Original Article

Early versus late lap cholecystectomy after endoscopic retrograde cholangiopan-creaticography for Chalcular cholecystitis and CBD stone

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ABSTRACT

Background: The optimum course of treatment for coexisting choledocholithiasis is endoscopic retrograde cholangiopan-creaticography (ERCP) followed by laparoscopic cholecystectomy (LC). The aim of our study is to compare the early versus late LC after ERCP clearance of CBD stone.

Patients and Methods: This study included 50 Patients with cholecyto – choledocholithiasis who were admitted to General Surgery Department of Al Zahar University Hospital during the period from March 2023 to March 2024. The mean operative time, intraoperative complications, hospital stay, postoperative complications, and conversion rates were compared between the two groups.

Results: Fifty patients divided into two equal groups, group A, with simultaneous ERCP and LC, and group B with LC at least 6–8 weeks after ERCP. The mean operative time in group A was shorter compared with group B with *P value* equal to 0006. hospital stay was shorter in group A compared to group B with *P value* equal to 0.001. However, group A had a statistically significant higher percentage of postoperative pancreatitis. The postoperative complication and conversion rates were almost identical in both the groups.

Conclusion: Performing single-session ERCP and LC is safe, effective, economically viable and associated with reduced frequency of imaging, and better patient satisfaction.

Key Words: Cholecyto–choledocholithiasis, decreased operative time and short hospital stay, endoscopic retrograde cholangiopan-creaticography, lap cholecyctectomy.

Received: 6 September 2024, **Accepted:** 27 September 2024, **Published:** 1 January 2025

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ISSN: 1110-1121, January 2025, Vol. 44, No. 1: 423-427, © The Egyptian Journal of Surgery

INTRODUCTION

The biliary system consists of the organs and ducts (bile ducts, gallbladder, and associated structures) that are involved in the production and transportation of bile[1].

Choledocholithiasis is the presence of gallstones in the common bile duct. This condition causes jaundice and liver damage due to obstruction of bile flow from the liver to the gall bladder and then to the small intestine, which may be either due to partial or complete obstruction of the extrahepatic biliary passages between the liver and duodenum, predominantly causing conjugated hyperbilirubinemia. This is a characteristic feature of obstructive jaundice[2].

The surgical treatment of biliary stone disease in the form of Cholecystectomy is the most effective and the only reliable method of elimination of the stones and the risk of stone recurrence[3].

Laparoscopic cholecystectomy (LC) started in 1987. It rapidly replaced open cholecystectomy (OC) as the standard treatment. Advantages of LC include reduced hospitalization, decreased morbidity, short recovery time, and better cosmesis. However, compared with OC, the incidence of injuries to the bile duct seems to be increased[4].

Endoscopic retrograde cholangiopan-creatography (ERCP) is one of the modalities used in management of biliary tree stones. It is a technique that combines the use of endoscopy and fluoroscopy to diagnose and treat certain problems of the biliary or pancreatic ductal systems[5].

This study aims to compare early versus late LC after ERCP clearance of CBD stone in patients with calcular obstructive jaundice from a socioeconomic point of view in the form of operative time, conversion rate, intra and postoperative complications, hospital stay which in the end affect the total cost of the operation.

PATIENTS AND METHODS:

Fifty patients were included and classified into two groups: group A early: (25 cases underwent simultaneous ERCP clearance of CBD and LC) and group B late: (25

DOI: 10.21608/EJSUR.2024.318865.1195

cases underwent LC at least 6–8 weeks after ERCP). This study was done in the department of Surgery and GIT endoscopy unit, Al Zahar University Hospital from March 2023 to March 2024.

The ethics committee of the department and college approved our study. A written informed consent was obtained from the patients. All collected data was for research purposes only.

Inclusion criteria: Males and females at or above the age of 20 years old and below the age of 60 years old with cholecyto–choledocholithiasis, history of obstructive jaundice, dilated CBD (gamma glutamyl transferase), CBD stone, elevated serum bilirubin, GGT (gamma glutamyl transferase) or alkaline phosphatase level.

Exclusion criteria: Acute cholecystitis, pancreatitis, cholangitis, liver cirrhosis, Contrast agent allergies, and Patient who had a cholecystectomy, gastric operation, or stent during a procedure outside our hospital.

Preoperative evaluation

All patients underwent complete history taking, clinical examination, and routine investigations.

Surgical technique: ERCP was done first. All patients were in the left lateral position under sedation or general anesthesia. a side-view duodenoscope was inserted through the mouth, down the esophagus, into the stomach, through the pylorus into the duodenum where the ampulla of Vater, a plastic catheter or cannula was inserted through the ampulla. (Fig. 1). Radiocontrast was injected into the bile ducts, and fluoroscopy was used to look for blockages, dilatation, stricture, or filling defects. (Fig. 2).

Sphincterotomy was done with an electrified wire, and access into the bile duct was obtained so that gallstones were removed by sweeping of CBD with a basket or balloon to remove gall stones, (Fig. 3). A plastic stent was optionally inserted to assist in the drainage of bile.

The position of the patient was changed to supine position for LC; First trocar was placed supra or infra umbilical by open method visiport, Pneumoperitoneum was created by Co_2, and then abdominal exploration was performed for any evident abnormalities, The other ports were inserted under visualization using the laparoscope (10 mm epigastric port, 5 mm right lateral subcostal position, 5 mm right subcostal mid-clavicular line position), as shown in (Fig. 4). The patient was placed in the Reverse Trendelenburg position slightly rotated to the left, the gall bladder was identified, the fundus was grasped and retracted up by a grasper through the right lower 5 mm port to expose the whole gallbladder, the infundibulum of the gallbladder was retracted in a caudolateral direction, the cystic duct and the triangle of Calot to obtain the critical view was identified (Figs 5), 2 distal clips and 1 proximal clip were placed along the cystic duct, the cystic duct was divided, making sure both jaws are visible to prevent vascular injury, 1 proximal clip was placed along the cystic artery, any necessary collateral arteries was divided and cauterized, the posterior wall of the gall bladder was dissected using an L- Hook, the gallbladder was removed via umbilical trocar Irrigation and Suction, tube drain was inserted in the liver bed, CO_2 was released, trocar incisions was sutured.

Fig. 1: Cannulation of the papilla.

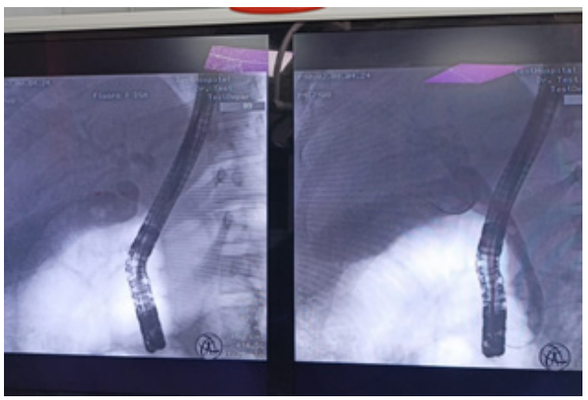

Fig. 2: Injection of radiocontrast, identification of multiple filling defects in CBD and gall bladder.

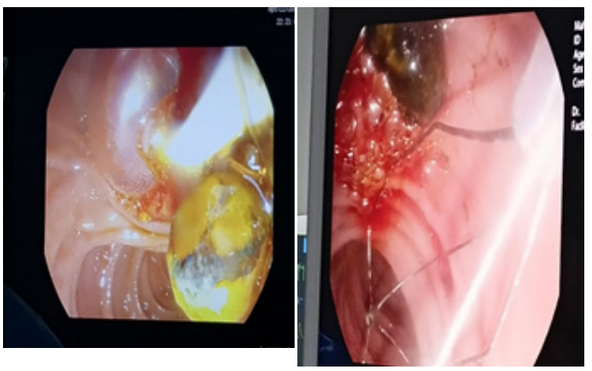

Fig. 3: Stone extraction by sweeping of CBD by balloon extractor and dormie basket.

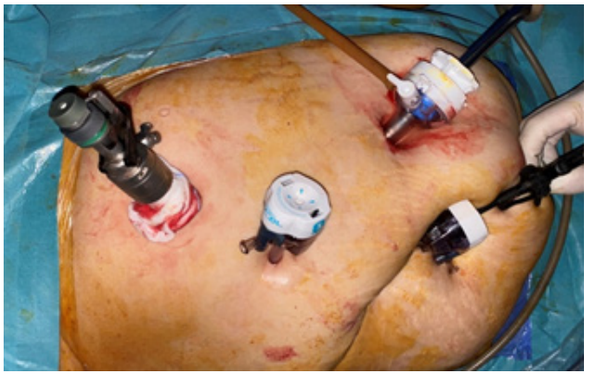

Fig. 4: Insertion of different ports.

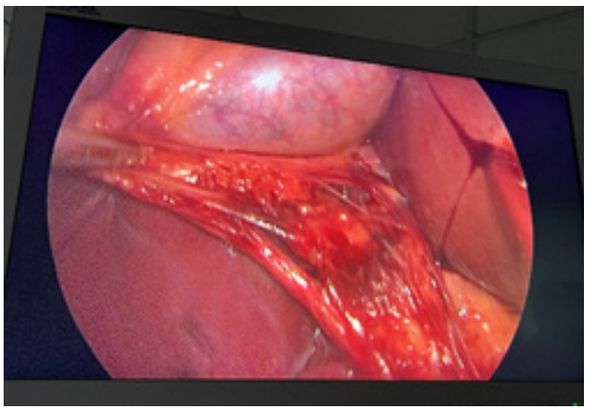

Fig. 5: Identify callot triangle, cystic duct, and artery.

Postoperative follow-up

All patients were monitored for 4–6 h, full labs were done the day after, especially amylase and lipase to exclude postoperative pancreatitis, and the patients were discharged home after 1–2 days if no complications occurred. If any complications occurred, they were managed according to the patient's status. The minimum length of hospital stay is 1–2 days, and the maximum length is 5 days.

RESULTS:

The ages of the patients in the study ranged between 20 and 60 years with a mean and standard deviation (SD) of 43.2±9.6 years in the early group, and 46.2±7.3 in the late group. And for their sex, in the early group, there were three (12%) males and 22 (88%) females while in the late group, there were eight (32%) males and 17 (68%) females.

There was a significant difference between groups A and B regarding operative time, with the early group (group A) having a shorter mean operative time of 80±20.4, (range: 20–120 min) compared with the late group (group B), which had a mean operative time of 98.6±24.7 (range: 50–145 min) as shown in (Table 1).

There were no statistical differences between the two study groups regarding age, sex, clinical picture, and ultrasound parameters on admission as obstructive jaundice or biliary colic, common bile duct stones or diameters, liver enzyme level, need for stent placement, and conversion rate to open surgery.

There were no significant differences between group A and B cases regarding intraoperative complications. For adhesion, there was one (4%) patient with adhesion in the early group versus three (12%) patients in the late group. For bleeding, there was one (4%) patient with bleeding in the early group versus three (12%) patients in the late group. For distension, there was one (4%) patient with distension in the early group versus 0 (0%) patients in the late group. For contracted GB, there was one (4%) patient with contracted GB in the early group versus three (12%) patients in the late group as shown in (Table 2).

Regarding postoperative complications, the Early group had a statistically significant higher percentage of post-operative pancreatitis; five (20%) patients compared with the late group, which had 0 (0%) patients; Four of those five patients improved within 3 days and one patient needed ICU admission for 4 days. On the other hand, no differences were noted between the two groups regarding other postoperative complications such as bile leak, wound infection, and postoperative bleeding as shown in (Table 3).

There was a statistically significant difference between group A and group B regarding postoperative hospital stay, with the early group (group A) having a shorter stay (range: 1–2 days) compared with the late group (group B), which had a stay of 2–3 days, as shown in (Table 4).

Table 1: Operative time of the study

	Group A (Early)	Group B (Late)		
Operative time	*N*=25	*N*=25	*P* value	Significance
Mean±SD	80±20.4	98±24.7	0.0006	S

Table 2: Description and Comparison between both study groups regarding intraoperative complications

	Lap cholecystectomy					
	Early (*N*=25) %		Late (*N*=25) %		X^2	*P* value
Adhesion						
No	24	96	22	88	1.08	0.297 NS
Yes	1	4	3	12		
Bleeding						
No	24	96	22	88	1.08	0.297 NS
Yes	1	4	3	12		
Distension						
No	24	96	25	100	1.02	0.312 NS
Yes	1	4	0	0		
Contracted GB						
No	24	96	22	88	1.08	0.297 NS
Yes	1	4	3	12		

Table 3: The result of postoperative complications between the two studied groups

	Lap cholecystectomy					
	Early (*N*=25) %		Late (*N*=25) %		X^2	*P* value
Pancreatitis						
No	20	80	25	100	**5.5**	**0.018 S**
Yes	5	20	0	0		
Bile leak						
No	25	100	24	96	1.02	0.312 NS
Yes	0	0	1	4		
Bleeding						
No	24	96	23	92	0.35	0.552 NS
Yes	1	4	2	8		
Wound infection						
No	24	96	22	88	1.08	0.297 NS
Yes	1	4	3	12		

Table 4: Postoperative hospital stays data distribution in the study

	Group A (early)	Group B (late)			
Hospital stay	*N*=25	*N*=25	Test value	*P* value	Significance
Mean±SD	1.76±0.4	2.16±0.4	3.4	0.001	S

DISCUSSION

The time interval between our studying groups was; group A (simultaneous ERCP and LC within the same setting till 48 hours) and Group B (LC 6-8 weeks after ERCP), while Qi *et al*.[6] considered early (≤3 days), delayed LC (>3 days) following ERCP, Mohamed *et al*.[7] considered early in the same setting and late within (1–3 weeks) and Mallick *et al*.[8] consider late procedure within 30 days.

In our study the mean operative time was 80±20.4 min in the early group and 98.6±24.7 in the late group, as adhesions and bleeding were more in the late group, with a *P value* of 0.0006, which was statistically significant, Qi *et al*.[6] and Mohamed *et al*.,[7] showed that the operative time was significantly shorter in the early group if compared with late group and this similar to our study.

We noted no differences between both study groups regarding conversion rate to open surgery. This observation agreed with Zhang *et al*.,[9] while

Mohamed *et al*.[7], Qi *et al*.[6], and Friis *et al*.[10] found that there was a significant difference.

As regards to intra operative complications, there was no statistically significant difference between our study groups which agreed with the observation made by Zhang *et al*.,[9] except for intraoperative bleeding.

Mohamed *et al*.[7] found that the statistical difference between both study groups was not significant concerning bleeding but significant for adhesion.

It was observed that five (20%) patients in the early group had developed postoperative pancreatitis compared with the late group 0 (0%) patients and this finding was statistically significant. Qian *et al*.[11] reported that early procedures can effectively reduce the incidence of postoperative pancreatitis. On the other hand, no differences were noted between the study groups regarding other postoperative complications such as bile leak, wound infection, and postperative bleeding.

Mean hospital stay in our study was 1.76±04 and 2.16±0.4 days in the early and the late groups respectively due to fewer postoperative complications in the early group, this finding was statistically significant, and this agreed with the observation made by Qian *et al*.[11], Zang *et al*.[12] and Mallick *et al*.[8].

CONCLUSION

From our study we can conclude that early LC after ERCP in patients with calculous cholecystitis and common bile duct stone was associated with shorter operative time and hospital stay, reducing operative cost. However, this early intervention is associated with a higher incidence of postoperative pancreatitis.

Also, performing single-session ERCP and LC is safe, effective, economically viable, and associated with reduced imaging frequency, and better patient satisfaction.

CONFLICT OF INTEREST

There are no conflicts of interest.

REFERENCES

1. Keplinger K, Bloomston M. Anatomy and embryology of the biliary tract. Surg Clin 2014; 94:203–217.

2. Vagholkar K. Obstructive jaundice: Understanding the pathophysiology. International J Surg Med 2020; 6:26–31.

3. Gutt C, Schläfer S, Lammert F. The treatment of gallstone disease. Deutsches Ärzteblatt International 2020; 117:148–156.

4. Abhishek B, Hari S, Gajanan W. A clinical study to determine predictive factors for difficult laparoscopic cholecystectomy. Int J of Surg 2020; 4:126–132.

5. Ibrahim Z H. Early versus late laparoscopic cholecystectomy after ERCP. AAMJ 2010; 8:121–187.

6. Qi S, Xu J, Yan C, *et al*. Early versus delayed laparoscopic cholecystectomy after endoscopic retrograde cholangiopancreatography: A meta-analysis. Med 2023; 102:34884.

7. Mohamed MA, Gaber A, Saada A, *et al*. Single-session endoscopic retrograde cholangiopancreatography (ERCP) and laparoscopic cholecystectomy (LC) vs. Two-stage Endoscopic Stone Extraction during ERCP followed by LC: a multicenter experience. Egypt J Surg 2023; 42:603–609.

8. Mallick R, Rank K, Ronstrom C, *et al*. Single-session laparoscopic cholecystectomy and ERCP: a valid option for the management of choledocholithiasis. Gastrointestinal endoscopy 2016; 84:639–45.

9. Zhang M, Hu W, Wu M, *et al*. Timing of early laparoscopic cholecystectomy after endoscopic retrograde cholangiopancreatography. Laparoscopic, Endoscopic and Robotic Surg 2020; 3:39–42.

10. Friis C, Rothman J P, Burcharth J, *et al*. Optimal timing for laparoscopic cholecystectomy after endoscopic retrograde cholangiopancreatography: a systematic review. Scandinavian J Surg 2018; 107:99–106.

11. Qian Y, Xie J, Jiang P, *et al*. Laparoendoscopic rendezvous versus ERCP followed by laparoscopic cholecystectomy for the management of cholecysto-choledocholithiasis: a retrospectively cohort study. Surg Endosc 2019; 34:2483–9.

12. Zang J, Zhang C, Gao J, *et al*. Endoscopic retrograde cholangiopancreatography and laparoscopic cholecystectomy during the same session: feasibility and safety. World J Gastroenterol: WJG 2013; 19:6093.