Management of CBD stones-a comparative study of ERCP guided CBD stone removal and open surgery

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Abstract:
Background & Objectives: To review the patients who underwent open surgery or endoscopy for common bile duct stone removal. To compare the efficacy of open surgery versus endoscopy in terms of achievement of common bile duct clearance with respect to the size of the stone, to compare the efficacy in terms of achievement of regression of symptoms, signs and biochemical parameters and post operative complications and incidence of mortality. **Material and Method:** This is a prospective study of management of 40 cases of CBD stones, performed in the Surgery Department of Civil Hospital, Ahmedabad. **Result:** Open surgery is better than ERCP in terms of improvement of symptoms and lab parameters (95%>80%), morbidity and duct clearance (95%>80%). **Conclusion:** Open surgery is more efficacious than ERCP in terms of achievement of common bile duct clearance, safer than ERCP in terms of minor morbidity, in terms of achievement of regression of symptoms, signs and biochemical parameters for common bile duct calculi. Open surgery and ERCP are comparable in terms of major morbidity. ERCP is safer than open surgery in terms of incidence of mortality.
Keywords:- Open surgery, ERCP, CBD stones

Introduction

Common bile duct (CBD) calculi are not very common among the general population[1]. They usually occur as a complication of gall bladder (GB) calculi. However, left untreated, they cause significant morbidity, including obstructive jaundice, pain, vomiting and even life threatening complications like pancreatitis, cholangitis and septicemia. Multiple treatment modalities have been developed over the years to treat CBD stones. However, a consensus on the best method for stone removal has not yet been reached. Open surgery was the cornerstone for treatment of CBD stones for many decades. However, with increasing medical and scientific research, newer methods of intervention have been developed. Endoscopic retrograde cholangiopancreatography (ERCP) and endoscopic biliary sphincterotomy (EBS) have opened new avenues in management of patients with CBD stones[2], enabling gastroenterologists and surgeons to treat patients without resorting to a laparotomy. The most recent innovations include laparoscopic exploration of the biliary tree and stone removal, a procedure gaining popularity as expertise and experience in the field grow.

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Material and Method

This is a prospective study of management of 40 cases of CBD stones, performed in the Surgery Department of Civil Hospital, Ahmedabad during the period may 2017 to oct 2019. Of these, 20 were managed by open surgery while the other 20 were managed by ERCP.

Types of participants (patients):

- Those with proven CBD stones prior to open or laparoscopic cholecystectomy.
- Those found to have CBD stones having previously had a cholecystectomy.

Each patient was carefully evaluated by adequate history taking, clinical examination, laboratory tests and non invasive radiological investigations and analyzed according to the data collected on a planned proforma prepared for the study.

Result

CANNULATION RATE		
SUCCESSFUL	19	95.00%
UNSUCCESSFUL	1	5.00%

Out of 20 ERCP procedures done, cannulation was successful in 19 (95%) patients while it was unsuccessful in 1 (5%) patients[3]. Successful cannulation rate in study done by Sugawa et al[5] was 95%, in Sherman et al[6] was 98% and in Lauri et al[7] was 85%.

PROCEDURE	OPEN CDD	CDL+T–TUBE
NO. OF PATIENTS	15	5
PERCENTAGE	75%	25%

Among 20 patients who underwent open surgery, 15 (75%) underwent open Choledocho-duodenostomy and the remaining 5 (25%) underwent Choledocholithotomy with T-Tube placement[4]. Choice between the two procedures was made depending on size of the CBD, number of stones and the presence of sludge.

FOLLOW UP	OPEN	OPEN	ERCP	ERCP
SYMP RELIEF	19	95.00%	16	80.00%
RELIEF OF JAUNDICE	19	95.00%	16	80.00%
RED IN S. BILIRUBIN	19	95.00%	16	80.00%
RED IN S. ALP	19	95.00%	16	80.00%
NORMAL POST USG	19	95.00%	16	80.00%

Out of 20 patients, 19 (95%) showed improvement in both symptoms and lab parameters in the open surgery group while 16 (80%) showed improvement in the ERCP group[5]. Out of 20 patients, the incidence of various morbidities in patients undergoing ERCP was as follows : clinical pancratitis (hyperamylasemia with clinical fatures of pancreatitis) in 1 (5%) patients, bleeding in 1 (5%), cholangitis in 1 (5%), sepsis in 2 (10%) and hyperramylasemia (>140 SU/L) in 12 (60%) of patients. Ersoz et al found incidence of hyperamylasemia to be 100% in their study. Mallery et al found incidence of pancreatitis to be 7%, bleeding 2% cholangitis 1.5% and sepsis to be 1.6%. Out of 20 patients in the open surgery group, the incidence of various morbidities was as follows : intra-abdominal abscess in 1 (5%), sepsis in none, cardiopulmonary event in 1 (5%), sump syndrome in 1 (5%), cholangitis in 1 (5%), wound infection in 6 (30%) and minor bile leak in 1 (5%)[5]. Deutsch el al found incidence of wound infection to be 14% and that of minor bile leak to be 3%[6]. Ramirez et al found incidence of intraabdominal abscess to be 1.6%[7]. Baker et al found incidence of cardiopulmonary event to be 5%, that of sump syndrome to be 3.3% and that of cholangitis to be 5.7%.

In our study, duct clearance in open surgery was found to be 95%, duct clearance in ERCP was found to be 80% as compared to 88% in Sugawara et al[5], 93% in Sherman et al 6 and 59% in Lauri et al[7] studies. This difference is statistically significant (p value < 0.05).

Therefore open surgery is more efficacious than ERCP in terms of duct clearance. 1 patient in the open surgery group who did not have duct clearance was subjected to ERCP later on while out of 4 patients without duct clearance in the ERCP group[7], 1 underwent an open procedure while the other 3 underwent a repeat ERCP.

Discussion

This was a prospective study of management of 40 cases of CBD stones, performed in the Surgery Department of Civil Hospital, Ahmedabad during the period 2007 to 2009. Of these, 20 were managed by open surgery while the other 20 were managed by ERCP.

1. Out of 20 open surgeries, 15 underwent a Choledochoduodenostomy while 5 underwent a Choledocholithotomy with T-tube placement. In ERCP group, 19 patients had EBS with Dormia-basketing and stenting while in 1 patient, cannulation was not possible.
2. All patients were followed up immediately post procedure, at 15 days and at 30 days. Follow up was in terms of clinical assessment and laboratory parameters.
3. On follow up, regression of symptoms and laboratory parameters was seen in 19 patients (95%) in open surgery group and in 16 patients (80%) in ERCP group.
4. The incidence of duct clearance was 95% in open surgery and 80% in ERCP.
5. The incidence of duct clearance for large stones (size >1cm) was 100% in open surgery and 75% in ERCP .
6. The incidence of duct clearance for small stones (size <1cm) was 86% in open surgery and 100 % in ERCP[9].
7. An additional procedure was required in 5 % of patients who underwent open surgery as compared to 20 % of patients who underwent ERCP.
8. The incidence of major morbidity was 20 %

in open surgery while it was 15% in ERCP.

9. The incidence of minor morbidity was 30% in open surgery and 60% in major surgery.
10. The incidence of mortality was 5 % in open surgery and 0% in ERCP.

Conclusion

The present study at the end of 1 month follow up concludes that:

1. Open surgery is more efficacious than ERCP in terms of achievement of common bile duct clearance for common bile duct calculi.
2. For the optimum management of CBD stones, stone size should be taken into consideration. Open surgery is better than ERCP in terms of achievement of common bile duct clearance for large (size>1cm) common bile duct calculi. ERCP is better than open surgery in terms of achievement of common bile duct clearance for small (size<1cm) common bile duct calculi.
3. Open surgery is more efficacious than ERCP in terms of achievement of regression of symptoms, signs and biochemical parameters for common bile duct calculi.
4. Open surgery is safer than ERCP in terms of incidence of minor morbidity.
5. Open surgery and ERCP are comparable in terms of major morbidity.
6. ERCP is safer than open surgery in terms of incidence of mortality. 7. The use of ERCP necessitates increased number of procedures per patient.

References

1. Ko, CW, Lee SP. Epidemiology and natural history of common bile duct stones and prediction of disease. GastrointestEndosc 2002;56:S165 691
2. Tierney S, Pitt, HA. Choledocholithiasis and cholangitis. In: Bell RH, Rikkers LF, Mulholland MW (eds), Digestive Tract Surgery: A Text and Atlas. Philadelphia: Lippincott-Raven; 1996:407-431
3. Kaufman HS, Magnuson TH, Lillemoe KD, et al. The role of bacteria in gallbladder and common duct stone formation. Ann Surg 1989;209:584- 592 [PubMed: 27058231
4. Cetta F. Bile infection documented as initial event in the pathogenesis of brown pigment biliary stones. Hepatology 1986,6:482-489 [PubMed:3519417]
5. Faust TW, Reddy KR. Postoperative jaundice. Clin Liver Dis 2004;8(1):151-166 [PubMed: 15062 198]
6. Eisen GM, Dominitz JA, Faigel DO, et al. An annotated algorithm for the evaluation of choledocholithiasis. GastrointestEndosc 2001; 53:864866 [PubMed: 11375619]
7. Goldman DE, Gholson CF. Choledocholithiasis in patients with normal serum liver enzymes. Dig Dis Sci 1995;40:1065 1068 [PubMed:7729265]
8. Abboud PA, Malet PF, Berlin JA, et al. Predictors of common bile duct stones prior to cholecystectomy: A meta-analysis. Gastroin testEndosc 1996;44:450-455 [PubMed: 8905367]
9. E. S.J. Clayton, S. Connor, N. Alexakis and E. Leandros. Meta-analysis of endoscopy and surgery versus surgery alone for common bile duct stones with the gallbladder in situ. Paper accepted 25 August 2006.Published online 11 September 2006 in WileyInterScience www.bjs.co.uk), DOI: 10.1002/bjs.5568