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Choledochoduodenostomy as a Permanent Biliary Drainage in Choledocholithiasis

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Abstract

The study was done on twenty four patients with clinical data suggesting calcular obstructive jaundice. Liver function tests, plain X-ray on the abdomen, abdominal ultrasonography and ERCP were done for each patient. Choledochoduodenostomy has been performed and postoperative follow-up was done (the mean length period was one and half year). The results of our study were favorably compared with the results of other studies.

Introduction

CHOLEDOCHODUODENOSTOMY is an anastomosis between the anterior surface of the common bile duct and the posterior surface of the adjacent duodenum [1]. It was first performed by Riedel in 1888. The first successful lateral choledochoduodenostomy was performed by Sprengel in 1981.

From purely anatomic point of view, the choledochoduodenostomy bypasses all the obstructive problems in the retro-duodenal, transpancreatic and intra-mural

segments of common bile duct and it offers a wide ostium for the spontaneous passage of reformed or residual calculi without the risk of operatively induced pancreatitis [2]. So, the indications for choledochoduodenostomy are multiple common bile duct calculi, papillary stenosis, impacted distal stone, residual stones, intrahepatic calculi, primary common bile duct stones, dilated common bile duct without stone, narrow distal common bile duct segment, low iatrogenic stricture and duodenal atresia. However, choledochoduodenostomy is contraindicated in certain

cases, e.g., non-dilated common duct, sclerosing cholangitis, malignant obstruction and significant duodenal edema or inflammation [3].

The principal objection of choledochoduodenostomy was the apprehension that the reflux of gastrointestinal contents into the biliary tree would produce ascending cholangitis [4]. Reflux of duodenal contents into the biliary tract has been the presumed cause of cholangitis based on this presumption. However, an adequate sphincteroplasty also allows reflux of duodenal contents into the biliary system with sequel, unless a stricture develops. Therefore, it is not reflux of duodenal contents but anastomotic stricture and subsequent stasis that are responsible for cholangitis. This is equally true for sphincteroplasty, choledochoduodenostomy and choledochojejunostomy. Recurrent cholangitis usually heralded the development of the anastomotic stricture [5].

Another objection to the use of choledochoduodenostomy and choledochojejunostomy in patients with non malignant biliary tract disease is the creation of a blind segment or pouch between the anastomosis and the ampulla of Vater [4]. Choledochoduodenostomy has been accused of causing chronic atrophic gastritis. Delikaris [6] speculated that something other than the choledochoduodenostomy might be responsible for the gastritis, possibly

the cholecystectomy that is almost invariably performed with or before the choledochoduodenostomy.

Patients and Methods

Twenty four patients were included in this study. They were admitted to the Department of Surgery Al Hussain University Hospital. They were presented clinically by a picture suggesting calcular obstructive jaundice. Most of the patients had past history of jaundice and only some were presented by a picture suggesting acute cholecystitis. The age and sex ratio are summarized in table (I).

Table (I): Data of Patients.

Total number of patients	24
- Females	14
- Males	10
Ratio of females to males	1.4:1
Range of age (years)	32-66
Mean of age (years)	50

Clinical examination and biochemical studies including liver function tests were done for every case. Radiological studies including plain X-ray abdomen, abdominal ultrasonography and endoscopic retrograde choledochoduodenostomy (ERCP) were done for each patient.

The indications for choledochoduodenostomy among those patients and its percentage are summarized in table (II).

Table (II): Indications for Choledochoduodenostomy and its Percentage.

Indication	Number of patients	%
Muliple stones or sludge	14	58.3
Hepatic duct stone	2	8.3
Complete clearance uncertain, C.B.D. > 18 mm	8	33.3

So, the most frequent indication was biliary obstruction by multiple duct stone or sludge (Fig. 1)



Fig. (1): ERCP showing enormously dilated C. B. D. with multiple stones in the duct and gall bladder treated by cholecystectomy with choledochoduodenostomy.

Finally, exploratory laparotomy was done to assess the condition of the biliary tract and related organ and to do the treatment policy at the same time. Cholecystectomy and choledochoduodenostomy were done for every patient. Jaundiced patients had vitamin K 10 mg every 12 hours several days before operation, and diuresis was induced by administration of 100 ml of 10% manitol intra-operatively. All the patients had velosef 500 mg every 6 hours one day before the operation and five days postoperative.

Only twenty patients (83%) were available for follow up, and the mean length period was one and half year.

Results

Postoperative complications which occurred among our patients can be classified into minor and major.

The minor complications were chest infection in two patients, wound infection in four patients and minor biliary leak in two patients. This minor biliary leak occurred in the second postoperative day and healed spontaneously by the sixth postoperative day. So, the minor complications occurred in eight patients (33%). Cholangitis was the major complication occurring postoperatively. It occurred in two patients (8%) about one year after operation and was treated medically. There was no deaths among our patients and the mean postoperative hospital stay was 13 days.

Barium meal radiography performed one month after operation revealed patency of the anastomosis in all patients without any undue stenosis. The anastomosis was considered patent if barium visualized the biliary tree.

Liver function tests were done for all the twenty patients every month for three months and then every three months for the follow up period. The mean values were within normal limits although the two patients who had cholangitis showed increased values after one year then returned to the normal values again after conservative treatment (Table III).

De La Cuadra [7] had classified the long term results into good, fair and poor. Good was defined as occasional and minor gastrointestinal upset or wound imperfection with normal liver function tests. Fair was defined as significant complaints, such as those attributed to the sump syndrome, cholangitis, abnormal liver function test results or endoscopic evidence of pathologic enterogastric reflux that could be documented. Poor was defined as residual or recurrent stones, jaundice and severely disturbed liver function test results requiring reoperation. According to this classification the results of our study can be summarized as in table (IV).

Table (III): Liver Function Tests for the Twenty Patients with Choledochoduodenostomy.

	Mean	Range	Normal level
S. Bilirubin	1.1	0.6-2.3	< 1 mg%
Alkaline phosphatase	9.7	4-29	3-13 K.A.U
S.G.P.T	21	5.52	Up To 45 U/L
S.G.O.T	19	4.64	Up to 40 U/L

Table (IV): Classification of the Long Term Results of the Twenty Side to Side Choledochoduodenostomy.

Classification	Number of patients	%
Good	18	90
Fair	2	10
Poor	0	0

Discussion

Gall bladder is the main source of common bile duct stones, but stasis plays the major role in primary bile duct stones formation. So, removal of bile duct stones and correction of bile stasis (Whatever its cause) are the essential lines to get adequate treatment. Prevention of further new stones formation is the most important point in the treatment, so the surgeon

should consider if there is biliary mud, multiple duct stones or papillary stenosis and an additional procedure is essential to drain the bile duct for prevention of further stones formation. All the methods of permanent biliary drainage should be considered complementary to each other and not competitive. So, the preference to choledochoduodenostomy, choledochojejunostomy or sphincteroplasty is dictated by the circumstances of the particular case and experience of the surgeon [5].

For the multiple and retained stones with dilatation of common bile duct (more than 18 mm), choledochoduodenostomy was the preferred method, but it was not performed as the primary procedure in conjunction with a common duct exploration unless an intra-hepatic stone was left behind or the bile ducts were filled with sludge [8].

For treating recurrent bile stones, sphincteroplasty is preferred by many surgeons to choledochoduodenostomy [9]. But in our study, we preferred choledochoduodenostomy for non impacted bile duct stone. Minimum manipulation to pancreatic duct, technical ease, less time consuming, all vote in the favour of choledochoduodenostomy, e.g. dilated bile duct, wide anastomosis (at least 2.5 cm) and placing the anastomosis as distal as possible in the common bile duct.

On the other hand, choledochoduodenostomy is also preferred to choledocho-

jejunostomy by many surgeons in cases of stricture, dilatation or thickening of common bile duct, while it is contraindicated in cases of scarring of duodenum or impending duodenal obstruction [5].

Our results were favorable compared to those of other studies. While Thomas et al [10] reported an incidence of 1% post-operative pancreatitis, no patient had pancreatitis after choledochoduodenostomy in our study. Cholangitis is the major complication. It was reported in 0.4% in Madden's big series [11], while Baker et al [8], reported an incidence of 1%. The incidence was about 8% in our study and occurred one year after operation. The low incidence in other series may be due to the greater number of patients than ours. Anastomotic stricture with subsequent stasis and not the reflux of duodenal contents which is responsible for cholangitis [5,12].

Few cases of sump syndrome were reported by Vogt and Hermann [5], but none occurred in our study.

Retained or residual stones did not occur in our study while 4% of Capper's patients with choledochoduodenostomy had residual or retained stones [13].

While no deaths were recorded in our study, the mortality rate after choledochoduodenostomy was reported 3% by Madden et al [11] and 4% by Peel et al [14].

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