

A Prospective Study on Different Biliary Diversions in Common Bile Duct Stones.

Rajesh Kumar Dora¹, Gorachand Murmu², Santosh Kumar Behera³, Sumeet Deshpande³, Ankur Anand³

¹Assistant Professor, Department of Surgery, S. C. B. Medical College, Cuttack.

²Senior Resident, Department of Surgery, S. C. B. Medical College, Cuttack.

³Junior Resident, Department of Surgery, S. C. B. Medical College, Cuttack.

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ABSTRACT

Background: Choledocholithiasis leads to unconjugated hyper bilirubinemia which is manifested as intermittent jaundice. This type of jaundice is known as obstructive or surgical jaundice. The aim of this study is to evaluate the effectiveness and safety of Biliary Diversions in Choledocholithiasis. **Methods:** 50 Cases were selected for this study. A suitable biliary bypass was done in each case and the patients were evaluated in the post-operative period by clinical examination, biochemical parameters and ultrasonography. The follow up period was 6 months to one year. The duration of post-operative hospital stay was documented. The relative merits and demerits of each procedure were assessed and the results were documented. **Results:** Choldochoduodenostomy is a safe and regular procedure done as a biliary diversion in cases of choledocholithiasis. Morbidity and mortality is less associated with this procedure. Duration of hospital stay is less. Hence return to work is early. **Conclusion:** Choldochoduodenostomy procedure can be considered as a first line surgical management technique in patients of choledocholithiasis.

Keywords: Choledocholithiasis, choledochoduodenostomy, choledochojejunostomy, hepaticojejunostomy, cholecystojejunostomy.

INTRODUCTION

Choledocholithiasis leads to unconjugated hyper bilirubinemia which is manifested as intermittent jaundice. This type of jaundice is known as obstructive or surgical jaundice.^[1] If early intervention is not done it may lead to cholangitis, biliary cirrhosis, progressive liver dysfunction, impaired renal function and multiorgan dysfunction leading to death.^[2] Choledocholithiasis may be due to solitary, multiple or retained stones with a dilated duct. Biliary diversions are the main stay of treatment.^[3]

Controversy still exists regarding the appropriate biliary diversion procedure. Non operative procedures have been considered in a non-dilated duct and are associated with complications like bleeding, pancreatitis, cholangitis and duodenal perforation. Late complications are more associated with non-operative techniques.^[4]

Surgical techniques like biliary diversions in experienced hands offer better relief than non-operative procedures.^[5] This study is aimed at different surgical procedures and their outcome.

Biliary tract has been well described by many authors.^[2-6] Common bile duct stones may be primary or secondary. Primary stones are brown pigment stones formed in the CBD and biliary tree. They are multiple, sludge like or mixed. Secondary biliary stones are black pigment stones. These stones are cholesterol stones from the gall bladder which passes down. It is seen in 15 % of gall stone disease. 75 % are cholesterol stones and 15 % are pigment stones.

Biliary obstructions may be Type-1-Complete obstruction with jaundice due to tumour in the pancreatic head, complete ligation of CBD, Cholangiocarcinoma.

Type-2-Intermittent obstruction producing symptoms and alteration of bio chemical parameters. They may or may not be associated with clinical jaundice. They are due to CBD stones, periampullary tumours, duodenal diverticula, choledochal cyst, haemophilia and intra biliary parasites. Type-3-Chronic incomplete obstruction with or without symptoms causing pathological changes in the bile duct. They are due to CBD stricture –congenital, traumatic or cholangitis, Stenos bilio-enteric anastomosis, chronic

Name & Address of Corresponding Author

Dr.Rajesh Kumar Dora.
Assistant Professor,
Department of Surgery,
S.C.B.Medical College,
Cuttack,
Odisha .

pancreatitis or stenosis of sphincter of oddi. Type-4-Segmental obstruction with obstruction of one or more anatomical segments of the intra hepatic biliary tree. They may be due to trauma, hepatic duct stones, sclerosing cholangitis and cholangio carcinoma.^[7]

MATERIALS AND METHODS

This study was conducted in the Department of Surgery, S.C.B. Medical College, Cuttack, Odisha from August 2013 to July 2016. Cases were selected from patients presenting with features suggestive of choledocholithiasis who were managed with biliary by-pass procedures.

50 Cases were selected for this study. Detailed history, thorough clinical examination and all relevant investigations were done to confirm the diagnosis of choledocholithiasis. A suitable biliary bypass was done in each case and the patients were evaluated in the post-operative period by clinical examination, biochemical parameters and ultrasonography.

Different biliary diversion procedures done in this study are- Choledochoduodenostomy (side to side lateral choledochoduodenostomy done in 30 cases), Choledochojejunostomy (Roux-en-Y end to side or side to side choledochojejunostomy in 12 cases, Cholecystojejunostomy using a loop of jejunum in 5 cases and Hepaticojejunostomy, Roux-en-Y end to side hepaticojejunostomy in 3 cases.

The follow up period was 6 months to one year. The duration of post-operative hospital stay was documented. Complications which occurred during the hospital stay were noted as early morbidity. Complications associated with each biliary by pass procedure and the patient's mortality and morbidity was studied. The relative merits and demerits of each procedure were assessed and the results were documented. The aim of this study is to evaluate the effectiveness and safety of Biliary Diversions in Choledocholithiasis.

RESULTS

Table 1: Age distribution of study group.

Age in years	Male	%	Female	%	Total no:of cases(Male and Female)	%
11-20	3	6	0	0	3	6
21-30	4	8	3	6	7	14
31-40	3	6	3	6	6	12
41-50	8	16	12	24	20	40
51-60	4	8	6	12	10	20
61-70	2	4	2	4	4	8
Total	24	48	26	52	50	100

[Table 1] shows that increase incidence of cases was in the age group of 41-50 years (40%) and then 20% in age group of 51-60years. The lowest age of

presentation was 16 years and highest age was 64 years.

Table 2: Sex distribution of study group.

No. of Cases	Male	Percentage	Female	Percentage
50	24	48	26	52

Out of these 50 case, 24 were male (48%) and 26 were females (52%). Male to female ratio was 1:1.9. Choledocholithiasis has female preponderance [Table 2].

Table 3: Clinical presentation of study group.

Type of symptoms	No. of cases	Percentage
Jaundice	44	88
Pain abdomen	48	96
Fever with rigor	29	58
Pruritus	32	64
Loss of weight	10	20

In this study pain abdomen was the main presenting symptom followed by Jaundice [Table 3].

Table 4: Different operative procedures who underwent Biliary bypass in choledocholithiasis. (n=50)

Operative Procedure	No. of Cases	Percentage
Choledochoduodenostomy	30	60 %
Choledochojejunostomy	12	24 %
Cholecystojejunostomy	5	10 %
Hepaticojejunostomy	3	6 %

Choledochoduodenostomy was the preferred surgical technique done in most of the cases (60%) besides choledochojejunostomy in 24% cases [Table 4].

Table 5: Duration of post-operative hospital stay.

Duration (in days)	No. of Cases	Percentage
10-15	40	80 %
15-25	7	14 %
>25	3	6 %

This study shows that majority of the patients stayed in the hospital from 10-15 days (80%). Only 3 patients were hospitalised for more than 25 days (6%).The minimum hospital stay in this series was 10 days and the maximum stay was 45 days (average-15days). Only 1 patient stayed for 3 months who was associated with co morbidities. This patient had under-gone choledochojejunostomy who subsequently developed bilio- enteric fistula which was the reason for a longer hospital stay [Table 5].

All the cases were followed for 6 months to 1 year. These patients were examined clinically, biochemical parameters and an ultrasonography done.

This comparison table shows the incidence of early morbidity, late morbidity and mortality. The overall incidence of early morbidity was 10 %, late morbidity 18% and mortality 4%.Overall clinical improvement was seen in 64 % of cases [Table 6].

Early morbidity (within post-operative period and hospital stay) was studied. 1 case that underwent choledochoduodenostomy developed anastomotic leak which was conservatively managed. 1 case of choledochojejunostomy developed biliary fistula and was managed conservatively. Out of the 2 patients

who had undergone hepaticojejunostomy, 1 patient developed renal failure and died in the hospital on the 8th post-operative day and the other patient developed renal failure, bilio-enteric fistula and died in the hospital 20 days after surgery.

Table 6: Early morbidity and mortality following different surgical procedures. (n=50)

No morbidity	%	Early morbidity	%	Late morbidity	%	Mortality	%	Total
14 patients	28	5 patients	10	9 patients	18	2 patients	4	16 patients

Late morbidity (occurring 30 days after surgery) was also studied which showed 3 cases of impacted CBD stone who underwent choledochoduodenostomy, 2 cases with choledochojejunostomy and 1 case with hepaticojejunostomy developed features of cholangitis including right upper abdominal pain,

fever, rigor and jaundice. All the cases were managed conservatively with adequate antibiotics. The incidence of late morbidity was 9 out of 50 cases (18%). Death within 30 days occurred in 2 cases that underwent hepaticojejunostomy. The mortality rate was 4 %.

Table 7: Morbidity following different surgical procedures in patients of choledocholithiasis.

No. of cases	Procedure	Anastomotic Leak	Cholangitis	Recurrent Jaundice	Renal failure	Biliary Fistula	Death
30	Choledochoduodenostomy	1	2	1	0	0	0
12	Choledochojejunostomy	1	2	1	0	1	0
3	Hepaticojejunostomy	1	1	0	2	1	2
5	Cholecystojejunostomy	0	2	2	0	1 pt.had septicemia	

Out of the 30 cases who underwent Choledochoduodenostomy 1 case (3.33%) developed anastomotic leak, 2 cases had cholangitis and 1 case had both cholangitis and recurrent jaundice. Of the 12 cases undergoing choledochojejunostomy, 2 cases developed cholangitis, 1 case had anastomotic leak (8.33%) which led to biliary fistula and 1 patient developed recurrent jaundice [Table 7].

Amongst the 3 cases who had hepaticojejunostomy, 1 case (3.33%) developed both anastomotic leak and cholangitis. 2 cases developed renal failure and both of them died. 2 cases who had Cholecystojejunostomy developed cholangitis and recurrent jaundice.

DISCUSSION

Stones in the common bile duct most commonly result from the passage of gallstones through the cystic duct into the common bile duct. Less frequently, they may originate in the common bile duct itself. Stones in the common bile duct can cause biliary obstruction, cholangitis, pancreatitis, or secondary biliary cirrhosis in patients who have had the stones for a long time. More than 1 in 10 patients (10%–18%) undergoing cholecystectomy for gallstones have concomitant common bile duct stones, and up to 3.8% have symptoms related to common bile duct stones during the first year after cholecystectomy.^[8]

Open surgical techniques have been superseded by endoscopic techniques. The most common treatment modality is ERCP, with duct cannulation and clearance rates reaching 98% in expert hands.²⁸ Intraoperative ERCP at the time of laparoscopic cholecystectomy (also called “laparoendoscopic rendez-vous”) is practised in some centres. It may have advantages, but it presents substantial logistical challenges. It involves the placement of a wire through the cystic duct to the ampulla at the time of laparoscopic cholecystectomy to ensure successful ERCP cannulation.^[9] Open surgical exploration of the common bile duct was historically combined with intraoperative cholangiography at open cholecystectomy to diagnose and treat common bile duct stones. In the era of laparoscopic cholecystectomy, surgical options have been limited mainly to intraoperative cholangiography and occasional transcystic stone removal. The surgical removal of common bile duct stones, whether open or laparoscopic, has become a seldom-performed operation, usually reserved for patients in whom ERCP has failed. Laparoscopic exploration of the common bile duct may be considered in patients with larger stones, but it is practised by few groups.^[10-12]

In the era of open cholecystectomy, open exploration of the common bile duct was found to be superior to ERCP in achieving stone clearance (odds ratio [OR] 2.89, 95% CI 1.81–4.61).^[13] Open exploration

remains a safe approach and is the “gold standard” if ERCP fails. Hepaticojejunostomy is reserved for the rare patient with many stones.

The management of common bile duct stones has undergone substantial evolution with the advent of accurate and safe methods of diagnosis and treatment. These advances have led to algorithms with safer treatment options and to the emergence of newer concepts such as the “silent” stone. Any contemporary approach to the management of common bile duct stones must take into consideration the availability of local expertise and technology. An integrated health care team including surgeons, gastroenterologists and radiologists will help to decrease patient morbidity, enhance cost-effectiveness and optimize patients’ quality of life.^[14]

CONCLUSION

From the above study it is observed that Choldochoduodenostomy is a safe and regular procedure done as a biliary diversion in cases of choledocholithiasis. Morbidity and mortality is less associated with this procedure. Duration of hospital stay is less. Hence return to work is early. This operative procedure can be considered as a first line surgical management technique in patients of choledocholithiasis.

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