

COMPARATIVE STUDY BETWEEN EARLY VERSUS DELAYED LAPAROSCOPIC CHOLECYSTECTOMY IN CASES OF DELAYED PRESENTATION OF ACUTE CHOLECYSTITIS

By

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ABSTRACT

Background: Gall stones are common and present as acute calculus cholecystitis in 20% of patients with symptomatic disease, with wide variation in severity. The management of patients with gall stone diseases has been revolutionized during the last decade with the introduction and evolution of laparoscopic cholecystectomy. Many studies revealed early laparoscopic cholecystectomy for acute cholecystitis, even beyond 72 hours, which is suggested to be safe and associated with less overall morbidity.

Objective: To evaluate and compare early versus delayed laparoscopic cholecystectomy as a management of patients presented by delayed acute cholecystitis regarding operative and post-operative outcomes.

Patients and Methods: This prospective randomized study was carried out from October 2020 to April 2021 at the Department of General Surgery, Al-Azhar University Hospitals, Cairo, Egypt. It included 40 adult patients with delayed acute calculous cholecystitis. Those patients were classified into two equal groups: Early group in whom laparoscopic cholecystectomy (LC) was done immediately after the first 72 hours till one week, and Late group in whom LC was done after 6 to 8 weeks of receiving medical treatment. Comparison was applied between the two groups.

Results: This study clearly revealed that performing immediate LC within one week for patients presenting with delayed acute cholecystitis in comparison to delayed LC after medical treatment had better outcome. It had the shorter hospital stay, and less postoperative complications. The comparison between two groups revealed that immediate LC in delayed acute cholecystitis had the upper hand of the advantages and the least disadvantages rather than the other group.

Conclusion: Early laparoscopic cholecystectomy for patients with delayed acute cholecystitis has both medical and socioeconomic benefits, and it is the preferred approach in comparison to delayed approach.

Keywords: Acute Cholecystitis, laparoscopic cholecystectomy.

INTRODUCTION

Gall bladder disease is among the leading causes for hospital admission for acute abdomen among adults and the most common indication for abdominal surgery

in the elderly. Gall stones are common and present as acute calculus cholecystitis in 20% of patients with symptomatic disease, with wide variation in severity (*Mika et al. 2015*).

Acute cholecystitis is one of the important causes of abdominal pain on presentation to the emergency departments. Early diagnosis and treatment of acute cholecystitis has a positive effect on morbidity and mortality (*Masamichi et al., 2012*).

Acute cholecystitis is usually diagnosed based on the presence of non-characteristic local, and/or systemic inflammatory findings, and/or the result of ultrasonographic examination (*Miho et al., 2017*).

Following the first episode of acute cholecystitis, the annual risk of gallstone-related complications can increase up to 30%; and laparoscopic cholecystectomy (LC) is the first-line definitive surgical management (*Saber and Hokkam, 2014*).

Laparoscopic cholecystectomy has become the gold standard in the treatment of symptomatic cholelithiasis, and has revolutionized minimally invasive procedures (*Livingston and Rege, 2014*).

Operating acutely was believed to be more technically challenging due to distorted anatomy from acute inflammation (a cooling off period) and has been advocated and accepted by many general surgeons usually 4-6 weeks after the onset of symptoms (*Choi et al., 2011*).

Delaying definitive management for acute cholecystitis, however, leads to additional complications including failure of non-operative management requiring urgent surgery. Further readmissions for complications of cholelithiasis included recurrent acute cholecystitis, repeated episodes of biliary colic, biliary pancreatitis and cholangitis. Furthermore, chronic inflammation leading to fibrosis,

adhesions and anatomy distortion may lead to a difficult dissection in laparoscopic cholecystectomy (*Amy et al., 2015*).

Early laparoscopic cholecystectomy for Acute Cholecystitis even beyond 72 hours is suggested to be safe and associated with less overall morbidity, shorter total hospital stay, and duration of antibiotic therapy, as well as reduced cost compared with delayed cholecystectomy (*Roulin et al., 2016*).

The present work aimed to evaluate the safety of immediate over delayed laparoscopic cholecystectomy in patients with delayed acute calculous cholecystitis.

PATIENTS AND METHODS

This prospective randomized study was carried out from October 2020 to April 2021 at the Department of General Surgery, Al-Azhar University Hospitals, Egypt. It included 40 adult patients with delayed acute calculous cholecystitis. All patients were subjected to complete evaluation through detailed history, complete physical examination, laboratory investigations and imaging study Ultra Sound (US) was performed to all patients.

All patients had pre-operative ultrasound commenting on the gall bladder wall thickness, the number of the stones, their size and site and presence of pericholecystic fluid collection along with other intra-abdominal and pelvic organs pathology. Patients to be excluded were those with suspected common bile duct stone, previous upper abdominal surgery, patients not responding medical treatment and diabetic patients.

Patients were classified into two equal groups: Early group in whom LC was done immediately after admission within one week of symptoms (Group A), and Late group in whom LC was done after 6 to 8 weeks of receiving medical treatment (Group B). LC was done in all patients by the same surgical team using the standard technique of operation. The operative time was calculated from the start of the incision until placement of the last suture. The outcome and complications of LC, the rate of conversion to an open procedure, operative time and hospital stay were recorded. Hospital stay included all periods of admission for LC and recurrent biliary symptoms. All patients were followed up and instructed to notify

the surgeon if there were any biliary symptoms.

Statistical methods:

Gathered data were processed using SPSS version 15 (SPSS Inc., Chicago, IL, USA). Quantitative data were expressed as mean ± SD while qualitative data were expressed as numbers and percentages (%). Independent student test was used to test significance of difference for quantitative variables, while Chi square or fisher’s exact test was used to test significance of difference for qualitative variables. A probability values (p-value) <0.05 was considered statistically significant.

RESULTS

No statistical significant difference (p-value > 0.05) between studied groups as

regard laboratory Investigations and U/S findings. (Table 1).

Table (1): Comparison between studied groups as regards laboratory investigations and U/S findings

Parameters	Group (A) N= 20		Group (B) N= 20		P value
	Number	%	Number	%	
WBC >11.000/ml	13	65	10	50	0.337
Thick GB wall	13	65	12	60	0.744
Distended GB	17	85	14	70	0.256
Peri-cholecystic collection	3	15	2	10	0.633

No statistical significant difference (p-value > 0.05) between studied groups as

regards intraoperative and postoperative complications (**Table 2**).

Table (2): Comparison between studied groups as regard intraoperative and postoperative complications

Parameters	Group (A) N= 20		Group (B) N= 20		P value
	Number	%	Number	%	
Bleeding	1	5	0	0	1
Wound infection	2	10	3	15	1
Bile leak	1	5	0	0	1
Collection	1	5	2	10	1
Jaundice	0	0	1	5	1
Postoperative complications	4	20	6	30	0.716

The correlation between the two groups showed that there was a

statistically significant difference in favor of group A (**Table 3**).

Table (3): Total hospital stay in studied groups

Groups	Hospital stay	Range	Mean \pm SD	P-value
Group A		3.5 – 6	4.80 \pm 0.91	<0.001
Group B		7 – 12	9.20 \pm 1.61	

DISCUSSION

Acute cholecystitis is the most common cause of hospitalization for gastrointestinal disease. Although cholecystectomy is the definitive management, the timing of surgery in relation to the first episode of acute cholecystitis remains an area of considerable practice variation (*De Mestral et al., 2013*).

Several randomized controlled trials have shown that early laparoscopic cholecystectomy (within up to 7 days of symptom onset) is associated with a shorter total hospital length of stay and a

similar rate of conversion to an open procedure, when compared with delayed cholecystectomy (*Yamashita et al., 2013*).

Furthermore, early surgery reduces the risk of recurrent gallstone-related symptoms that affect nearly 20% of patients. However despite this evidence and expert consensus supporting early laparoscopic cholecystectomy, rates of early surgery remains variable because concern remains that rare but devastating complication such as major bile duct injury or death may occur more frequently in the setting of emergency surgery on an

acutely inflamed gall bladder (*Greenstein et al.*, 2012).

In this study, we have evaluated two different approaches (immediate LC versus delayed LC after 6 to 8 weeks of medications in patients presenting by delayed acute calculous cholecystitis).

The range of age of patients with acute cholecystitis in the early group was 30 to 65 years with a mean age of 47 ± 11.46 years, and the range of age of patients with acute cholecystitis in the delayed group was 32 to 70 with a mean age of 48.9 ± 10.67 years. According to *Eldar et al.* (2017), the range of the age of patients with acute cholecystitis going to laparoscopic cholecystectomy was 18 to 92 years with a mean of 62 ± 15 years; while *Greenwald et al.* (2018) reported in that the mean of age of patients with acute cholecystitis undergoing laparoscopic cholecystectomy was 49.6 ± 17.3 years. The extreme of age of patients in the study of *Eldar et al.* (2017), may explain the higher rate of conversion to open cholecystectomy which was 24%, while according to *Greenwald et al.* (2018), the mean of age of patients was 49.6 years which is close to our mean of age of patients. That is why the rate of conversion to open cholecystectomy in *Greenwald et al.* (2018), was 13%, while the rate of conversion in our study was 17%.

In the current study, the operative time in the early group ranged from 85 to 140 minutes with a mean of 108.9 ± 14.75 minutes, and the operative time in the delayed group ranged from 65 to 106 minutes with a mean of 86.3 ± 12.4 minutes. The relatively longer operative time in the early group could be explained

by time taken for dissection of adhesions, difficulty of grasping the gall bladder, and some modifications as aspiration of the gallbladder. According to *Sushant et al.* (2013), the mean operative time in the early group was 65.78 minutes, and the mean operative time in the delayed group was 56.83 minutes. According to *Kolla et al.* (2014), the mean operative time in the early group was 104.3 ± 44 minutes, and the mean operative time in the delayed group was 93 ± 45 minutes.

In this study, the conversion rate to open cholecystectomy in the early group was 15% and the rate of conversion to open cholecystectomy in the delayed group was 20%. According to *Gutt et al.* (2013), the conversion rate to open cholecystectomy was 9.9% in the early group, while the rate of conversion to open cholecystectomy was 11.9% in the delayed group. On the other hand, the rate of conversion to open cholecystectomy according to *Kolla et al.* (2014) was 25% in both early and delayed group.

In this study, the total hospital stay in the early group ranged from 3.5 to 6 days with a mean of 4.8 ± 0.91 days, and the total hospital stay in the delayed group ranged from 7 to 12 days with a mean of 9.2 ± 1.61 days. According to *Gutt et al.* (2013), the total hospital stay in the early group ranged from 4 to 6 days with a mean of 5.4 days, and the total hospital stay in the delayed group ranged from 7 to 12 days with a mean of 10.03 days. There was a close correlation between our study and *Gutt et al.* (2013) also, the total hospital stay in the delayed group was double that in the early group. So, early laparoscopic cholecystectomy is more economic. According to *kolla et al.* (2014)

the mean of total hospital stay in the early group was 4.1 ± 8.6 days and the mean of total hospital stay in the delayed group was 10.1 ± 6.1 days. There was a significant decrease in hospital stay in cases having early laparoscopic cholecystectomy when compared to those undergoing delayed laparoscopic cholecystectomy. The result of our study was in harmony with similar several studies in literature.

CONCLUSION

Early laparoscopic cholecystectomy for patients with delayed acute cholecystitis has both medical and socioeconomic benefits, and it is the preferred approach in comparison to delayed approach.

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دراسة مقارنة بين إستئصال المرارة العاجل والمتأخر بمنظار البطن الجراحي في حالات العرض المتأخر لمرضى إلتهاب المرارة الحاد

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خلفية البحث: تعد حصوات المرارة من أشهر الأمراض المنتشرة التى تسبب إلتهاب الحويصلة المرارية الحاد في 20% من المرضى الذين يعانون من أعراض حصوات المرارة مع إختلاف درجات الشدة. وقد أحدث ظهور منظار البطن فى العقود الأخيرة ثورة فى علاج الإلتهاب المرارى بسبب الحصوات حيث أثبتت العديد من الدراسات أن استئصال المرارة الملتهبة إلتهاباً حاداً بسبب الحصوات مبكراً حتى بعد مرور 72 ساعة من ظهور الأعراض يعد آمناً ويقلل فى المضاعفات والمخاطر المحتملة.

الهدف من البحث: تقييم تأثير الفترة الزمنية بين إستئصال المرارة بالمنظار الجراحي في المرضى الذين يعانون من العرض المتأخر لإلتهاب المرارة الحاد بخصوص المضاعفات أثناء أو بعد العملية.

المرضى وطرق البحث: أجريت هذه الدراسة في مستشفيات جامعة الأزهر بالقاهرة قسم الجراحة العامة خلال الفترة من أكتوبر 2020 حتى أبريل 2021 على 40 مريضاً. وأدرج في هذه الدراسة كل المرضى الذين يشكون من العرض المتأخر لإلتهاب الحويصلة المرارية، وقد تم تقسيم المرضى إلي مجموعتين متساوتين:

- **الأولى:** المرضى الذين تم إستئصال المرارة لديهم بالمنظار الجراحي فى خلال أسبوع من ظهور الأعراض.

• **الثانية:** المرضى الذين تم إستئصال المرارة لديهم بالمنظار الجراحي لهم بعد 6 حتى 8 أسابيع من أخذ العلاج التحفظي.

نتائج البحث: إجراء عملية إستئصال المرارة بمنظار البطن مبكراً خلال أول أسبوع فى مرضى إتهاب الحوصلة المرارية نتائجه أفضل من إجراء العملية متأخراً بعد العلاج حيث أنها نتائج الخيار الأول أفضل ومدة الإقامة بالمستشفى أقل وبالمقارنة بين الخيارين تبين أن الأفضلية من حيث المميزات وتجنب المضاعفات لصالح المجموعة الأولى.

الاستنتاج: أثبتت الدراسة أفضلية إزالة المرارة بالمنظار مباشرة من حيث النتائج والمضاعفات أثناء و بعد العملية والقيمة الاقتصادية، وهذا يشجع على إستخدام هذا النهج فى التعامل مع حالات إتهاب الحوصلة المرارية الحاد.

الكلمات الدالة: إتهاب المرارة الحاد، إستئصال المرارة بالمنظار.