Case Report

DOI: 10.7860/JCDR/2021/49296.15179

Surgery Section

Laparoscopic Common Bile Duct Exploration as a Rescue Procedure for Failed Endoscopic Retrograde Cholangio-Pancreatography: A Case Report

UMAR RIAZ[1], ABHIJIT S JOSHI[2]

ABSTRACT

Across the world, choledocholithiasis is presently treated by a two staged approach of Endoscopic Retrograde Cholangio-Pancreatography (ERCP) followed by Laparoscopic Cholecystectomy (LC); in a vast majority of the situations. Modern day literature abounds with comparative outcomes studies between ERCP and Laparoscopic Common Bile Duct Exploration (LCBDE), as therapeutic modalities for Common Bile Duct (CBD) stones. There are strong arguments both in favour and against both these treatment options, in literature. As per literature, the advantage of LCBDE is that it is a single stage procedure, but requires advanced laparoscopic expertise and a choledochoscope in the setup. The advantage of ERCP is that it is a highly standardised procedure. In expert hands and well equipped setups, it rarely ever fails to deliver. However, ERCP is also a highly operator dependant procedure. Also, in the best of hands, sometimes, local factors such as abnormal anatomy, stone morphology can lead to failures or suboptimal results. As per literature, ERCP to extract CBD stones can fail for various reasons such as failed cannulation, previous Billroth II gastrectomy, large CBD stones, large number of CBD stones etc. The failure in retrieving CBD stones by ERCP is an absolute indication for performing CBDE. Here, authors present a case report of a 73-year-old male with failed ERCP (inspite of two attempts) due to a large, solitary but tightly impacted terminal CBD stone. It hopes to convey the message that in similar situations, LCBDE, tactically using some endoscopy accessories, is a sound backup therapeautic option, inspite of non availability of a choledochoscope in the setup. The novelty of this case was that instead of the standard use of choledochoscope to directly visually confirm the completeness of stone clearance during the LCBDE, intraoperative fluoroscopy has been used effectively for the same; by obtaining good quality proximal and distal occlusion cholangiograms at the end of the procedure.

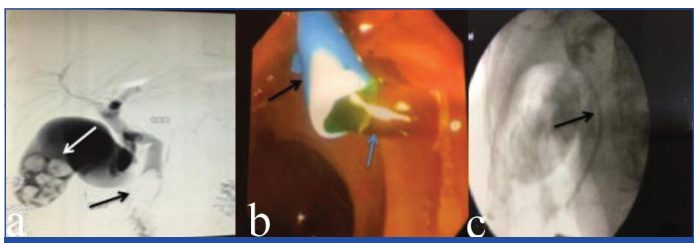
Keywords: Choledocholithiasis, Magnetic resonance cholangio-pancreaticography, Trans-cystic cholangiogram

CASE REPORT

A 73-year-old male presented to the Emergency Department with a 24 hours history of acute right upper quadrant and epigastric pain associated with nausea and vomiting. The pain was colicky in nature and was radiating to the upper mid back. Oral feeds seemed to precipitate and aggravate the pain and there were no particular relieving factors. He had no past medical history and was not on any medications. He had similar pain in the past, around one month back, precipitated by oral consumption of fatty foods. On examination, his pulse rate was 110 beats/minute, blood pressure was 120/80 mm of Hg and respiratory rate was 20 breaths/minute. He had icterus and had noted dark yellow coloured urine since 3-4 days. Per abdomen examination revealed tenderness in the right hypochondriac region, to deep palpation.

Laboratory tests revealed a haemoglobin of 10 grams/dL, total leukocyte count-12000/cu.mm., total bilirubin was 4 mg/dL, direct bilirubin was 3 mg/dL, serum alkaline phosphatase-350 IU/L, serum gamma glutamyl transpeptidase was 330 units/L, serum aspartate transaminase-300 units/L, serum alanine transaminase was 280 IU/L, serum amylase was 100 U/L. A urine routine examination was positive for bilirubin. His X-ray chest was normal. Ultrasonography scan (USG) of the abdomen showed multiple stones in the gall bladder with normal wall thickness of 1-2 mm. The CBD was dilated (15 mm in maximum diameter) and had an obstructing stone at its terminal end. A Magnetic Resonance Cholangio-Pancreaticography (MRCP) scan confirmed these findings and revealed a longitudinally impacted, terminal CBD, spindle shaped, 20×15 mm sized stone [Table/Fig-1a].

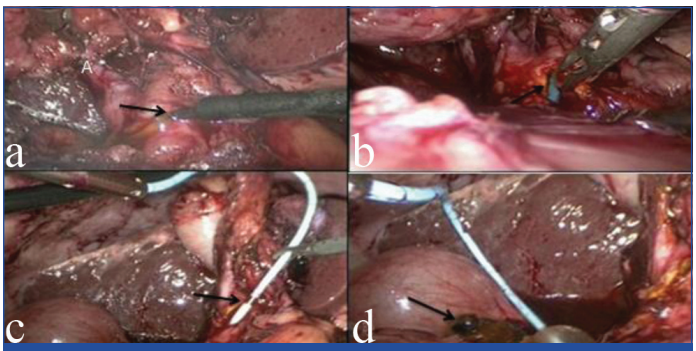
The patient was then subjected to endotherapy. At ERCP, selective cannulation of the CBD could not be achieved at the first attempt. At the second attempt, deep selective CBD cannulation was achieved but the impacted, large, obstructing stone could not be retrieved. The CBD was then stented with a 7 Fr. Stent [Table/Fig-1b,c] and the patient was referred back to us for further management. He was then planned for surgery. At laparoscopy, a trans-cystic cholangiogram was obtained and it confirmed the preoperative imaging findings.



[Table/Fig-1]: Imaging and Endoscopy- a) shows MRCP film showing multiple gall stones (white arrow) and solitary, large, spindle shaped, impacted terminal CBD stone (black arrow), b) ERCP picture showing duodenal end of CBD stent in situ (black arrow) with free flow of bile (blue arrow) and c) shows fluoroscopy image taken during/after ERCP showing CBD stent in-situ (black arrow).

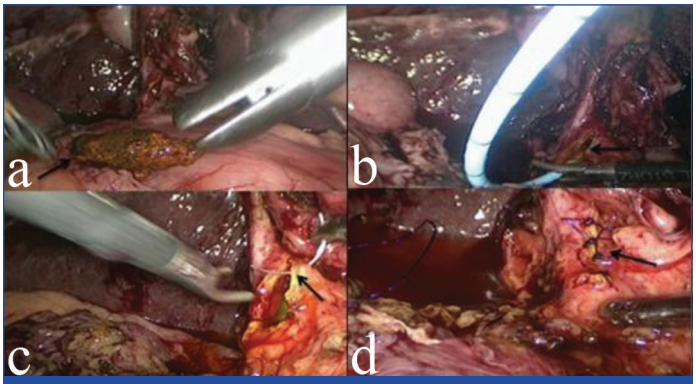
A choledochotomy was performed just distal to the insertion of the cystic duct on the CBD [Table/Fig-2a,b]. Through this, multiple endoscopic dormia basket distal swipes were performed without any positive result. Then, an endoscopic balloon was inserted distally through the choledochotomy [Table/Fig-2c]. It was then inflated and a distal CBD swipe performed. This yielded a positive

result and the obstructing calculus was thus swiped out through the choledochotomy, in one piece [Table/Fig-2d,3a]. The CBD stent was noted in situ [Table/Fig-2b].



[Table/Fig-2]: Operative images- a) shows laparoscopic choledochotomy being done (black arrow), b) shows part of CBD stent (inserted during ERCP) in-situ, through the choledochotomy (black arrow), c) shows endoscopic balloon swipe in distal CBD being performed (black arrow) and d) shows large CBD stone (black arrow) extracted by distal CBD balloon swipe.

Multiple proximal [Table/Fig-3b] and distal balloon swipes were performed in an attempt to retrieve any missed stone piece. These were negative. A check occlusion cholangiogram was then performed proximally and distally using the endoscopic balloon catheter and it ruled out any residual choledocholithiasis. The choledochotomy was then closed using 3-0 polydioxanone using simple interrupted sutures [Table/Fig-3c,d]. The LC was then completed. He had an uneventful postoperative recovery and was discharged from the hospital after three days. On his postoperative day 10 surgical outpatient department follow-up visit, he was asymptomatic and all the surgical wounds had healed well. The serial repeat liver profiles done after the surgery showed a progressive normalisation of values.



[Table/Fig-3]: Operative images- a) shows extracted CBD stone in one piece (black arrow), b) shows proximal bile duct balloon swipe being done (black arrow), c) shows choledochotomy being suture closed (black arrow) and d) shows end result.

DISCUSSION

Endoscopic Retrograde Cholangio-Pancreatography (ERCP) success rate for stone clearance is 87% to 97% but upto 25% of patients require two or more different sessions of treatment [1]. The associated morbidity and mortality rates are 5% to 11% and 0.7% to 1.2%, respectively. Complications of ERCP include bleeding, duodenal perforation, cholangitis, pancreatitis and bile duct injury [2]. Intraoperative ERCP with or without endoscopic ultrasound is another option for retrieval of CBD stones, particularly stones in the common hepatic duct or intrahepatic system. The use of intraoperative ERCP is effective but it requires additional equipment and additional personnel. Postoperative ERCP may be required sometimes in patients with incomplete stone clearance or retained stones [3].

In cases of ERCP failure, open/laparoscopic CBD exploration may be required. The CBD can be accessed either through the cystic duct (transcystic approach) or directly through a choledochotomy incision. The main benefit of choledochotomy is that it provides direct access to both the CBD and the common hepatic duct, enabling access to and retrieval of, more difficult stones. Factors influencing success/failure of laparoscopic management of CBD stones are surgical expertise, adequate equipment, the biliary anatomy and the number and size of CBD stones. Success rate of complete stone clearance by LCBDE ranges from 85% to 95% with morbidity ranging from 4% to 16% and mortality from 0% to 2% [4]. Specific complications include bile leak and formation of CBD stricture.

A meta-analysis of 1762 patients who underwent LCBDE from 19 studies worldwide showed a mean duct clearance of 80% with average morbidity of <10% (4-16%) and mortality of <1% (0-2.7%) [5]. Also, transcystic CBD stone clearance may have a recovery very similar to that of standalone LC as it is a more anatomical approach [6,7]. A meta-analysis by Guruswamy KS and Samraj K in 2007 showed no statistically significant difference in any of the outcomes between primary closure of choledochotomy and closure done over a T-tube, apart from the hospital stay; which was significantly lower in the primary closure group [5]. An alternative to a T-Tube is antegrade stent placement and then primary duct closure over it. Another alternative to a T-tube is the transcystic placement of a ureteric catheter brought out through the abdominal wall with a primary closure of the CBD [8]. Other options such as Extracorporeal Shock Wave Lithotripsy (ESWL), LASER lithotripsy and use of dissolving solutions such as Urso-Deoxy-Cholic Acid (UDCA) and Methyl Tert Butyl Ether (MTBE) have not gained acceptance.

One of the necessary and useful pre-requisites for a LCBDE is the presence of a choledochoscope, which enables direct intra-ductal vision; direct vision guided stone clearance and eventually a direct visual confirmation of complete ductal clearance. It is especially invaluable in patients with multiple CBD stones. Inspite of its non availability in our setup, authors still attempted a LCBDE, given the presence of a solitary, large CBD stone (instead of multiple stones), confirmed preoperatively on a good quality MRCP scan as well as on ERCP. As already mentioned, we used intraoperative fluoroscopy to give us image guidance for ascertaining the pre-retrieval location of the stone and then to confirm absence of residual stone/s after retrieval of the big one.

It is not the intention of this paper to present LCBDE as an alternative to ERCP. In fact, in our department, the established therapeutic policy for choledocholithiasis and cholelithiasis is ERCP followed by LC; as is the case in most centres around the world. But, in cases of ERCP failure, LCBDE is a feasible and available option.

CONCLUSION(S)

There are numerous options for the management of CBD stones. ERCP followed by LC is the present standard of care. LCBDE requires advanced surgical skills including endosuturing. Ultimately the operating surgeon should decide on the appropriate approach and treatment based on his own skills, the patient's condition and the availability of endoscopic expertise. As seen in the present case, LCBDE is a safe and feasible option with the advantages of minimal access and early recovery in skilled hands. Even in setups which lack a choledochoscope, LCBDE is feasible, in select cases.

REFERENCES

[1] Shojaiefard A, Esmaeilzadeh M, Ghafouri A, Mehrabi A. Various techniques for the surgical treatment of common bile duct stones: A meta review. Gastroenterol Res Pract. 2009;2009:840208. Doi: 10.1155/2009/840208. Epub 2009 Aug 6. PMID: 19672460; PMCID: PMC2722154.

[2] Gad EH, Zakaria H, Kamel Y, Alsebaey A, Zakareya T, Abbasy M, et al. Surgical (open and laparoscopic) management of large difficult CBD stones after different sessions of endoscopic failure: A retrospective cohort study. Ann Med Surg (Lond) 2019;43:52-63.

[3] Nathanson LK, O'Rourke NA, Martin IJ, Fielding GA, Cowen AE, Roberts RK, et al. Postoperative ERCP versus laparoscopic choledochotomy for clearance of selected bile duct calculi: A randomized trial. Ann Surg. 2005;242:188-92. Doi: 10.1097/01.sla.0000171035.57236.d7.
[4] Thompson MH, Tranter SE. All-comers policy for laparoscopic exploration of the common bile duct. Br J Surg. 2002;89(12):1608-12. Doi: 10.1046/j.1365-2168.2002.02298.x.
[5] Guruswamy KS, Samraj K. Primary closure versus T-tube drainage after laparoscopic common bile duct exploration. Cochrane Database Syst Rev. 2007;1:CD005641.
[6] Meman MA, Meman MI. Laparoscopic common bile duct exploration: The past, the present and the future. Am J Surg. 2000;179:309-15. Doi: 10.1016/S0002-9610(00)00346-9.
[7] Lezoche E, Pagani A, Carlei F, Felicioth F, Lomanto D, Guerrie M. Laparoscopic treatment of gallbladder and common bile duct stones: A prospective study. World J Surg. 1996;20:535-42. Doi: 10.1007/s002689900083.
[8] Wei Q, Hu HJ, Cai XY, Li LB, Wang GY. Biliary drainage after laparoscopic cholecystectomy. World J Gastroenterol. 2004;10:3175-78.

PARTICULARS OF CONTRIBUTORS:
1. Clinical Assistant, Department of General Surgery, Dr LH Hiranandani Hospital, Powai, Mumbai, Maharashtra, India.
2. Consultant, Department of General Surgery, Dr LH Hiranandani Hospital, Mumbai, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Abhijit S Joshi,
Consultant, Department of General Surgery, Dr. LH Hiranandani Hospital,
Mumbai-400076, Maharastra, India.
E-mail: asjex1974@yahoo.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Mar 08, 2021
- Manual Googling: Jun 10, 2021
- iThenticate Software: Jun 21, 2021 (9%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Mar 05, 2021**
Date of Peer Review: **May 27, 2021**
Date of Acceptance: **Jun 11, 2021**
Date of Publishing: **Jul 01, 2021**