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Choledochoduodenostomy versus T-Tube Drainage in Patients Have Stones in Common Bile Duct with Risk Factors of Post-Operative Missed Stone

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Abstract **Original Research Article**

Background: Common bile duct (CBD) stones that remain after surgery or are missing and ascending cholangitis following CBD exploration are both serious complications of biliary surgery. Both patients and doctors suffer greatly when problems need repeated bile tract procedures. ***Objective:*** To evaluate the Choledochoduodenostomy versus T-tube drainage in patients has stones in common bile duct with risk factors of post-operative missed stone. ***Method:*** This cross-sectional study was carried out at tertiary hospital, Bangladesh from June 2020 to June 2022. Where, 80 patients who compare two methods for surgical management of CBD stones were included as a sample population. Where Group-1 included 40 patients who were managed by CBD exploration followed by insertion of T tube, the risk factors of the incidence of missed retained stone in CBD were multiple stones in CBD and hugely dilated CBD (>15 mm). The second method was choledochoduodenal anastomosis for patients having the same previous risk factors (Group-2) which included 40 patients. ***Results:*** During the study, 50% cases were belonging to 41-50 years and 60% were female. In group-1 abdominal pain was seen 92% cases followed by 93% had jaundice, 25% had Cholangitis, 81% had CBD stones, 93% had abnormal liver function test. Whereas in group-2 abdominal pain was seen 94% cases followed by 97% had jaundice, 27% had Cholangitis, 85% had CBD stones, 96% had abnormal liver function test. In addition, in group-1 9.8% had wound infection, 5% had cholangitis and 16.5% had residual stones. Whereas, in group-2 5% had wound infection, 5% had cholangitis and no one had residual stones. ***Conclusion:*** According to the findings of this study, choledochoduodenostomy is a successful and safe operation for significantly lowering the incidence of missing or residual bile duct stones when compared to biliary drainage using a T tube in the presence of risk factors.

Keywords: Choledochoduodenostomy, T-tube drainage, common bile duct (CBD).

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INTRODUCTION

Choledocholithiasis refers to bile duct stones. Choledocholithiasis is predicted to be present in 1-15% of people with cholelithiasis. Gallstones can enter the common bile duct (CBD) from the gallbladder via the cystic duct. Secondary bile duct stones inside the intrahepatic biliary tree are known as primary hepatolithiasis and can progress to choledocholithiasis [1].

Jaundice and pain in the upper right abdominal region are the most common symptoms, although biliary colic, gallstone pancreatitis, ascending cholangitis, and an increased bilirubin and alkaline phosphatase are also common [2].

Treatment options range from open surgery to laparoscopic cholecystectomy with laparoscopic exploration of CBD to stone extraction by ERCP and laparoscopic cholecystectomy. The diagnosis is usually suspected through clinical evaluation and confirmed by laboratory investigations, ultrasound, magnetic resonance cholangiopancreatography (MRCP), or endoscopic retrograde cholangiopancreatography (ERCP) (diagnostic and therapeutic) [3, 4].

When endoscopic retrograde cholangiopancreatography (ERCP) fails or laparoscopic exploration of the CBD is not an option, open exploration of the CBD is the gold standard. Stone removal from the bile duct involves opening the duct, removing the stone, and then closing the duct with or without a T tube. 4 Although both techniques are successful and safe, complications such as missing or residual stones in CBD, as well as stasis and ascending cholangitis, might arise in the post-operative period. ERCP has the potential to fix these issues, but if it fails to do so, surgery will be required to fix those [5]. There are technical challenges in performing the surgery, which results in increased mortality and extended morbidity.

In this study our main goal is to evaluate the Choledochoduodenostomy versus T-tube drainage in patients have stones in common bile duct with risk factors of post-operative missed stone.

OBJECTIVE

To evaluate the Choledochoduodenostomy versus T-tube drainage in patients has stones in common bile duct with risk factors of post-operative missed stone.

METHODOLOGY

This cross-sectional study was carried out at tertiary hospital, Bangladesh from June 2020 to June 2022. Where, 80 patients who compare two methods for surgical management of CBD stones were included as a sample population.

Where Group-1 included 40 patients who were managed by CBD exploration followed by insertion of T- tube and post-operative T- tube cholangiogram, the risk factors of the incidence of missed retained stone in CBD were multiple stones in CBD and hugely dilated CBD (>15 mm). The second method was choledochoduodenal anastomosis for patients having the same previous risk factors (Group-2) which included 40 patients.

The data were analyzed by SPSS data base with application of Chi-square test and proportion comparison, $p<0.01$ - 0.05 and 95% confidence interval to be significant.

RESULTS

In table-1 shows mean age distribution of the patients where 50% cases were belonging to 41-50 years, 30% cases 51-60 years, 20% cases were in 31-40 years. The following table is given below in detail:

Table-1: Age distribution of the patients

Age distribution	Percentage (%)
31-40 years	20%
41-50 years	50%
51-60 years	30%

In figure-1 shows gender distribution of the patients where female cases (60%) were higher than female. The following figure is given below in detail:

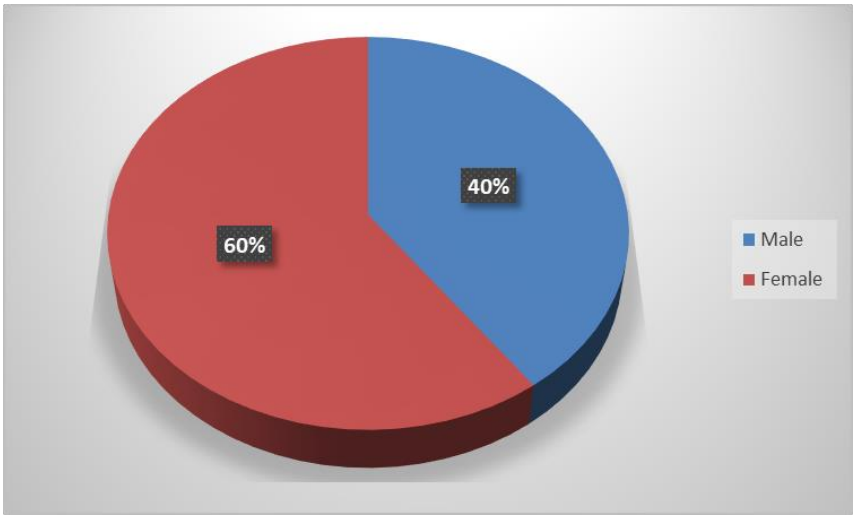

Figure-1: Gender distribution of the patients

In table-2 shows clinical data, sonographic and laboratory distribution where in group-1 abdominal pain was seen 92% cases followed by 93% had jaundice, 25% had Cholangitis, 81% had CBD stones, 93% had abnormal liver function test. Whereas in group-2 abdominal pain was seen 94% cases followed by 97% had jaundice, 27% had Cholangitis, 85% had CBD stones, 96% had abnormal liver function test. The following table is given below in detail:

Table-2: Clinical data, sonographic and laboratory distribution

Clinical data, sonographic and laboratory	Group-1, %	Group-2, %	P value
Abdominal pain	92%	94%	0.35
Jaundice	93%	97%	0.40
Cholangitis	25%	27%	0.43
Dilated CBD	95%	96%	0.51
CBD stones	81%	85%	0.33
Abnormal liver function tests	93%	96%	0.31

*multiple responses were noted

In table-3 shows Postoperative complications where in group-1 9.8% had wound infection, 5% had cholangitis and 16.5% had residual stones. Whereas, in group-2 5% had wound infection, 5% had cholangitis and no one had residual stones. The following table is given below in detail:

Table-3: Postoperative Complications

Complication	Group-1, %	Group-2, %	P value
Wound infection	9.8%	5%	0.52
Cholangitis	5%	5%	0.88
Residual stones	16.5%	0%	0.02

DISCUSSION

Missed or persistent stones in the bile duct following investigation are a disaster for both the patient and the surgeon. There are several discussions on remaining bile duct stones following CBD exploration [10]. In a study of 59 individuals, 14.8% had residual stones following CBD exploration and stone extraction, while 14.8% had residual stones after open CBD exploration with T tube drainage [6]. Harold *et al.*, report 11% leftover stones during CBD stone exploration [7].

Lygidakis *et al.*, colleagues found 20.0% residual stones following traditional CBD investigation and T tube insertion.

If stones from the CBD are not completely removed, the chance of missing or lingering stones in the bile duct increases. Even though choledocoscopy, cholangiography, and T tube drainage were performed, the optimal procedure for completing open bile duct exploration is unknown, and it must include the removal of all bile duct stones with mud irrigation and adequate biliary drainage to avoid stasis. Missed or residual bile duct stone with ascending cholangitis [8].

Whereas in our study, in group-1 16.5% had residual stones which is lower than earlier studies due probably short postoperative follow up period. Prospective analysis of our patients showed that the risk factors responsible for missed or residual bile duct stones incidence were present in most of cases. This is agreed with Moreaux *et al.*, which concluded that the post-operative complications increased with presence of marked CBD dilatation or multiple stones [9].

In addition, in our study statistically choledochduodenostomy procedure showed significant reduction in the incidence of missed CBD stones. Post operatively by comparison of proportion test p-value this agreed a study with Kamran *et al.*, no missed CBD stones incidence in 54 patients managed by choledochoduodenal anastomosis.

It seems that the problem is due to inadequate drainage of bile and addition of choledochoduodenostomy will provides an effective and safe biliary drainage [12].

CONCLUSION

According to the findings of this study, choledochoduodenostomy is a successful and safe operation for significantly lowering the incidence of missing or residual bile duct stones when compared to biliary drainage using a T tube in the presence of risk factors.

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