Original Article

Outcomes Of Early Cholecystectomy In Acute Cholecystitis: Prospective 10-Year Experience In A Private Sector Tertiary Care Hospital In Sri Lanka

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Abstract

Introduction: The consensuses of Laparoscopic cholecystectomy (LC) as the treatment of choice in acute cholecystitis (AC) is well agreed upon. The aim of this prospective study was to assess the outcomes of early cholecystectomy (EC), from the first appearance of symptoms in patients diagnosed with AC.

Methods: Data were collected through a computer-based health information system from a private sector tertiary care, Nawaloka Hospital, Colombo, Sri Lanka from 2013 to 2023. The data of 255 patients who had AC and underwent EC were analysed. AC was diagnosed by clinical, laboratory, and radiological parameters. Standard four port laparoscopic technique was used. Operative findings of the gallbladders were recorded as described by Noiret al. Sakuramoto classification was used to record histopathology. The data were evaluated with respect to demographics, duration of hospital stay, duration of operation, adhesion score, conversion rates, morbidity and mortality. All patients were consented during their admission to have their data for research purposes while maintain strict confidentiality. The Ethical clearance was obtained.

Results: The majority were females (73%). The mean age of males was 45±4.6 years and 43±4.7 years in females. The mean time from symptom onset to operation was 32±3.4 hours. The mean duration of operation was 60±6.7 minutes. Majority had mild (36%) to moderate (54%) adhesion scores. The rate of conversion was 3.6%. Average duration of hospital stay was 2.9±1.1 days. No patient had significant morbidity or mortality. Majority of the bile cultures revealed *Enterobacter spp*. Most of the histopathology revealed mild to moderate AC.

Conclusion: Our study showed that EC results in with a shorter duration of operation and hospital stay and lower rates of conversion. Furthermore, there were no significant morbidity or mortality.

Keywords: Cholecystectomy; Cholecystitis; Gallstones; Microflora.

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Introduction

Gallstones disease has already become a significant health concern in developed countries. However, it is becoming a rising problem in developing societies as well, affecting 10% to 15% of the adult population.[1] Even though 70% of the patients with gallstones are reported to be asymptomatic, a total of 15–26% of patients present with acute cholecystitis (AC).[2-8] At present, Laparoscopic cholecystectomy (LC) is the treatment of choice for symptomatic gallstone disease.[3,4] The consensuses of EC as the treatment of choice in AC is well agreed upon, and it is reported that early laparoscopic surgery is a safe procedure. Early cholecystectomy (EC) is defined as a surgery performed within 72 hours of admission, interval cholecystectomy (IC), is defined as cholecystectomy performed 6-8 weeks after symptomatic medical treatment.[8] However, especially in under developed countries due to various economic and logistic drawbacks, the practice of EC as well as the practice of interval LC for AC is not frequent. It is observed that 15% of the patients waiting for interval LC required an urgent surgical intervention during the interval period and another 25% were hospitalized for recurrent attacks.[5-7] The aim of this prospective study was to investigate the outcomes of EC, from the first appearance of symptoms in patients diagnosed with AC.

Methods

Data were collected through a computer-based health information system from a private sector tertiary care, Nawaloka Hospital, Colombo, Sri Lanka from 2013 to 2023. The data of 255 patients who were diagnosed with AC and underwent EC were analysed. AC was diagnosed by clinical, laboratory, and radiological parameters. Clinical criteria were; pain in the right upper quadrant, positive Murphy's sign, local tenderness, and axillary body temperature above 37.5C. Laboratory criteria were; a white blood cell count above 11,000/UL or an increased C-reactive protein (CRP) level above 5 mg/L. Radiological parameters were distended gallbladder, an increase wall thickness, presence of pericholecystic fluid. The standard four port laparoscopic technique was used and the pneumoperitonium was created with open Hasson technique in all cases. Data on needle decompression of Gallbladders and sampling of bile cultures and their results were also analysed. The data on duration of time taken for surgery and length of hospital stay were analysed. The duration of operation was defined as time from skin incision to skin closure. Duration of hospital stay was determined as the time from the operation to discharge.

Operative findings of the gallbladders were recorded as described by Noiret al[9]; Grade 0: No adhesion, Grade 1: Single adherence between two organs or between an organ and the abdominal wall, Grade 2: Two adherences between organs or one organ and the abdominal wall, Grade 3: More than two adherences between organs or a massive generalized adherence of the intestine with no adherence to the abdominal wall and Grade 4: Generalized adherences between organs and the abdominal wall or massive adherence among all organs.

Sakuramoto classification[10] was used to record histopathological results, from no acute inflammatory signs to severe signs of inflammation; None: Free of acute findings, Mild: Only mild neutrophil infiltration, Moderate: Moderate neutrophil infiltration, mucosal oedema, erosion and Severe: Severe neutrophil infiltration, mucosal hyperaemia, bleeding, ulcer, abscess.

Furthermore, the outcomes of the patients were evaluated with respect of per-operative gallbladder perforation, intra and post operative incidence of bleeding, bile duct injury, conversion rates, morbidity such as bile fistula, intra-abdominal abscess, and/or sepsis, surgical site infection, and mortality. All patients were consented during their admission to have their data for research purposes while maintain strict confidentiality. The Ethical clearance was obtained. There were no conflict of interest.

Statistical Analysis: Social Science Statistical Package (SPSS Inc., Chicago, IL, USA) computer software was used for the statistical analysis. The descriptive data were presented as mean, standard deviation and range.

Results

The records of total of 255 patients who had AC and underwent EC were evaluated. There were 69/255 (27%) male and 186/255 (73%) female patients. The mean age of males was 45±4.6 years (32-72 years) and it was 43±4.7 years (27-70 years) in females. The mean time from symptom onset to operation was 32±3.4 hours (22 -48 hours). The mean duration of operation was 60±6.7 minutes (range, 45-90). In terms of adhesion scores, there were 92/255 (36%) Mild (grade 0-1), 138/255(54%) Moderate (grade 2-3) and 25/255 (10%) Severe (grade 4) respectively (**Table 1**).

There was one patient who had a perforation of the gallbladder. A total of nine patients (05 male, 04 female) were converted to open surgery since they had previous abdominal surgeries and dense adhesions. The rate of conversion to open surgery was 3.6% in our study group (**Table 1**). Average duration of hospital stay was 2.9± 1.1 day (2–4 days). Postoperative complications of trocar site infections were found in two patients. No patient was found to have per- or post-operative bleeding, bile duct injury, formation of bile fistula, intra-abdominal abscess, sepsis, and had mortality. Bile culture results showed that majority of the patients had *Enterobacter spp*., 79% followed by *Enterococcus spp*., 15% and *E. coli*, 6%. Majority of the histopathological data revealed that there were mild to moderate AC with gallstones in all patients (**Table 1**).

Table 1. The characteristics of the study sample. (N=255)

Variable		Value
Age in years; mean±SD [Range]		
	Male	45±5.6 [32 to 72]
	Female	43±4.7 [27 to 70]
Sex; n(%)		
	Male	69(27)
	Female	186(73)
Time from symptom onset to operation in hours; mean±SD [Range]		32±3.4 [22 to 48]
Duration of operation in minutes; mean±SD [Range]		60±6.7 [45 to 90]
Adhesion score; n(%)		
	Mild (grade 0-1)	92(36)
	Moderate(grade 2-3)	138(54)
	Severe (grade 4)	25(10)
Bile culture results; n(%)		
	Enterobacter spp	201(79)
	Enterococcus spp	38(15)
	E. coli	16(6)
Histopathological Classification; n(%)		
	Mild	140(55)
	Moderate	102(40)
	Severe	13(5)

Discussion

As literature stated, the incidence of gallstone disease ranged from 10% to 20% in the west. However, 50–70% of patients are asymptomatic. The chances of being complicated when untreated increases at a rate of 1–2% each year.[1,2]

Historically, AC was considered to be contraindication for LC at a time when it just started. Because, it was thought that there was an increased possibility of injury to extra-hepatic bile ducts and vascular structures, and high rate of conversion due to inability to carry out a clear anatomical dissection due to ongoing acute inflammation. Therefore, an interval of 8-12 weeks after medical therapy before LC on patients with AC was preferred.[5,6] With the increase in experience and literature, it was seen that 25% of patients who were awaiting for interval cholecystectomy (IC) were readmitted to hospital with recurrent episodes of cholecystitis.[3,7] Furthermore, studies showed that the dissection had become more difficult in IC as a result of dense adhesions due to repeated episodes of AC and resulted higher complication and conversion rates.[4-6] Therefore, it was suggested that carrying out an EC within 72 hours of symptom onset, is the best time period which is safe and effective in treating AC.[8,11-16] Studies showed that the reasons of conversion to open surgery in AC during LC were late surgery (>7 days), male gender, advanced age, history of biliary disease, recurrent episodes, gallbladder wall thicker than 5mm and, gangrenous cholecystitis.[17,18] Furthermore, according to literature the most common complication of EC in AC was bile leaks.[16]

In keeping with the literature, our study showed a female dominance with regard to gallstone disease and related AC.[11-14] The results of our study showed similarities with the published western literature with regard to the time taken to the surgical intervention from the onset of symptoms and the time taken for the of surgical procedure.[10-18] In terms of histopathological and microbiological findings, our study mostly tallies with the existing literature.[12-16]

Even though there were published data on patients had perforated gallbladders as a sequalae to AC, in our study group there were no perforation of the gallbladder. It was shown in the previous data that the conversions were mainly due to previous abdominal surgeries, which happen to be the main reason among our conversions as well. However, in our study, advanced age, gender, wall thickness of gallbladder, CRP, and leucocyte levels were not associated with conversion to open surgery. There was no significant difference in postoperative hospital stay among our study group in relations to the published literature. Postoperative complications of trocar site infections were found in two patients. No patient was found to have post-operative bleeding, bile duct injury, formation of bile fistula, intra-abdominal abscess, sepsis, and had mortality. These findings were in line with most of the available literature form west.[9-15]

We would like to state that our study observed that EC can be performed with very good results in patients with AC. But the necessary mind-set should be there to proceed with conversion to open surgery in cases when the anatomy of the Calot triangle cannot be delineated comprehensively. In keeping with literature, our results of EC in patients with AC performed within the initial three days from the symptom onset was safe.

Conclusion

Our results suggest that EC is associated with an acceptable duration of operation and hospital stay, as well as less adhesion and lower rates of conversion. Furthermore, our study showed that majority of the patients were females and the overall, outcomes of EC in patients with AC very well.

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