LAPAROSCOPIC TRANSCYSTIC COMMON BILE DUCT EXPLORATION FOR CHOLEDOCHOLITHIASIS: A SINGLE SURGEON EXPERIENCE

Joon Kim MD[a], Peter Collings MD[a], Eric Weiler, MD[a], David Broadbent, PhD[b], Lewis Rashid, MD FACS[a]

a. University of Michigan Health-Sparrow Hospital, b. Michigan State University College of Medicine

Department of Surgery
College of Human Medicine
MICHIGAN STATE UNIVERSITY

BACKGROUND

This study compares various outcomes between two strategies to treat choledocholithiasis: (1) laparoscopic transcystic common bile duct exploration (LTCBDE) with concurrent cholecystectomy vs. (2) endoscopic retrograde cholangiopancreatography and subsequent laparoscopic cholecystectomy (ERCP+LC).

ERCP before or after cholecystectomy is an accepted treatment for choledocholithiasis. However, this method subjects patients to two procedures under anesthesia, potentially adding to cost and length of stay. Additionally, ERCP has its own risks, such as pancreatitis.[1] Alternatively, cholecystectomy and LTCBDE can be done in one procedure, using either blind techniques (Fogarty, basket) or biliary endoscopy, which can be done with a flexible ureteroscope or a choledochoscope.[2]

We hypothesized that hospital length of stay is reduced with LTCBDE with biliary endoscopy versus ERCP+LC.

METHODS & PROCEDURES

We performed a retrospective cohort study of a single surgeon's outcomes using LTCBDE to treat patients with clinical or radiographic evidence of choledocholithiasis. For comparison, we used a group of patients managed with ERCP+LC.

Hospital length-of-stay was the primary quantitative outcome. Other outcomes included stone clearance rate (based on completion cholangiogram), MRCP rate, post-procedure pancreatitis rate, and procedure cost. We also collected demographics, lab values, imaging characteristics, and presence of gallstone pancreatitis or cholangitis for descriptive analysis. Given the lack of randomization, we used propensity score matching to estimate the treatment effect.

Techniques for transcystic stone removal
- *Fogarty balloon catheter with fluoroscopy*
- *Basket retrieval with fluoroscopy*
- ***Basket retrieval with biliary endoscopy***

Factors assoc. with failure of LTCBDE
- *Stones > 6 mm*
- *Intrahepatic stones*
- *Cystic duct diameter < 4 mm*
- *Cystic duct entrance to CBD posterior or distal (as opposed to lateral)*

Fig. 1: LTCBDE techniques and success factors [1]

	LTCBDE	ERCP+LC
Length of stay (mean, days)	4	7
Stone clearance	10/14	13/14
MRCP	1/14	5/14

Table 1: primary and selected secondary outcomes.

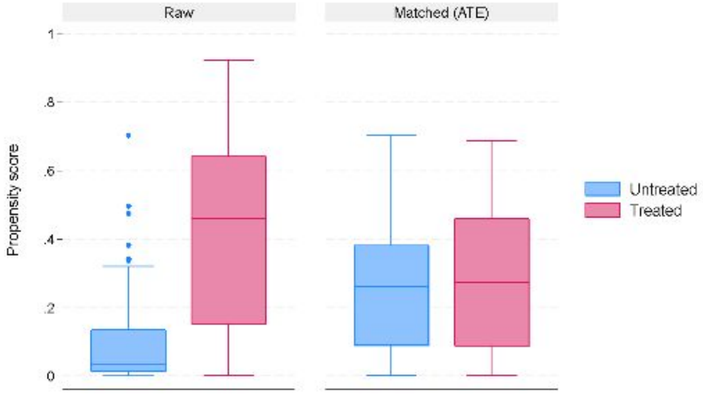


Figure 2: Propensity Score Diagram

RESULTS

We identified 24 LTCBDE cases. Fourteen cases were included in the final analysis for comparison after propensity score matching.

Length-of-stay was shorter in the LTCBDE group than in the comparison group (mean difference [MD]: -1.5 days, p=0.042).

Stone clearance success rate was 71.4% (10/14) in the LTCBDE group and 92.8% (13/14) in the ERCP+LC group.

Preoperative MRCP was obtained in 7% (1/14) of patients in the LTCBDE group and 35% (5/14) of patients in the ERCP+LC group.

DISCUSSION

These findings support our hypothesis that LTCBDE to manage choledocholithiasis is associated with a shorter hospital length-of-stay compared to ERCP+LC. Also, LTCBDE required more MRCPs. Stone clearance rate was higher in the ERCP+LC group, but MRCP was ordered more in this group as well. When LTCBDE is unsuccessful, this generally necessitates an ERCP.

These findings suggest LTCBDE could reduce hospital resource use and patient time. On the other hand, more research is needed to see how these outcomes might offset each other.

Significant limitations to our study include limited sample size, lack of randomization, and single-surgeon, single facility data.

REFERENCES

1. Zerey M, Haggerty S, Richardson W, Santos B, Fanelli R, Brunt LM, Stefanidis D. Laparoscopic common bile duct exploration. Surg Endosc. 2018 Jun;32(6):2603-2612. doi: 10.1007/s00464-017-5991-1. Epub 2017 Dec 22. PMID: 29273878.
2. A Boston Scientific Spyglass™ Discover is a commercially available single-use choledochoscope. All LTCBDE cases in this study were performed using the Spyglass device. The authors have no affiliation with Boston Scientific and have no disclosures.