นิพนธ์ต้นฉบับ

ผลลัพธ์ทางคลินิกระหว่างการผ่าตัดถุงน้ำดีภายใน 72 ชั่วโมง และ ภายหลัง 72 ชั่วโมง หลังจากได้รับการส่องกล้องทางเดินน้ำดีในผู้ป่วยที่มีนิ่วในท่อน้ำดี: การศึกษาแบบย้อนหลัง

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บทคัดย่อ

บทนำ: การรักษานิ่วในท่อน้ำดี (CBD stone) ส่วนใหญ่รักษาโดยการส่องกล้องทางเดินน้ำดี (Endoscopic retrograde cholangiopancreatography: ERCP) ตามด้วยการผ่าตัดถุงน้ำดีแบบส่องกล้อง (Laparoscopic cholecystectomy: LC) ซึ่งสามารถให้การผ่าตัดทันทีหรือการนัดผ่าตัดในภายหลัง

วัตถุประสงค์: เพื่อประเมิน และเปรียบเทียบผลการรักษาทางคลินิกระหว่างการผ่าตัดถุงน้ำดีภายใน 72 ชั่วโมง และภายหลัง 72 ชั่วโมง หลังจากได้รับการส่องกล้องทางเดินน้ำดี ในผู้ป่วยที่มีนิ่วในท่อน้ำดี โรงพยาบาลนครพิงค์

วิธีการศึกษา: การศึกษาแบบย้อนหลัง รวบรวมข้อมูลจากฐานข้อมูลในระบบโรงพยาบาลนครพิงค์ ในผู้ป่วยอายุระหว่าง 18 ถึง 80 ปี ที่เข้ารับการผ่าตัดถุงน้ำดีด้วยกล้องทางหน้าท้อง ภายหลังจากการส่องกล้องทางเดินน้ำดี ที่โรงพยาบาลนครพิงค์ ระหว่างเดือนมิถุนายน พ.ศ. 2564 ถึง เดือนธันวาคม พ.ศ. 2566 โดยแบ่งเป็นกลุ่มได้รับการผ่าตัดภายใน 72 ชั่วโมง หลังส่องกล้องทางเดินน้ำดี และกลุ่มได้รับการผ่าตัดภายหลัง 72 ชั่วโมง หลังส่องกล้องทางเดินน้ำดี โดยผลลัพธ์หลักคือ การเกิดการบาดเจ็บของท่อน้ำดี ผลลัพธ์รอง ได้แก่ ระยะเวลานอนโรงพยาบาล ภาวะแทรกซ้อนขณะผ่าตัด และคะแนนความยากของการผ่าตัดตามเกณฑ์ Delphi วิเคราะห์ข้อมูล และนำเสนอในรูปของค่าความแตกต่างของความเสี่ยง (risk differences) และของค่าเฉลี่ย พร้อมช่วงความเชื่อมั่น 95%

ผลการศึกษา: ผู้ป่วยทั้งหมด 84 รายที่เข้าเกณฑ์การศึกษา เป็นกลุ่มได้รับการผ่าตัดภายใน 72 ชั่วโมง 43 ราย (ร้อยละ 51.2) และกลุ่มได้รับการผ่าตัดภายหลัง 72 ชั่วโมง 41 ราย (ร้อยละ 48.8) พบว่า ทั้งสองกลุ่มมีอัตราการเกิดภาวะแทรกซ้อนจากการบาดเจ็บของท่อน้ำดีไม่แตกต่างกัน (ค่าความแตกต่างของความเสี่ยงเท่ากับ -2.44% ช่วงความเชื่อมั่น 95%: -2.23 ถึง 7.16) กลุ่มที่ได้รับการผ่าตัดภายใน 72 ชั่วโมง มีระยะเวลานอนโรงพยาบาลโดยรวมน้อยกว่า กลุ่มที่ได้รับการผ่าตัดภายหลัง 72 ชั่วโมง อย่างมีนัยสำคัญทางสถิติ (ความแตกต่างค่าเฉลี่ย -2.48 วัน; ช่วงความเชื่อมั่น 95%: -3.62 ถึง -1.33; $p < 0.001$) อย่างไรก็ตาม ไม่พบความแตกต่างอย่างมีนัยสำคัญในผลลัพธ์อื่น เช่น คะแนนความยากของการผ่าตัดตามเกณฑ์ Delphi (ความแตกต่างเฉลี่ย -0.28, ช่วงความเชื่อมั่น 95%: -2.15 ถึง 1.60; $p = 0.770$)

สรุป: จากการศึกษานี้ การบาดเจ็บของท่อน้ำดี และภาวะแทรกซ้อนจากการผ่าตัด ระหว่างการได้รับการผ่าตัดถุงน้ำดีหลังจากการส่องกล้องทางเดินน้ำดี ภายใน 72 ชั่วโมง ไม่แตกต่างกับภายหลัง 72 ชั่วโมง แต่มีระยะเวลาการนอนโรงพยาบาลโดยรวมน้อยกว่า ดังนั้นการผ่าตัดถุงน้ำดีเร็วภายใน 72 ชั่วโมง น่าจะเป็นทางเลือกที่เหมาะสม

คำสำคัญ: การบาดเจ็บของท่อน้ำดี, การผ่าตัดถุงน้ำดีภายใน 72 ชั่วโมง, การผ่าตัดถุงน้ำดีภายหลัง 72 ชั่วโมง, นิ่วในท่อน้ำดี, การส่องกล้องทางเดินน้ำดี

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Original Article

Comparison of clinical outcomes of early versus delayed laparoscopic cholecystectomy after endoscopic retrograde cholangiopancreatography in patients with common bile duct stones: A retrospective cohort study

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ABSTRACT

Introduction: Distal common bile duct (CBD) stone is mostly managed by endoscopic retrograde cholangiopancreatography (ERCP) followed by either promptly laparoscopic cholecystectomy (LC) or delayed fashion. However, there is no consensus guideline in timing of LC after ERCP in CBD stones patient.

Objective: This study aims to compare the clinical outcomes between early and delayed LC following ERCP in patients with CBD stones at Nakornping hospital.

Study Methods: A retrospective, observational study was conducted in patients aged 18 to 80 years who underwent elective laparoscopic cholecystectomy (LC) after endoscopic retrograde cholangiopancreatography (ERCP) at Nakornping Hospital between June 2021 and December 2023. Patients were divided into early LC (within 72 hours after ERCP) and delayed LC (more than 72 hours after ERCP). The primary endpoint was the occurrence of bile duct injury (BDI) and secondary endpoints were intraoperative complications. Data analysis was presented as risk differences with 95% confidence intervals. Secondary endpoints included length of hospital stay, and Delphi's difficulty score, the results were presented as mean differences with 95% CI.

Results: A total of 84 patients who underwent elective laparoscopic cholecystectomy (LC) after ERCP were retrospectively analyzed, with 43 patients (51.2%) in the early LC group and 41 (48.8%) in the delayed LC group. The analysis indicated that early LC was comparable to delayed LC in terms of bile duct injury (BDI), with a risk difference of -2.44% (95% CI: -2.23 to 7.16). The secondary outcome of patients in the early LC group had a statistically significant reduction in overall hospital stay compared to those in the delayed group; mean difference: -2.48 days; 95% CI: -3.62 to -1.33; $p < 0.001$ while other outcomes had no difference between groups including the Delphi's difficulty score; mean difference: -0.28; 95% CI: -2.15 to 1.60; $p = 0.770$.

Conclusion: Early LC was comparable to delayed LC concerning BDI and Delphi's difficulty score. In addition, early LC subsequently to ERCP-induced stone extraction demonstrated significantly shorter overall length of hospital stay. Therefore, it is preferred when feasible.

Keywords: bile duct injury, early laparoscopic cholecystectomy, delayed LC, common bile duct stone, endoscopic retrograde cholangiopancreatography

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Background

Common bile duct stones (choledocholithiasis) most frequently result from the migration of gallstones from the gallbladder into the biliary tree. Gallstones are the consequence of cholesterol supersaturation in bile, inadequate bile salt levels or function, and diminished contractility of the biliary epithelium which involved in the multi - factorial effects of diet, hormones, and genetic predisposition.[1]

Contributing factors encompass ethnicity, lifestyle, female gender, pregnancy, age, familial history, and obesity, fostering the genesis of gallbladder and bile duct stones. The prevalence of gallbladder stones has risen notably in Asian populations, with approximately 10% incidence in East Asia. Furthermore, around 10-15%[2-3] of individuals with gallbladder stones may also have bile duct stones. In Asia, gallbladder and bile duct stones predominantly contribute to this occurrence, representing approximately 78.3% and 20.3%, respectively.[2]

Symptoms of CBD stones include upper abdominal pain, jaundice, or bile duct infections.[4] For diagnostic investigations, according to recent 2017 guideline from The British Society of Gastroenterology[5] recommends abdominal ultrasound alongside liver function tests. If the findings are inconclusive, additional modalities such as magnetic resonance cholangiopancreatography (MRCP) or endoscopic ultrasound (EUS) may be necessary.[2]

High-risk criteria for choledocholithiasis include the presence of a common bile duct stone on ultrasound (US) or cross-sectional imaging, total bilirubin > 4 mg/dL with a dilated common bile duct, and ascending cholangitis. Patients meeting these criteria should promptly undergo endoscopic retrograde cholangiopancreatography (ERCP).[6] This biliary stenosis or blockage increases pressure within the biliary system and forces microorganisms or endotoxins from the infected bile into the systemic circulation, inducing a systemic inflammatory response.[7] According to the diagnostic and severity grading criteria in the 2013 and 2018 Tokyo Guidelines (TG13/TG18), a diagnosis of acute cholangitis can be made if a patient presents with three key features: systemic inflammation, cholestasis, and bile duct lesions identified on imaging.[8]

There are several approaches when cholecystectomy is planned: frequently described as one-step or two-step approach. One-step approach refers to bile duct stone clearance and cholecystectomy at the same operation, usually by minimal invasive surgery. Two-step approach, more frequently used, is to perform ERCP before cholecystectomy.[6] Previously, a meta-analysis suggested LC after ERCP reduces complications such as acute liver

inflammation, bile duct infections, and gallbladder inflammation compared to no LC.[6] However, there is no consensus guideline on the timing of laparoscopic cholecystectomy (LC) after ERCP in patients with common bile duct (CBD) stones. For patients with mild or moderate choledocholithiasis, if possible, the underlying etiology should be treated at the same time as biliary drainage.[8] Aziret, et al study showed that early (within 72 hours after ERCP) LC following stone extraction associated with reduced operation time, fewer gallbladder fibrotic changes, and decreased likelihood of complications. Meanwhile, Mann, et al stated that timing of LC approximately 6 weeks after bile duct clearance procedures was safe and had low rate of complications.[1]

This study aims to compare the occurrence of bile duct injury (BDI), duration of hospitalization, intraoperative complications and Delphi's difficulty score between early and delayed LC following ERCP in patients with CBD stones at Nakornping hospital.

Patients and Methods

A retrospective observational study was conducted on patients diagnosed with common bile duct (CBD) stones with gallstones who underwent ERCP for CBD stone clearance followed by elective laparoscopic cholecystectomy (LC) during June 2021 and December 2023, at Nakornping Hospital.

Inclusion criteria were patients diagnosed with common bile duct stones and gallstones, aged between 18 and 80 years, classified as American Society of Anesthesiologists (ASA) Physical Status class I–III, and who underwent laparoscopic cholecystectomy (LC) after ERCP.

Exclusion criteria were patients who underwent repeated ERCP for stone extraction or had acute cholecystitis requiring emergency LC.

Sample size calculation

The primary outcome for sample size calculation was the proportion of patients experiencing bile duct injury following LC after ERCP among patients with bile duct stones, comparing those who underwent gallbladder surgery within 72 hours to those who had the surgery after 72 hours following stone removal.

From June 2021 to December 2023, there were 536 patients who received LC in Nakornping Hospital. By excluding patients aged under 18 and over 80, ASA classification > 3, acute cholecystitis requiring emergency LC, remaining 84 patients were diagnosed with common bile duct stones with gallstone. The diagnosis was based on clinical features of abdominal pain and/or jaundice together with confirmed CBD stones from imaging such as ultrasonography, computed tomography, and magnetic resonance imaging. Patients were divided into two groups. The first group, patients who underwent LC within 72 hours following ERCP (early LC group) and the second group, underwent LC over 72

hours following ERCP (delayed LC group). (Figure 1.)

Definition

Early LC: underwent LC within 72 hours following ERCP

Delayed LC: underwent LC over 72 hours following ERCP

Conversion: conversion from laparoscopic cholecystectomy to open surgery

Data collection

Preoperative data were collected including sex, age, gender, comorbidity, ASA, BMI, imaging findings, and laboratory investigations such as complete blood count, coagulogram, liver function tests, and other blood chemistry. Intraoperative data including immediate bile duct injury, other intraoperative complications, conversion rate, operative time and blood loss, and Delphis's difficulty score[2] were recorded. Postoperative adverse events such as early and delayed bile duct injury, bile leakage, postoperative complications and length of stay (LOS) were also recorded.

Outcomes

Primary outcome focused on the occurrence of bile duct injury (BDI) between early LC group and delayed LC group. Secondary outcomes encompassed the comparison of duration of hospitalization, intraoperative complications, Delphi's difficulty score (TG18)[9] and mean ± SD

Statistical Analysis

The study was designed to determine whether early LC was comparable to delayed LC. Normally distributed continuous variables were analyzed by independent-samples t-test. While the non-normal distributed variables were analyzed by Mann-Whitney U test. Fisher's exact test was used to analyze categorical data. Relative risk regression was performed to control confounding factors and presented with risk difference (RD) and 95% confidence interval (CI). All statistical analyses were performed using standard statistical software (STATA version 16.1).

The study was approved by the ethics committee of Nakornping Hospital (Approval number: NKP, No 107/68, date of approval June 16, 2025).

Results

Of 84 patients diagnosed with common bile duct (CBD) stones and gallstones, the first group underwent LC within 72 hours following ERCP (early LC group), (n=43, 51.2%) and the second group underwent LC over 72 hours following ERCP (delayed LC group) (n=41, 48.8%) (Figure 1). There was no significant difference of demographic data between the two groups in age, gender, BMI, ASA classification, comorbidity, previous abdominal surgery, and gallstone diameter. Only diabetes mellitus (DM) proportion was found to be statistically significant difference (p=0.049). Median (IQR) time interval from ERCP to LC showed a substantial difference between the early LC group and delayed LC group, 55.8 (47.0) hours and 1,584 (2,112.0) hours, respectively ($p < 0.001$). As shown in Table 1.

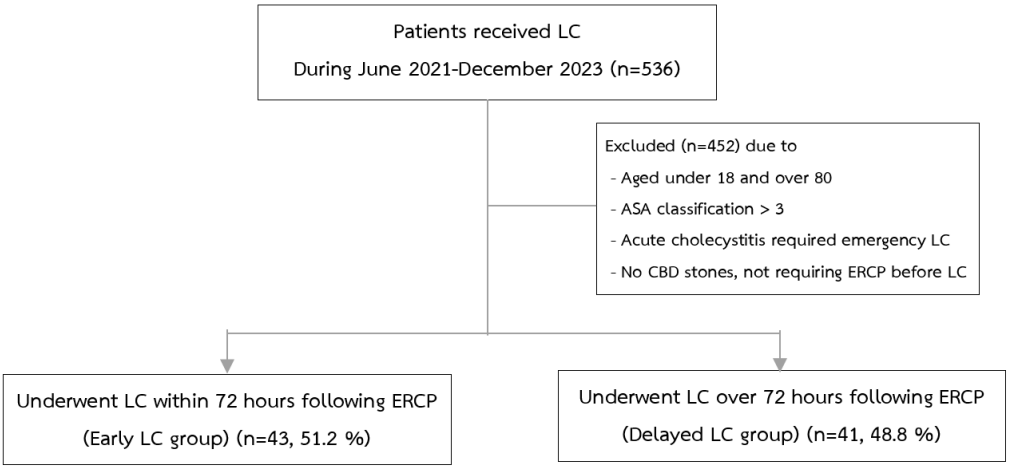

Figure 1 Study flow

Table 1 Baseline demographic and preoperative data.

Variables	Early LC group (n=43) n (%)	Delayed LC group (n=41) n (%)	p - value
Age (years), mean ± SD	62.2 ± 17.3	57.2 ± 16.3	0.178
Gender			0.503
Male	15 (34.9)	18 (43.9)	
Female	28 (65.1)	23 (56.1)	
BMI (kg/m2), mean ± SD	23.7 ± 3.8	23.5 ± 3.4	0.865
ASA class			0.100
1	10 (23.3)	9 (21.9)	
2	14 (32.5)	22 (53.7)	
3	19 (44.2)	10 (24.4)	
Comorbidities			
DM	4 (9.3)	11 (26.8)	0.047
Hypertension	17 (39.5)	22 (53.7)	0.274
Dyslipidemia	10 (23.3)	12 (29.3)	0.623
Others	15 (34.9)	11 (26.8)	0.484
Any Comorbidities			0.384
Yes	23 (53.5)	26 (63.4)	
No	20 (46.5)	15 (36.6)	
Previous abdominal surgery			0.307
Yes	3 (7.0)	6 (14.6)	
No	40 (93.0)	35 (85.4)	
Gallbladder stone diameter by US (mm), mean ± SD	0.7 ± 0.5	0.8 ± 0.5	0.578
Time from ERCP to LC (hr), median ± IQR	55.8 ± 47.0	1584.0 ± 2112.0	<0.001
Preoperative laboratory, mean ± SD			
Platelet (x 10^3)	286.9 ± 102.2	266.5 ± 71.2	0.290
PT (seconds)	12.7 ±1.0	12.8 ± 1.2	0.557
PTT (seconds)	26.6 ± 2.9	26.8 ± 4.3	0.713
INR	1.0 ± 0.1	1.0 ± 0.1	0.989

Table 1 Baseline demographic and preoperative data. (Cont.)

Variables	Early LC group (n=43) n (%)	Delayed LC group (n=41) n (%)	p - value
Albumin (mg/dL)	4.1 ± 0.4	4.2 ± 0.5	0.189
Globulin (mg/dL)	3.5 ± 0.5	3.3 ± 0.5	0.086
Total bilirubin (mg/dL), median ± IQR	0.80 ± 0.69	0.63 ± 0.28	0.004
Direct bilirubin (mg/dL), median ± IQR	0.35 ± 0.47	0.28 ± 0.12	0.003
AST (mg/dL), median ± IQR,	26 ± 19	19 ± 10	0.028
ALT (mg/dL), median ± IQR	23 ± 57	20 ± 10	0.026
ALP (mg/dL), median ± IQR	94 ± 66	80 ± 42	0.069

There were no significant differences between two groups in terms of immediate, early and delayed bile duct injury or leakage (early LC group (0%) and delayed LC group (2.4 %), p=0.488), and other intraoperative complications (early LC group (0%) and delayed LC group (4.9 %), p=0.235). However, one patient in delayed LC group encountered immediate bile duct injury, inevitably open conversion for primary repair with internal stent placement was performed. Two patients in delayed LC group also had colonic injuries, which were primary repaired laparoscopically successfully, whereas, in early LC group, there was no bile duct injury or other intraoperative complications. Conversion rates were comparable between the early LC group and delayed LC group, 6.9% and 7.3% respectively (p=1.000). Both operative time and blood loss were not significantly different, mean operative time in early LC group was 84.6 (26.4) minutes, while in delayed LC group was 96.3 (47.3) minutes, (p=0.168) and median blood loss in two groups were 54.8 (IQR 85.6) ml and 33.7 (IQR 55.0) ml, respectively, (p=0.185). Delphi's difficulty mean score in both groups were not different (early LC group (6.8 ± 4.3) and delayed LC group (7.3 ± 4.1), p=0.587). Interestingly, the mean overall length of stay (LOS) was significantly shorter in the early LC group, 5.8 ± 1.5 days compared to 7.9 ± 3.4 days in delayed LC group. (p < 0.001). (Table 2)

Among total of 84 patients in the study, the findings indicated that early LC group had lower rate of bile duct injury compared to delayed LC group (Adj. Beta difference -2.44%, 95% CI -2.23, 7.16), but not statistically significant. Moreover, early LC group exhibited a statistically significant reduction in the overall length of hospital stay compared to the delayed LC group (Adj. Beta difference -2.48, 95% CI -3.62, -1.33, p < 0.001). After controlling DM, the results were consistent with the main analysis (Table 3)

Table 2 Comparison between intra-operative and postoperative variables

Clinical outcomes	Early LC (n=42) n (%)	Delayed LC (n=41) n (%)	p-value
Intraoperative complications			
Bile leakage/CBD leakage, Bile duct injury	0 (0)	1 (2.4)	0.488
Colonic injury	0 (0)	2 (4.9)	0.235
Clavien - Dindo classification			0.236
0	43 (100)	39 (95.1)	
1	0	0	
2	0	0	
3	0	1 (2.4)	
4	0	1 (2.4)	
5	0	0	
Conversion	3 (6.9)	3 (7.3)	1.000
Postoperative complications			
Pneumonia	1 (2.3)	0 (0)	1.000
Operative time of ERCP (min), mean ± SD	46.1 ± 20.7)	35.7 ± 14.7	0.009
Estimated blood loss of LC (ml), median ± IQR	54.8 ± 85.6	33.7 ± 55.0	0.185
Operative time of LC (min), mean ± SD	84.6 ± 26.4	96.3 ± 47.3	0.168
Post-LC LOS (days), mean ± SD	1.7 ± 1.2	3.9 ± 1.7	< 0.001
Post-ERCP LOS (days), mean ± SD	4.0 ± 0.9	3.9 ± 3.2	0.889
All LOS (days), mean ± SD	5.8 ± 1.5	7.9 ± 3.4	< 0.001
Delphi's Difficulty score (TG18), mean ± SD	6.8 ± 4.3	7.3 ± 4.1	0.587

ERCP: Endoscopic retrograde cholangiopancreatography, LOS Length of stay, CBD Common bile duct, Post-LC LOS Length of stay for LC, Post-ERCP LOS Length of stay for ERCP, Conversion Open conversion from LC

Table 3 Comparison of outcomes between early LC and delayed LC when controlling for the influence of Diabetes Mellitus

Outcomes	Adjusted beta difference	95% CI	p-value
Post-LC LOS (days), median difference	- 2.36	- 3.02, -1.71	< 0.001
Post-ERCP LOS (days)	- 0.09	- 1.11, 0.94	0.867
All LOS (days)	- 2.48	-3.62, -1.33	< 0.001
Bile leakage/CBD leakage, Bile duct injury*, risk difference	-2.44	-2.23, 7.16	0.311
Delphi's Difficulty score (TG18), mean difference	- 0.28	-2.15, 1.60	0.770

CBD Common bile duct, Post-LC LOS Length of stay for LC, Post-ERCP LOS Length of stay for ERCP, All LOS Post ERCP LOS and Post LC LOS *No control factors

Discussion

Our study results showed that early LC after ERCP had a significantly shorter length of stay compared to delayed LC. The results also demonstrated that early LC had lower rate of bile duct injury and intraoperative complication even though not statistically significant. Early LC group also had lower Delphi's difficulty score compared to delayed LC group but not statistically significant.

In terms of length of stay, our study showed that the early LC group had a significantly shorter overall length of stay, which aligns with findings from a meta-analysis indicating that LC

performed within 72 hours after ERCP resulted in approximately 0.354 days shorter LOS (95% CI: −0.845 to 0.136).[10] The shorter length of stay in the early LC group was associated with post-ERCP care occurring during the same period as preoperative LC preparation. In contrast, patients in the delayed group required several days of post-ERCP care and were typically readmitted one day prior to LC, which likely contributed to a longer overall length of stay.

For complication issues, there were evidences from many studies regarding ERCP prior to LC approach. Aziret et al. compared early post-ERCP LC following stone extraction and found it associated with reduced operation duration, fewer gallbladder fibrotic changes, and a decreased likelihood of complications. Consequently, LC could be safely conducted in the immediate post-ERCP period.[11] A meta-analysis revealed, LC after ERCP within 72 hours had about 0.354 (95% CI: −0.845, 0.136) days shorter LOS and lower overall complications (0.269 (95% CI :0.067, 1.073)) than LC after ERCP over 72 hours, but the difference was not statistically significant.[10] Moreover, Gao, et al found that, LC 1–3 days after ERCP could significantly reduce both serum and bile inflammatory reactions such as IL-6, high-sensitivity C-reactive protein, procalcitonin compared to LC 4-7 days after ERCP in chole-cysto-choledocholithiasis patients and could significantly reduce inflammatory bile reactions in chole-cysto-choledocholithiasis patients.

This finding exhibited correlate with the significantly lower incidence rates of angiocholitis and bile duct stricture in patients undergoing LC within 0–3 days compared to 4–7 days after ERCP (0% vs. 17.65%, p = 0.002), as well as recurrent stones (1.92% vs. 5.88%, p = 0.298) during a one-year follow-up period.[12]

According to our results, the early LC group had a lower complication rate compared with the delayed LC group, including bile duct injury (0% vs. 2.4%, p = 0.488) and colonic injury (0% vs. 4.9%, p = 0.235); however, these differences were not statistically significant. The lower complication rate may be attributed to reduced serum and bile inflammatory reactions[12], which lead to fewer fibrotic changes[11], supporting the findings of previous studies.

For patients with complicated choledocholithiasis, such as cholangitis and pancreatitis, evidence supported early LC. In mild biliary pancreatitis patients, same admission LC was recommended.[6] Da Costa DW et, al studied 136 patients with mild gallstone pancreatitis who underwent ERCP with sphincterotomy but not cholecystectomy, 14 cases (10%) were readmitted for biliary adverse events and 2 cases (1%) for recurrent pancreatitis.[13] The Tokyo Guidelines also recommend treating the underlying etiology at the same time as biliary drainage in patients with mild or

moderate choledocholithiasis/cholangitis.[8] This study had the strength of supporting findings from several previous studies comparing early and delayed laparoscopic cholecystectomy in patients with common bile duct stones, particularly regarding various clinical outcomes. Nonetheless, some limitations should be noted. The study had been refrained from drawing definitive conclusions, possibly due to multifactorial influences such as ethnic differences, varying age groups, resource availability across centers, and the relatively small sample size. A larger population could potentially yield more statistically significant results.

Clinical implication

This study's findings support the promising outcomes of performing early LC following ERCP in CBD stone patients, showing a significantly shorter overall hospital stay, no significant differences in terms of BDI outcomes and complications. These results could potentially influence clinical practice by advocating for earlier intervention in this patient population.

Based on the presented evidence, surgeons are encouraged to perform laparoscopic cholecystectomy within 72 hours following ERCP.

Conclusion

Early laparoscopic cholecystectomy, when performed after ERCP-induced stone extraction, is associated with a significantly shorter overall hospital stay and is therefore preferred when feasible.

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