

Clinical Indications and Outcomes of Bilioenteric Bypass at a Single Tertiary Care Centre in India

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Abstract

Introduction: Bilioenteric bypass procedures are commonly done for extra hepatic biliary tree pathologies. Different procedures like Roux–en-Y hepatico-jejunostomy, choledochojejunostomy, choledochoduodenostomy or cholecysto-jejunostomy, by either conventional open or minimally invasive techniques can be considered depending on the diagnosis.

Materials and Methods: 30 patients operated for bilioenteric bypass in our institute from December 2018 to December 2020 were retrospectively studied. The study analyzed clinical presentations, diagnosis, treatment, and postoperative outcomes.

Results: We observed male predominance with ratio of 1.5:1, commonest age being 41 to 60 years. Most common symptom overserved was abdominal pain (74%) followed by jaundice. Malignant etiology was found in 30% and iatrogenic biliary injuries was found in 26% of patients. Roux en Y Hepaticojejunostomy was the commonest (70%) procedure done followed by Cholecystojejunostomy (16%). 13% of patients had early post-operative complications and 10% developed recurrence of symptoms. They were managed conservatively.

Conclusion: Bilioenteric bypass is the procedure of choice in patients with obstructive jaundice with either benign or malignant cause. Despite the technological advances, outcome of bilioenteric bypass surgeries depend mainly on surgeons' skills and experience, pre operative optimization and post operative care. 90% of our patients had good postoperative outcome with only 10% with complications.

Keyword: Cholecystojejunostomy, Bilioenteric bypass, Hepaticojejunostomy, choledochoduodenostomy, Biliary tree, Jaundice.

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Introduction

Disorders of biliary system affect a significant amount of population over the world. Bilioenteric bypass surgeries are done to divert biliary flow in patients with benign and malignant extra hepatic biliary tract disorders like obstruction, congenital anomalies and bile duct injuries. If there is evidence of advanced malignancy or if the patient is unfit for surgical intervention, non-operative procedures are a suitable alternative [1]. Difficult laparoscopic cholecystectomy has increased chances of having iatrogenic bile duct injuries. There are different bilioenteric bypass procedures depending on the anatomy and pathology, which can be performed like Roux-en-Y hepaticojejunostomy, choledochojejunostomy, choledochoduodenostomy, cholecystojejunostomy. Complex anatomical relations make the surgeries more intricate. These procedures can be done by conventional open technique, laparoscopic or robotic approaches depending upon the skills and facility available. The outcome depends on preoperative preparation, skills and experience of the surgeon and postoperative care of patient. Still the morbidity related to this procedure is very high. The objective of this study is to evaluate clinical indications and outcome of bilioenteric bypass surgeries at our centre.

Materials & Methods

In our study, the records of 30 patients operated for biliary bypass surgeries in a

single Tertiary care center in India, Topiwala national medical college and B.Y.L. Nair hospital in the past 2 years i.e., retrospective analysis from December 2018 to December 2020 were evaluated. Patients more than 18 years of age with benign or malignant etiology requiring bilioenteric bypass procedure were included in this study. All pregnant females were excluded from this study. Medical records of all patients were assessed with respect to the patient demographic details, blood investigations, radiological investigations, details of surgery and complications. A waiver of consent was taken for retrospective data record and ethics committee approval was obtained. Previous histopathology and laboratory reports were obtained from the case records. The main surgical bypass performed was Roux-en-Y hepaticojejunostomy / choledochojejunostomy. The patients were followed up for 12 months post-surgery.

Results

In our study of 30 patients of biliary-enteric bypass, male preponderance was seen (60%) with male to female ratio of 1.5:1, most commonly seen in the age group of 41 to 60 years (40%) with mean age of presentation being 44.2 years.

Pain in abdomen was the commonest symptom (74%) followed by the typical presentation of obstructive jaundice i.e. yellowish discoloration of eyes and urine, clay coloured stools and itching ranging from 60 to 66 %.

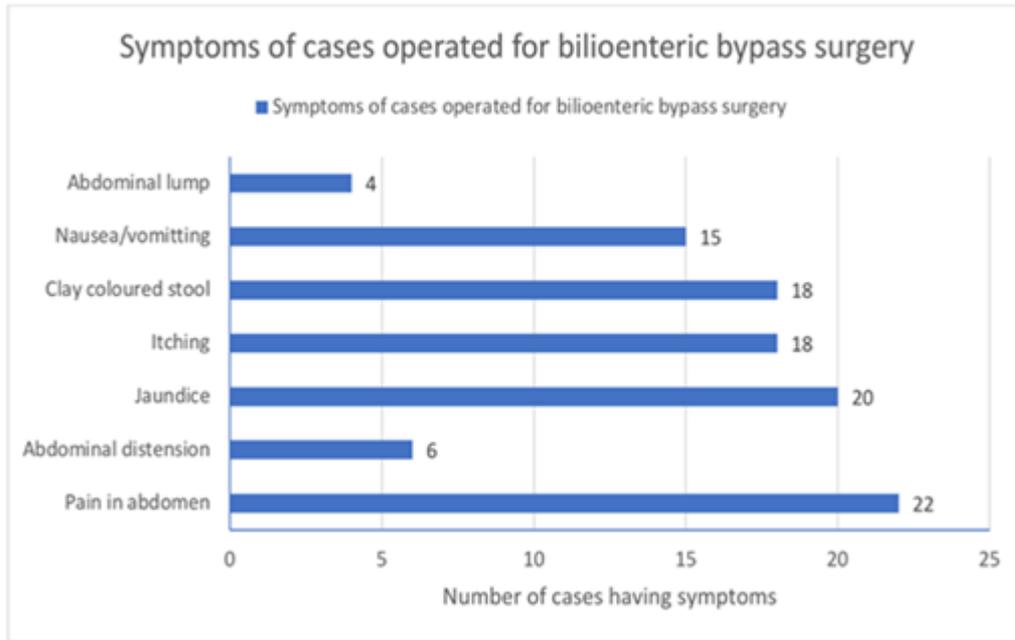


Figure 1: Symptoms of cases operated for bilioenteric bypass surgery

The indications for surgery were bile duct injury in eight patients, periampullary carcinoma in three, carcinoma pancreas in three, choledochal cyst in five, choledocholithiasis in four, lower Common Bile Duct (CBD) stricture in four, gall bladder carcinoma in two and

duodenal carcinoma in one patient. 62.5% of the patients with bile duct injuries were male. Twenty-one patients had benign etiology while nine patients had malignant lesions. Five patients out of those nine with malignant lesions had bilirubin level less than 3mg%.

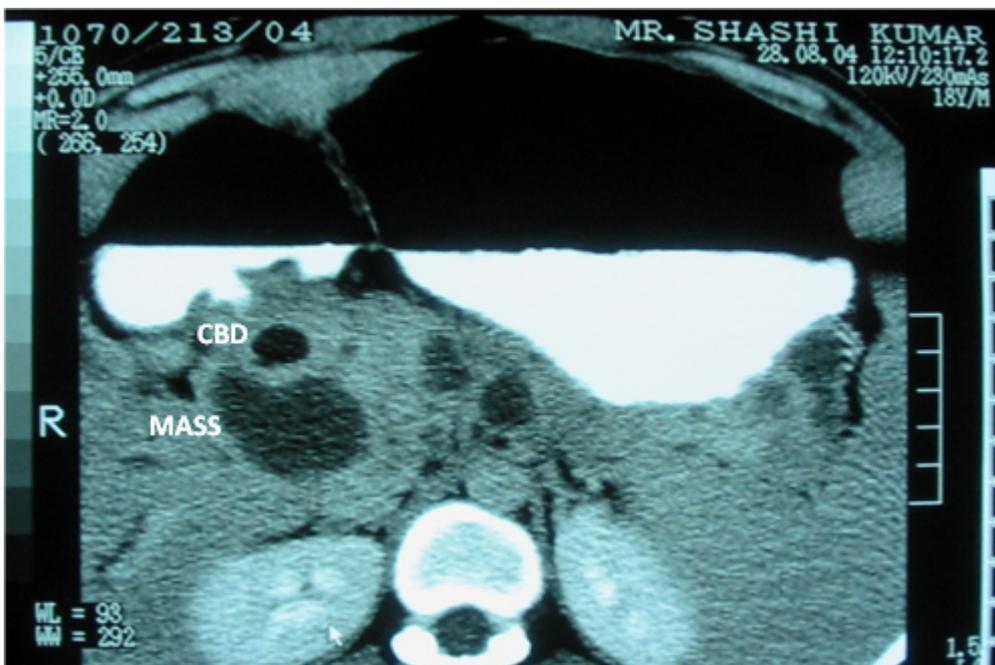


Figure 2: CT scan showing CBD dilatation due to neoplasm of the pancreas

Endoscopic Retrograde Cholangiopancreatography (ERCP) and Percutaneous

Transhepatic Biliary Drainage (PTBD) were procedures done for preoperative

biliary diversion to alleviate the symptoms. ERCP was routinely employed as a means of obtaining diagnostic biopsies from these patients. PTBD was done in 18 patients in our study with varied etiologies like bile duct injury, choledochal cyst, lower CBD stricture, carcinoma gall bladder, carcinoma head of pancreas and duodenal malignancy. Four

patients were taken directly for surgery of which two were of choledochal cyst and two had carcinoma pancreas.

Roux-en-Y Hepaticojejunostomy was the most common type of bilioenteric bypass done at our centre. Other surgical techniques employed were cholecystojejunostomy, choledochoduodenostomy and choledochojejunostomy.

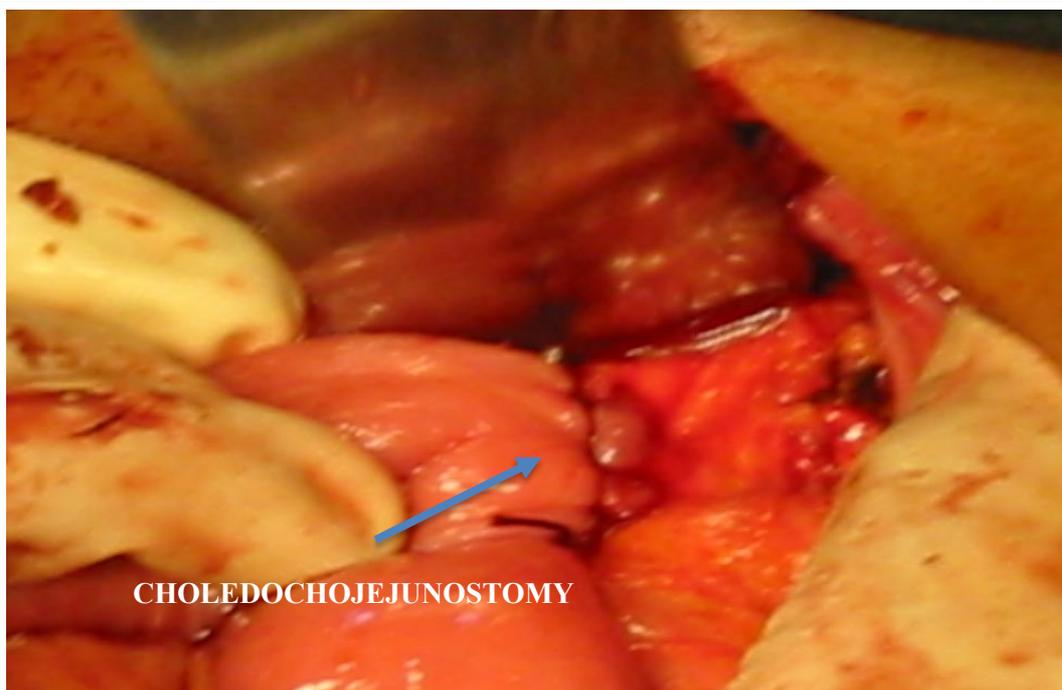
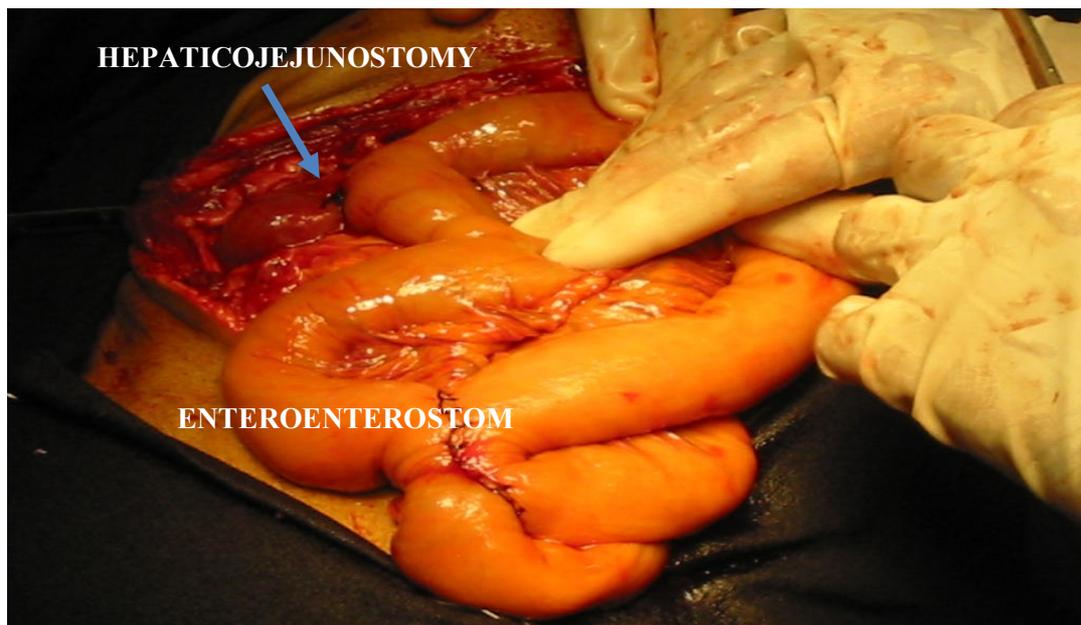


Table 2: Operative procedure performed in patients as per etiology

Operation performed / Indication	Type of bypass surgery	No(%)
Triple bypass	Cholecystojejunostomy	5(16)
Whipples procedure, Choledochal cyst excision, Bile duct injury, Choledocholithiasis	Hepaticojejunostomy	21(70)
Benign stricture of lower CBD, Choledocholithiasis.	Choledochoduodenostomy	2(7)
Benign stricture of lower CBD	Choledochojejunostomy	2(7)

Early postoperative complications were encountered in four patients in our study; of which two had burst abdomen and the rest two had an anastomotic leak. One patient with burst abdomen was managed conservatively with regular dressings while tension band wiring was done for the other. Patients with anastomotic leak had bilioma, which was managed with percutaneous pigtail catheter insertion. According to Clavien-Dindo classification(2) of complications, two patients fall in Class IIIa and two in Class II.

All patient were followed up for 12 months, out of which three patients had late complication of recurrent obstructive jaundice due to stricturous narrowing of the anastomotic site. These patients were conservatively managed by PTBD with balloon dilatation of the hepaticojejunostomy with internal drainage via interventional radiology.

Discussion

The biliary-enteric anastomosis has become a common component of multiple different surgical procedures. The most common indications for the creation of such an anastomosis is the resection of tumours involving the biliary tree, duodenum or pancreatic head (often as part of a pancreaticoduodenectomy), biliary stones, biliary strictures, choledochal cysts, or bile duct injuries; and inflammatory conditions of the biliary tree, such as primary sclerosing cholangitis [3]. Study conducted by Altaf Hussain et al shows that females are more predisposed for developing conditions requiring bilioenteric bypass as also

conveyed in the famous dictum of 'Fat Fertile Female of Forty'[4]. However, our study had male preponderance, with male to female ratio being 1.5:1 similar to study done by Swasthik et al [5]. Highest incidence was observed in age group of 41-60 years similar with findings of Altaf Hussain et al [4].

Out of the 30 cases enrolled in our study, CBD was the site of primary pathology in 20 cases followed by pancreas. Our study correlates with worldwide assessment that CBD is the site for most of the pathologies while duodenal pathology is the rarest. Bile duct injury remained the main reason for biliary enteric anastomosis followed by choledocholithiasis and choledochal cyst. In a study done by Thakur R et al, choledocholithiasis was most common cause (57.8%) followed by Gall Bladder carcinoma (25%) [6].

Despite pain in abdomen being the most common symptoms, which is seen in 22 patients it is considered insignificant because it is present in almost every abdominal pathology. Obstructive jaundice being the second most common symptom indicate the site, severity and the need of surgery after appropriate investigations. Other symptoms like nausea and vomiting with fever may indicate the presence of cholangitis. In cases of malignancy, lump and abdominal distension due to ascites may correspond to inoperability of the patient. In the study done by Swasthik et al, pain was the most common symptom followed by jaundice (55%) [5].

As most of the patients in our study were of iatrogenic biliary injury and choledochal cyst, Roux-en-Y

Hepaticojejunostomy was the most common type of bypass surgery done which correlates with study done by Kadaba et al [7]. Triple bypass with cholecystojejunostomy, choledochojejunostomy and choledochoduodenostomy were the procedures done for inoperable malignancies, lower CBD strictures and CBD stones. The most commonly performed procedure by Khan IM et al [8] was triple bypass attributing to more diseases being malignant.

Worldwide recognition of ERCP as basic preoperative procedure has improved the pre and postoperative management. 26 patients out of 30 underwent ERCP either for preoperative biopsy or for stenting. However, when ERCP is not feasible, PTBD helps in diversion of bile in major bile duct injuries or those who are in cholangitis. These biliary diversions act as a bridge between the insult and the definitive surgical treatment, to optimize the clinical condition of the patient before surgery [9]. PTBD in addition to surgical reconstruction has a higher success rate(98%) [10].

70% patients were operated for benign indications and the rest for malignant indications which was similar to the study done by Thakur et al where 67.2% patients had benign etiology [3]. In contrast, Madhu et al observed malignant and benign causes in 63.3% and 36.6% patients [11] and Verma et al reported malignancy in 62.7% and benign causes in 37.2% [12]. Laparoscopic cholecystectomy is essentially found surgically challenging and difficult in males, often getting converted to open intervention and an increased propensity for iatrogenic bile duct injuries. Our study correlates with this as out of eight patients of bile duct injury five were males, which was similar to Niki Christaou et al [13].

Most patients were posted for surgery in view of bile duct injuries, of them two patients had burst abdomen as an early

major complication (in first 7 days). Anastomotic leak was another major complication seen in patients after 7 days of surgery owing to inadvertent skills and inadequate preoperative optimization of patients. 10% of total patients came back with recurrent symptoms like obstructive jaundice, pain in abdomen, cholangitis and required rehospitalization. All of them required PTBD with balloon dilatation and internal drainage. Overall success rates of this procedure in literature is 66– 76% and has a low procedural morbidity of 11–13% [14,15] making PTBD with balloon dilatation a procedure of choice before considering a surgical revision. In a study done by Kadaba et al [7], 17 patients had early bile leaks (3.7%) and 17 had late strictures (3.7%) at a median period of follow up of 12 months. Zhu et al reported 5% incidence of anastomotic stricture [16]. Stilling et al reported 30% of patients with hepaticojejunostomy site stricture in contrast to 10% in our study [17]. Our study mortality was nil as compared to documented perioperative 30-day mortality of 6.5% in a study done by Kadaba et al [7].

Conclusion

Bilioenteric bypass is the procedure of choice in patients with obstructive jaundice with either benign or malignant cause. ERCP and PTBD play an integral role in preoperative preparation of the patients. Bypass procedures are a domain requiring surgical expertise whether done by open or minimally invasive approach. Bilioenteric anastomoses are seen to have low morbidity and good surgical outcomes. Although there are multiple advanced techniques available, yet surgeon's experience and preoperative optimization of the patient play an important factor in determining the surgical outcomes in these cases.

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