

# EARLY VERSUS LATE LAPAROSCOPIC CHOLECYSTECTOMY POST ERCP IN PATIENT WITH CHOLEDOCHOLITHIASIS

By

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## ABSTRACT

**Background:** Ten to fifteen percent of all patients with gall bladder stones presented with CBD stones. Endoscopic Retrograde Cholangiopancreatography (ERCP) is one of the modalities used in biliary tree stones. Many studies revealed that this protocol particularly prior to laparoscopic cholecystectomy (LC). The time interval-between ERCP and LC is a matter of debate.

**Objective:** To evaluate the safety of early over late laparoscopic cholecystectomy post ERCP in patients with choledochocystolithiasis.

**Patients and Methods:** This prospective randomized study was carried out from May 2020 to October 2020 at the Department of General Surgery Al-Azhar University Hospitals, Cairo, Egypt. It included 40 adult patients with cholelithiasis and a possibility of choledocholithiasis who underwent ERCP. ERCP patients were classified into two equal groups: Early group in whom LC was done immediately after ERCP, and Late group in whom LC was done after 4 weeks. Comparison was applied between the two groups.

**Results:** This study clearly revealed that performing immediate LC post, ERCP in comparison to delayed LC after ERCP had better outcome. It had the lower conversion rate, less operative time, shorter hospital stay, and less postoperative complications. The comparison between two groups revealed that immediate LC post ERCP had the upper hand of the advantages and the least disadvantages rather than the other group.

**Conclusion:** Early LC after ERCP was considered as an adopted policy in the management of the patient with calcular obstructive jaundice.

**Keywords:** Obstructive jaundice, ERCP, laparoscopic cholecystectomy.

## INTRODUCTION

Approximately 10% to 20% of patients undergoing cholecystectomy for cholelithiasis have coexisting common bile duct stones (CBDS). The current standard of treatment for calcular obstructive jaundice is endoscopic removal of the stones.

Endoscopic sphincterotomy (ES) is widely accepted as a treatment of choice for patients with CBDS. Stone extraction is successful in up to 97% of patients after endoscopic removal of bile duct stones (*Collins et al., 2014*).

Many authors contend that endoscopic management of bile duct stones with gallbladder left in situ is definitive

treatment. However, retrospective and prospective series have suggested that further biliary complications occur in more than 24% of patients after varying periods of follow-up, and the rate of subsequent cholecystectomy is high. So the optimal management of choledocholithiasis has to be by safe and cost-effective. Patients with combined choledochocystolithiasis requires treatment of both bile duct stones and gallbladder stones. Several approaches are available endoscopic removal of bile duct stones (pre-, per-, postoperatively) together with cholecystectomy (*Perissat et al., 2019*).

In many Western countries, standard treatment consists of postoperative endoscopic sphincterotomy (ES) followed by laparoscopic cholecystectomy (LC). Patients with choledochocystolithiasis generally undergo endoscopic sphincterotomy (ES) followed by laparoscopic cholecystectomy (LC). However, many patients receive this surgery 6-8 weeks after ES. There is a high conversion rate of elective laparoscopic cholecystectomy (LC) after endoscopic sphincterotomy (ES) and patients can develop recurrent biliary events during the waiting period (*Nathanson et al., 2015*).

Endoscopic Retrograde Cholangiopancreatography (ERCP) is one of the modalities used in management of biliary tree stones (*Nathanson et al., 2015*).

National and international studies revealed that this procedure is safe particularly prior to laparoscopic cholecystectomy (LC), while other studies pointed out that ERCP followed by

immediate laparoscopic cholecystectomy could decrease the risk of cholangitis and recurrent pancreatitis (*Vivian McAlister et al., 2017*).

**The present work aimed to** evaluate the safety of immediate over delayed laparoscopic cholecystectomy post ERCP in patients with choledochocystolithiasis.

## PATIENTS AND METHODS

This prospective randomized study was carried out from May 2020 to October 2020 at the Department of General Surgery, Al-Azhar University Hospitals, Egypt. It included 40 adult patients with cholelithiasis and a possibility of choledocholithiasis who underwent after ERCP. All patients were subjected to complete evaluation through detailed history, complete physical examination, laboratory investigations and imaging study (US and/or MRCP). Randomization was done using computer-generated random number sequences in concealed enveloped with block randomization design.

ERCP was performed to all patients under general anesthesia. CBD stones were found on endoscopic cholangiography performed, and the stones were extracted using either dormia basket or balloon catheter Mechanical lithotripsy was done in cases of large stones. Occlusion cholangiography was done at the end of every ERCP to ensure that no missed stones. After ERCP, patients were classified into two equal groups. Early group in whom LC was done immediately after ERCP, and Late group in whom LC was done after 4 weeks. LC was done in all patients by the same surgical team using the standard 4

port technique. The operative time was calculated from the start of the incision until placement of the last suture. The outcome and complications of ERCP and LC, the rate of conversion to an open procedure, operative time, hospital stay and mortality were recorded. Hospital stay included all periods of admission for ERCP, LC and recurrent biliary symptoms. All patients were followed up at 3 and 6 months, and were 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 (%). Student's test was used to test significance of difference for quantitative variables, while Chi square was used to test significance of difference for qualitative variables. A probability values (p-value) <0.05 was considered statistically significant.

**RESULTS**

There was no statistical significant difference (p-value > 0.05) between studied groups as regard CBD stone (s), and statistically significant difference (p-

value < 0.05) between studied groups as regards dilated CBD, and operative time (**Table1**).

**Table(1): Comparison between studied groups as regard U/S findings**

Parameters	Groups	Immediate (N = 20)		Delayed (N = 20)		P-value
	No	Yes	No	Yes		
Dilated CBD	No	3	15%	9	45%	0.038
	Yes	17	85%	11	65%	
CBD stone	No	2	10%	3	15%	> 0.05
	Yes	18	90%	17	85%	
Operative time (min) (Mean ± SD)		48.5 +5.9		77.3 +8.6		< 0.001

No statistical significant difference (p-value > 0.05) between studied groups as regard post-operative complications

bleeding, bile leak and wound infection (**Table 2**).

**Table (2): Comparison between studied groups as regard post-operative complications**

Parameters	Groups	Immediate (N = 20)		Delayed (N = 20)		P-value
	No	Yes	No	Yes		
Bleeding	No	20	100%	20	100%	1
	Yes	0	0%	0	0%	
Bile leak	No	20	100%	19	95%	>0.05
	Yes	0	0%	1	5%	
Wound infection	No	20	100%	18	90%	>0.05
	Yes	0	0%	2	10%	

## DISCUSSION

Biliary stones occur in all societies and races in young and old people of both sexes, and in all states of health. They are, however increasingly prevalent with age and three times more common in females (*Nathanson et al., 2015*).

For those symptomatic patients with gallstone related problems confined to the gall bladder the aim of treatment should be elimination of the stones and of the risk of stone recurrence. Cholecystectomy is the most cost effective and the only reliable method of achieving. Possibly, the timing of LC after ES may have an influence on the difficulty of surgery. Many surgeons believe that surgery is safer several weeks after ES (*Salman et al., 2019*).

In this study, we have evaluated two different approaches (ERCP followed by LC immediately, versus ERCP followed by LC after 4 weeks). The base line differences in our work (age, sex, abnormal liver function tests and US findings) were not statistically significant. Our results showed that patients who underwent immediate LC after ERCP have significantly lower conversion rate to open cholecystectomy when compared to patients who underwent delayed LC (zero% Vs 21.8%). This was in agreement with *Salman et al. (2019)* who conducted randomized trial to compare patients who were operated between 24 and 72 hours after ERCP and those who were operated more than 72 hours after ERCP. Also, *El Labban et al. (2011)* found that patients who underwent LC within 72 hours after ERCP have significantly lower conversion rate to open cholecystectomy compared to those patients who underwent LC after 4

weeks. *DeVries (2015)* stated that a significant higher conversion rate was encountered when LC performed 4 weeks after ES. There were studies that showed few technical problems or complications resulting from the presence of the inflamed bowels when LC was performed immediately after ERCP. The main causes for conversion in our study were including dense adhesions, unclear anatomy and bleeding.

In our study, the operative time and post-operative hospital stay were longer in the delayed group compared to immediate group which statistically significant, and this came in accordance the results of (*El Labban et al., 2011*).

The reasons of longer operative time were scarring and fibrosis of the biliary tree and Calot's triangle while longer hospital stay was explained by the higher percentage of conversion rate, the more encountered postoperative complications. As regard complication, we noticed that the prolonged hospital stay include wound infection, most of the complications occur in the duct in the form of recurrent biliary symptoms, biliary colic, cholecystitis.

Six patients in the delayed group developed acute pancreatitis who needed prolonged hospital stay with successful conservative treatment

Early LC after ES may prevent recurrent biliary colic which occurred during the waiting period and associated with increased postoperative morbidity and prolonged hospital stay (*Anandi et al. 2018*). However several authors did not justify the routine use of LC after endoscopic clearance of CBD (*Schreurs et al., 2014* and *Suegiyama et al., 2014*) and preferred to reserve it only for patients

experiencing untreatable, recurrent biliary symptoms or acute cholecystitis the concept for this is that ES alone, besides treating choledocholithiasis may prevent (or decrease) biliary complaints in a good number of cases (*Pereira- Lima et al. 2018*).

In our present study, the incidence of recurrent biliary symptoms were significantly higher in the delayed group (27.2%) compared to the immediate group (0%). As regard the postoperative complications, they were minor and treated with conservative treatment with no statistical significance between the groups there was no mortalities.

## CONCLUSION

Performing immediate LC post, ERCP in comparison to delayed LC after ERCP had better outcome. It had the lower conversion rate, less operative time, shorter hospital stay, and less postoperative complications. The comparison between two groups revealed that immediate LC post ERCP had the upper hand of the advantages remembered above and the least disadvantages rather than the other group.

## REFERENCES

- Anandi H, Marc G, Djamila B, Robin T and Marinus J. (2018):** Timing of cholecystectomy after endoscopic sphincterotomy common bile duct stones. *AM.J. Surg. Endosc.*, 12(15):512-517
- Collins C, Maguire D, Ireland A, Fitzgerald E and O'Sullivan GC. (2014):** A prospective study of common bile duct calculi in patients undergoing laparoscopic cholecystectomy: natural history of choledocholithiasis revisited. *J. Ann Surge*, 28(32):214-255
- De Vries A, Donkervoort SC and van Geloven S. (2015):** Conversion rate of laparoscopic cholecystectomy after retrograde cholangiography in the treatment of cholecystitis. *AM.J. Surg. Endosc.*, 13(12):560-566
- El Labban G., Emad H., Mohamed A., Nader E. and Mohamed A. (2011):** The effect of time interval between endoscopic retrograde cholangiopancreatography and laparoscopic cholecystectomy. *Egy J Surge.*, 30(2):28-33.
- Nathanson N., O'Rourke k. and Martin L. (2015):** ERCP versus laparoscopic choledocotomy for selected bile duct calculi: a randomized trial. *Ana Su*, 12(5):188-192.
- Pereira J., Jakobs R., Winter U. and Benz C. (2018):** Long-term results (7 to 10 years) of endoscopic papillotomy for choledocholithiasis: multivariate analysis of prognostic factors for the recurrence of biliary symptoms. *Am. J.Gastrointest Endosc.*, 48(15):457-64.
- Perissat J., Huibregtse K., Keane F. and Russel R. (2019):** Neoptolemos JP. Management of bile duct stone in the era of Laparoscopic cholecystectomy. *Br J Surgery*, 81(15):799-1810.
- Salman B, Yilmaz U, Kerem M and Bedirli A (2019):** The timing of laparoscopic cholecystectomy after endoscopic retrograde cholangiopancreatography in cholelithiasis coexisting with choledocholithiasis. *J Hepatobiliary Pancreat Surgery*, 16(25):832-860.
- Schreurs W, Vles W, Stuijbergen W and Ostvogel H. (2014):** Endoscopic management of common bile duct stones leaving the gallbladder in situ: a cohort study with longterm follow-up. *Dig Surgery*, 21(19):60-94.
- Sugiyama M, Suzuki Y, Abe N and Masaki T. (2014):** Endoscopic re-treatment of recurrent choledocholithiasis after sphincterotomy. *Gut*, 51(1): 856-911.
- Vivian M., Eric D., and Elizabeth R. (2017):** Cholecystectomy Deferral in Patients with Endoscopic Sphincterotomy. *Cochrane Database of Systematic Reviews*, 4(14):22-55.

## مقارنة الإستئصال المبكر للمرارة مقابل الاستئصال اللاحق بمنظار البطن الجراحي بعد عمل منظار القنوات المرارية والبنكرياس في المرضى الذين يعانون من الإنسداد الحصوي للقنوات المرارية المشتركة

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**خلفية البحث:** يعتبر المنظار المراري واحداً من أهم طرق علاج حصوات القنوات المرارية. وقد أثبتت كثير من الدراسات أنه آمن وخاصة قبل إستئصال المرارة بالمنظار الجراحي ولكن بعض الدراسات أثبتت أفضلية إستئصال المرارة بالمنظار الجراحي عقب المنظار المراري مباشرة. وكثير من الدراسات أثبتت أن نسبة من المرضى الذين يتم إستئصال المرارة بعد فترة زمنية من عمل المنظار المراري يعانون من تكرار الأعراض والتهابات البنكرياس والقنوات المرارية، ولهذا تأتي أهمية الفترة الزمنية بعد عمل المنظار المراري وإستئصال المرارة بالمنظار الجراحي وهي موضع إختلاف بين الدراسات من حيث مضاعفات بين العملية وتكرار تكون حصوات بالقنوات المرارية.

**الهدف من البحث:** تقييم تأثير الفترة الزمنية بين عمل المنظار المراري واستئصال المرارة بالمنظار الجراحي في المرضى الذين يعانون من حصوات بالقنوات المرارية والمرارة معاً.

**المرضى وطرق البحث:** أجريت هذه الدراسة في مستشفيات جامعة الأزهر بالقاهرة، قسم الجراحه العامه، في الفترة من مايو 2020 حتى أكتوبر 2020 على 40 مريضاً. وأدرج في هذه الدراسة كل المرضى الذين يشكون من مشاكل الحصوات بالقنوات المراريه والحوصله المراريه وقد تم تقسيم المرضى الي مجموعتين متساوتين:

**الأولى:** المرضى الذين تم إستئصال المرارة بالمنظار الجراحي عقب استخدام المنظار المراري.

**الثانية:** المرضى الذين تم إستئصال المرارة بالمنظار الجراحي لهم بعد 4 أسابيع من عمل المنظار المراري.

**نتائج البحث:** بالمقارنة بين المجموعتين تبين أن مدة الجراحة أقل في المجموعة الاولى مقارنة بالمجموعة الثانية, و معدل التحول من المنظار الجراحي الى الجراحة المفتوحة كان 0% في المجموعة الاولى و 21.8% في المجموعة الثانية. وكانت مدة الإقامة بالمستشفى أقل في المجموعة الاولى مقارنة بالمجموعة الثانية, كما أن مضاعفات ما بعد العملية أقل في المجموعة الاولى مقارنة بالمجموعة الثانية.

**الاستنتاج:** أثبتت الدراسة أفضلية إزالة المرارة بالمنظار مباشرة وعقب استخدام المنظار المراري من حيث النتائج والمضاعفات بعد العملية وزمن التدخل الجراحي ومعدل التحول من المنظار الجراحي إلي الجراحة المفتوحة وهذا يشجع علي استخدام هذا النهج في التعامل مع حالات حصوات القنوات المرارية والحوصلة المرارية.

**الكلمات الدالة:** صفراء إنسدادية, منظار مراري, إستئصال المرارة بالمنظار.