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Background: This study was aimed at evaluating the trend and outcome of surgical management of choledocholithiasis in St. Paul Teaching Hospital Addis Ababa, Ethiopia.

Methods: This was a clinical based retrospective analysis. The operation register was used to identify the cases that were operated for biliary lithiasis. Their clinical records were obtained from the record office of the hospital and data collected and recorded on a predesigned format. Data was analyzed by SPSS statistical software. Pearson's chi-square test was used for statistical analysis. P-value <0.05 was considered significant.

Results: A total of 1230 underwent open cholecystectomy over 5 year period of which 98 patients were found to have choledocholithiasis constituting 7%. Of the 98 patients who underwent common bile duct (CBD) exploration, the records of 78 patients were found and made the basis of this analysis. Fifty-nine (75.6%) patients were females and 19(24.4%) were males, with a male to female ratio 1: 3. The mean age was 49.15 years. The most common symptoms were right upper quadrant pain and jaundice. The most frequent physical findings was right upper quadrant tenderness. Choledocholithotomy with T-tube insertion was done in 39 patients, side to side choledochoduodenostomy in 34 patients, and hepaticojejunostomy in 5 patients. Twenty-four (71.6%) choledochoduodenostomy patients were discharged in less than ten days after operation while 36(87.1%) of those with T-tube were discharged after 10 days (p<0.019). The re-operation rate was 12.8% for the T-tube insertion group and 2.9% for choledochoduodenostomy patients. There were 3(8.8%) deaths in the former and 1(2.9%) in the group of choledochoduodenostomy. The overall complication rate was 11 (30.6%) for the T-tube insertion and 3 (8.8%) for the choledochoduodenostomies.

Conclusion: Choledochoduodenostomy is a better option than Choledocholithotomy with T-tube insertion in the treatment of choledocholithiasis in African setting. We recommend choledochoduodenostomy (CD) for multiple CBD calculi, big calculi in the CBD, much dilated CBD (>2cm), primary CBD stones, hepatic stones, recurrent stones, and elderly patients where the size of the CBD is 15mm and above.

Introduction

Common bile duct (CBD) stones are detected in 8% to 16% of patients who have cholelithiasis¹. About 500,000 gallbladders are removed in the United States annually. The CBD is explored in nearly one quarter of them, and stones are removed in about two-third of these explorations². A report from Japan indicates that incidence of choledocholithiasis is even higher occurring in 18.5% of patients operated for cholelithiasis³. Biliary lithiasis is not uncommon in the developing world too. A report on pattern on admission to the surgical department of Tikur Anbessa hospital (TAH)⁴ revealed that cholelithiasis and its complications accounted for 10% of the whole admission and 25.9% of GI conditions.

Bekele⁵ reported overall 12.35% of CBD exploration in 712 cholecystectomies in Ras Desta hospital, Addis Ababa. On another study from the same hospital, Choledocholithiasis accounted for 41% of obstructive jaundice cases⁶. A study from Tikur Anbessa hospital revealed that CBD stone was found in 8% of 745 patients who underwent Cholecystectomy for cholelithiasis⁷. The traditional open surgical management of CBD stone is choledochotomy and stone removal with T-tube placement, which may be kept for a minimum of 10 days before removal provided that complete evacuation of the stone is ascertained¹. Sides to side choledochoduodenostomy and

transduodenal sphincteroplasty are other options with their own indication and contraindications⁸.

Since 1891, when Sprengel did the first side to side choledochoduodenostomy, choledochoduodenostomy (CD) has had varying degrees of popularity because of possible complications such as recurrent abdominal pain or cholangitis which has been termed as the "sump syndrome"^{9,10}. However, the recent trend is that surgeons in America, Europe and else where have shown interest in the procedure after analyzing its favorable long term outcome and clearly the indications for constructing^{3,10,11,12,13}. There are no studies done in Ethiopia in line with the practice of CD. This retrospective study is undertaken to assess the pattern and outcome of surgical management of choledocholithiasis and compare the pitfalls of the different procedures used in one of the tertiary level hospitals in the capital city, Addis Ababa, Ethiopia.

Material and Methods

Saint Paul's hospital is a tertiary level hospital in Addis Ababa, Ethiopia, with 130 surgical beds. The study is a clinical based retrospective analysis covering a period of five years from January 1st 1994 to December 30 1999. The operation registry book was used to identify the cases that were operated for biliary lithiasis. Then the records were obtained from the record office of the hospital and data were collected in a predesigned format.

A total of 1230 patients underwent Cholecystectomy during the study period among which 98(7%) had choledocholithiasis. Of the 98 patients with choledocholithiasis the records of 78 (79%) patients could be retrieved and made the basis for this study. Included variables were, Socio-demographic data, preoperative diagnosis, intraoperative findings and the type of procedure, postoperative hospital stay, complications and follow-up course. Data was analyzed by SPSS statistical software. Pearson's chi-square test was used for statistical analysis. P value <0.05 was considered significant.

Results

During the study period, 1230 patients underwent surgery for cholelithiasis among which 98(7%) had choledocholithiasis. The records of 78 (79%) patients was retrieved and made the basis for this study.

Fifty-nine (75.6%) patients were females and 19(24.4%) were males, with a female to male ratio of 3.1:1. The mean age was 49 years with range of 16 to 87(Figure 1). As is shown in Table 1 the most common presenting symptoms were right upper quadrant pain, jaundice, fat indigestion in 76 (97.4%), 51(65.4%), 39(50%) of the cases respectively. Right upper quadrant tenderness and icterus were the most frequent physical signs observed in 58(74.4%) and 41(52.6%) respectively. The laboratory serum bilirubin and transaminase levels along with ultrasound of the abdomen were the diagnostic aid used apart from history and physical findings.

The admission diagnosis of choledocholithiasis with or without jaundice was made in 59 (75%) of the patients. Ultrasound of the biliary tree was the diagnostic facility used to evaluate the CBD. The size of the CBD was recorded in 68 cases and was above 10mm in 62(91%)of the cases. CBD stone was clearly picked on ultrasound in 45/78 (57.7%) (Table 2). The type of the procedure and CBD size is indicated in Table 3. Choledochotomy with T-tube drainage and choledochoduodenostomy were the two frequently performed procedures. Although it seems that bigger duct size might have pressed to do choledochoduodenostomy the distribution is not significantly different.

Table 1. Symptoms and signs of patients operated for common bile duct stones at Saint Paul’s Hospital, Addis Ababa, Ethiopia

Characteristics	Yes	No	Not recorded
Symptoms			
RUQ pain	76(97.4%)	2(2.6%)	-
Jaundice	51(65.4%)	26(33.3%)	1(1.3%)
Fat indigestion	39(50%)	11(14.1%)	28(35.9%)
Dark urine	24(30.8%)	36(46.2%)	18(23.1%)
Clay stool	18(23.1%)	37(47.4%)	23(29.5%)
Pruritis	16(20.5%)	28(35.9%)	34(43.6%)
Fever	22(28.2%)	41(52.6%)	14(17.9%)
Signs			
RUQ tenderness	58(74.4%)	20(25.6%)	-
Icterus	41(52.6%)	36(46.2%)	1(1.3%)
Tachycardia	11(14.1%)	67(85.9%)	-
Fever	7(9%)	70(89.7%)	1(1.3%)
Scratch marks	7(9%)	25(32.1%)	46(59%)

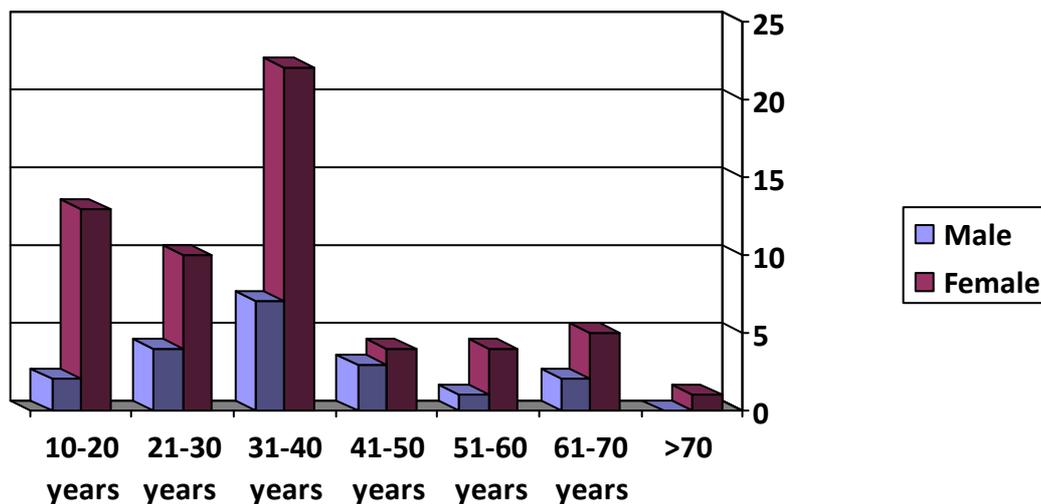


Figure 1. Age and sex distribution of patients operated for common bile duct stones.

Table 2. Association Between Common Bile Duct size and Presence of Stones.

CBD Stone	CBD size					Total
	Normal	Not recorded	< 1cm	1-2 cm	> 2cm	
Yes	-	3	2	31	10	46
No	1	4	10	8	1	24
Not recorded	-	3	-	-	-	3
Inconclusive	-	-	4	-	1	5
Total	1	10	16	39	12	78

Table 3. Common Bile Duct Size versus Procedures Performed.

CBD Size	Procedure Performed			Total
	T- tube	Choledochoduodenostomy	Hepaticojejunostomy	
Normal	1			1
Not recorded	3	5	2	10
< 1cm	10	5	1	16
1-2cm	23	15	1	39
>2cm	2	9	1	12
Total	39	34	5	78

Table 4. Outcome of Patients Operated for Common Bile Duct Stones.

Procedur Done	Post Operative Course				Total
	Smooth	Re-exploration	fever, tachycardia	wound infection	
T- tube insertion	27	5	5	1	38
Choledochoduodenostomy	31	1	2		34
Hepaticojejunostomy	3		2		5
Total	61	6	9	1	77

The type of the procedure and CBD size is indicated in Table 3. Choledochotomy with T-tube drainage and choledochoduodenostomy were the two frequently performed procedures. Although it seems that bigger duct size might have pressed to do choledochoduodenostomy the distribution is not significantly different. The postoperative stay was significantly delayed ($p < 0.019$) for the choledochotomy and T-tube drainage group. Re-exploration rate was also more in the T-tube drainage group. On follow up three of the T-tube drainage and one of the choledochoduodenostomy patients got complicated which deserved re-exploration which is not statistically significant. (Table4).

Discussion

Choledocholithiasis comprised 7% of all cholelithiasis cases which compares well with the 8-16% that is reported in the literature^{1,2,5-7}. The CBD stones are, in most instances secondary to gallstone. Primary choledocholithiasis are found under some circumstances. The high female preponderance observed in our study is a known fact and is in relation with other studies^{1-3, 5,6,7,8,10-12}. Our patients with a mean age of 49 years were younger than found in most studies^{8,10-12} but was similar to what Bekele^{5,6} and Tessema⁷ reported. Our finding of right upper quadrant pain and Jaundice as leading symptoms is in line with other studies^{5,6,7}.

Similarly Icterus and right upper quadrant tenderness were the frequently identified signs, which is in agreement with observations by other investigators^{6,10}. Ultrasonography is said to be unreliable in the detection of stone in the common bile duct¹. In our case it could peak 58 % of

the choledochal stone, which goes with the conclusion reached earlier¹. There still remain controversies, how best to handle choledocholithiasis. The classical CBD exploration and T-tube drainage is accompanied by various complications including incomplete evacuation, bile leak and sepsis and recurrent stone³. On the other hand recurrent choledocholithiasis remains a challenge for both the patient and the surgeon. Recurrence rates as high as 10% have been reported after a second operation on the biliary tract. Sterling had reported that re-exploration of the CBD is associated with a mortality that is twice that for the initial choledochotomy and four times that for an uncomplicated cholecystectomy¹⁴. These facts compelled the surgeons, in different countries; to look for an operative procedure option with minimal postoperative complication and better long term out come with no or little recurrence rate. It was mandatory to revisit side-to-side choledochoduodenostomy, which was abandoned for the fear of sump syndrome⁹. However long term follow up of patients with this procedure could not substantiate the fear^{3,11,14-17}. On the contrary, almost all the studies showed that the immediate postoperative complications were significantly less in the choledochoduodenostomy group as compared to T-tube drainage. The need for re-exploration for recurrent lithiasis was high for the T-tube group. In a recent report by Zhe-Fu Li and Xio-Ping Chen from China, recurrence rate was 8.6% after T-tube drainage while it was only 2.45 after CD (p value < 0.05)¹⁸.

Our observation is in line with these authors. Postoperative stay was significantly delayed in those with T-tube drainage (P value < 0.019). Re-exploration in the early postoperative period was also more for the T-tube drainage group though not statistically significant. On long term follow up, too, more complication was noticed for T-tube drainage. This observation definitely favors Choledochoduodenostomy for surgical management of properly selected cases of common bile duct stones. The indications to do CD include Size of CBD, ampullary stenosis, multiple calculi, retained or residual stone, hepatic stones, distal CBD stricture, recurrent common duct stone, impacted ampullary stone, primary common duct stones etc⁸.

Most authorities in the field recommend a CBD size of 15mm and above¹⁰⁻¹⁷. Some believe that CD can safely be done with CBD size as small as 10 mm. In our case we noticed that CD was performed even in CBD sizes less than 10 mm. Most of our patients had smooth postoperative course and had no significant complication on further follow-up. One may be tempted to conclude that CBD size might matter little. However, as it is technically demanding and inconvenient we don't recommend doing CD where the size is less than 10 mm. It would rather be advisable to stick to a size of 15mm and above.

Conclusion

In conclusion this study has shown that side-to-side CD is a better alternative procedure with less early and late complication. We recommend it for multiple CBD calculi, much dilated CBD (2cm), big stone in the CBD, Hepatic stone, recurrent stone, Primary CBD stone and elderly patients where the size of CBD is 15mm and above.

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