Al Qasabi et al. have reported conversion rates of 28.7 % and mean operative times of 98 min for lap cholecystectomy for acute cholecystitis [10]. There was no significant difference in the length of postoperative stay between the three groups. No major biliary injuries or other organ injury was noted in any of the three groups. There were no conversions to open surgery in the three groups.

The intra-operative findings were compared to analyze the difference in operating times (Table 2).

Table 2 Intra-operative findings

	Group 1	Group 2	Group 3	
Pus filled gallbladder	16	22	5	1 vs. 2 $P=0.170$ 2 vs. 3 $P<0.001$ 1 vs. 3 $P<0.001$
Gangrenous gallbladder	5	4	0	1 vs. 2 $P=0.26$ 2 vs. 3 $P=0.015$ 1 vs. 3 $P<0.001$
Adhesions	17	43	78	No significant difference between groups
Endobag retrieval	25	45	46	1 vs. 2 $P=0.3$ 2 vs. 3 $P=0.020$ 1 vs. 3 $P=0.012$
Drain placement	20	36	16	1 vs. 2 $P=0.641$ 2 vs. 3 $P<0.001$ 1 vs. 3 $P<0.001$

Discussion

While the duration of surgery was longer when lap cholecystectomy was performed for acute cholecystitis within 6 weeks of the attack of cholecystitis, the duration of post-operative stay and complications were comparable. Also, there was no significant difference in any of the parameters compared between lap cholecystectomy performed within 48 h of acute cholecystitis and surgery performed after 48 h but before 6 weeks of the attack of acute cholecystitis. The longer duration of surgery for group 1 and group 2 compared to group 3 could be attributed to the significantly higher percentage of pus-filled gallbladder, gangrenous gallbladder encountered during surgery, and the time taken for endobag retrieval and drain placement. Lo et al. compared early (patients presenting within 120 h of the onset of symptoms) with interval cholecystectomy (patients undergoing surgery 6 weeks after the onset of acute symptoms). They reported conversion rates of 7.4 % versus 20 %, operative times of 141.5 ± 55.2 min versus 108.8 ± 47.4 min, and postoperative stay of 4.6 ± 3.2 days versus 2.5 ± 1.4 days between the two groups [11].

Thus, laparoscopic cholecystectomy may be safely performed in patients with acute cholecystitis irrespective of the time since the onset of symptoms.

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