



Paediatric Surgery

HEPATICODUODENOSTOMY IN CHOLEDOCHAL CYST PATIENTS AS AN ALTERNATIVE TO ROUX-EN-Y HEPATICOJEJUNOSTOMY FOR BILIARY ANASTOMOSIS IN PAEDIATRIC PATIENTS (1-12 YEARS AGE GROUP)

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ABSTRACT

Background - The conventional treatment of choledochal cyst includes Roux-en-Y hepaticojejunostomy after excision of choledochal cyst for biliary reconstruction. Hepaticoduodenostomy, a newer approach for biliary reconstruction in which normal bowel continuity remains and requires only one anastomosis. We studied the technique of hepaticoduodenostomy as an effective alternative to Roux-en-Y hepaticojejunostomy. **Aim and Objective** - The aim of the study was to evaluate the efficacy and complications of hepaticoduodenostomy in the treatment of choledochal cyst in paediatric age group. **Material and Methods** - A total 30 paediatric age group Patients of choledochal cyst who were admitted and operated by hepaticoduodenostomy technique in the last two and half years in our institute were included in this study. **Results** - From 30 patients 16 (53.34%) were girls and 14 (46.67%) were boys. The mean age of patients was 6.5 years. Average time taken for surgery was 91.7 minutes. Post operative period was uneventful in most of the patients. Two (6.67%) patient underwent anastomotic leak and was managed conservatively without any surgical intervention. Two (6.67%) patients presented with cholangitis which was managed without any surgical intervention. One patient developed mild pancreatitis which was managed conservatively. The average length of postoperative hospital stay was seven days, none of them have biliary stricture or biliary fistula. **Conclusion** - Hepaticoduodenostomy in paediatric age group choledochal cyst patient is a safe and efficient alternative over Roux-en-Y hepaticojejunostomy with less operative time and less morbidity and mortality.

KEYWORDS : Choledochal cyst, Hepaticoduodenostomy, Hepaticojejunostomy

INTRODUCTION

Choledochal cyst is a congenital biliary tract anomaly. As per Todani's classification, types 1 and 4A are treated with excision and biliary tract reconstruction. Roux-en-Y hepaticojejunostomy requires two anastomoses, resulting in a higher incidence of adhesive bowel obstruction. Long-term follow-up has shown a significant incidence of late complications, namely anastomotic stricture, cholangitis, peptic ulcer, fat malabsorption, diarrhoea, and malnutrition. Hepaticoduodenostomy is simpler to perform, and is associated with fewer complications such as adhesive bowel obstruction, anastomotic leakage, and peptic ulcer as compared with Roux-en-Y hepaticojejunostomy¹. Hepaticoduodenostomy requires less operative time, allows faster recovery of bowel function, and produces fewer complications requiring reoperation². Some surgeons prefer Roux-en-Y hepaticojejunostomy since studies have shown a high incidence of endoscopy-proven bilious gastritis secondary to duodenogastric reflux after hepaticoduodenostomy³, and they feel that the reflux of duodenal contents (including activated pancreatic enzymes) into the intrahepatic bile ducts through the hepaticoduodenostomy anastomosis may be hazardous to the bile duct mucosa, causing hilar bile duct carcinoma⁴. Our study didn't encounter any such complication. We retrospectively studied our pediatric age group patients who underwent this procedure over a period of two and half years to evaluate the efficacy of this technique.

MATERIAL AND METHODS

All pediatric aged patients with choledochal cyst undergoing surgery in our institute during the period 2021 -2023 were included in the study. The diagnosis and the anatomical details of the biliary tree were delineated by using USG whole abdomen, Contrast Enhanced Computed Tomography of the abdomen, Magnetic resonance cholangiopancreatography. The children who had cholangitis at admission were first treated for the same, followed by surgery after 2-3 weeks of completion of antibiotic course. All patients underwent open surgery with a right subcostal incision. The gall bladder was initially dissected up to Calot's triangle. The choledochal cyst was mobilized all

around and its lower end was disconnected. Proximal dissection was done until the confluence of the hepatic ducts, followed by complete excision of the cyst. The duodenum was kocherized and opened at the junction of the first and second part in the superolateral wall. The anastomosis was done in a single layer by Polydioxanone absorbable suture, starting posteriorly, wherein interrupted sutures were taken with knots inside. The anterior layer completed using interrupted sutures with the knots outside. Care was taken to ensure that the anastomosis was wide and not under any tension. A drainage tube placed intraperitoneally and a Ryle's tube in the stomach. Postoperatively, the patients were started on feeds on the third or fourth postoperative day when Ryle's tube outputs decreased. The intra-abdominal drains were removed within a week and the patients were discharged by about the 7th or 8th day with sutures removed. The follow-up protocol included assessment of symptoms, and investigation with liver function test and an ultrasound of the abdomen at 2nd, 6th month, and then yearly for all patients.

Inclusion Criteria

All patients in the age group of 1-12 years who diagnosed with choledochal cyst and underwent surgery by hepaticoduodenostomy were eligible for this study.

Exclusion Criteria

Patients who didn't give consent for the surgery.

RESULTS

A total of 30 patients were included in the study, in which 16 (53.34%) were girls and 14 (46.67%) were boys. The youngest patient operated upon was 2 years old; the mean age of patients was 6.5 years. Complete excision of cyst done in all 30 patients. At surgery, One patient was detected to have an accessory right hepatic originating from the common hepatic duct and was managed with a wide anastomosis with inclusion of the insertion site of that accessory duct. After complete excision hepaticoduodenostomy was performed. Average time taken for surgery was 91.7 minutes. Post operative period was uneventful in most of the patients. From 30 patients, Two patient underwent

anastomotic leak which was detected on 11th and 14th postoperative day respectively and was managed conservatively without any surgical intervention. 2(6.67%) patients presented with cholangitis which was managed without any surgical intervention. One patient(3.33%) developed pancreatitis which was managed conservatively. One patient(3.33) developed stitch line infection. Mean time of starting feeds was the third postoperative day. The average time of drain removal was the sixth postoperative day. The average length of postoperative hospital stay was seven days. The patients are on regular follow-up and none of them have biliary stricture or biliary fistula.

DISCUSSION

Roux-en-Y hepaticojejunostomy was considered as an ideal technique for repair of choledochal cyst, but hepaticoduodenostomy has gained wide acceptance and favored by many open as well as laparoscopic surgeons because of its advantages over hepaticojejunostomy^{5,8}. There are advantages and disadvantages to both these procedures. The Roux-en-Y hepaticojejunostomy requires two anastomoses, longer operative time, and if postoperative endoscopic stenting required would not be possible. A segment of the jejunum is become nonfunctional. Many studies have shown that the complications like anastomotic leak, cholangitis, and fluid collection in the gall bladder fossa in the early postoperative period; late complications like anastomotic stricture, cholangitis, and biliary stone formation were more common in hepaticojejunostomy⁹. Hepaticoduodenostomy solves some of these limitations. It maintains the normal bowel continuity, takes less operative time, and is less tedious because of the requirement of a single anastomosis only. The mean duration of surgery in our series was about 91.7 min. The surgical time was longer in the cases that had dense periportal adhesions and congenital biliary anomalies. The bilioenteric anastomosis was completed quickly and hence helped to decrease the operative time. This is in comparison with the Roux-en-Y hepaticojejunostomy requiring two anastomoses¹⁰. Shimotakahara reported that the incidence of postoperative endoscopy-proven biliary gastritis is greater in patients who have undergone hepaticoduodenostomy¹¹. In our series, one patient had symptom of pancreatitis in the follow-up period and was confirmed by laboratory investigations and was managed conservatively. There is a reported case of hilar cholangiocarcinoma developing in a patient following hepaticoduodenostomy¹². Our series has not reported this till date. There are studies who suggests that, In hepaticoduodenostomy there is reflux and retention of duodenal contents in the biliary tree increasing the chances of cholangitis and stricture formation¹¹. However, in our opinion, if the anastomosis is made wide, there is adequate emptying of the duodenal contents from the biliary tree, which obviates the chances of cholangitis. The importance of a wide anastomosis has also been stressed by Todani¹³. The minimum diameter should be three cm, as recommended by Tao¹⁴. In our study, two(4%) patient developed an anastomotic leak. Two(4%) patients developed cholangitis, one patient had pancreatitis and one patient developed stitch line infection and having no mortality which shows better morbidity and mortality than hepaticojejunostomy¹⁵. Hence, we recommend the use of this technique in the treatment of choledochal cyst.



Fig1. Showing common hepatic duct after complete excision of cyst. (Blue arrow showing common hepatic duct and yellow arrow showing mobilised duodenum)

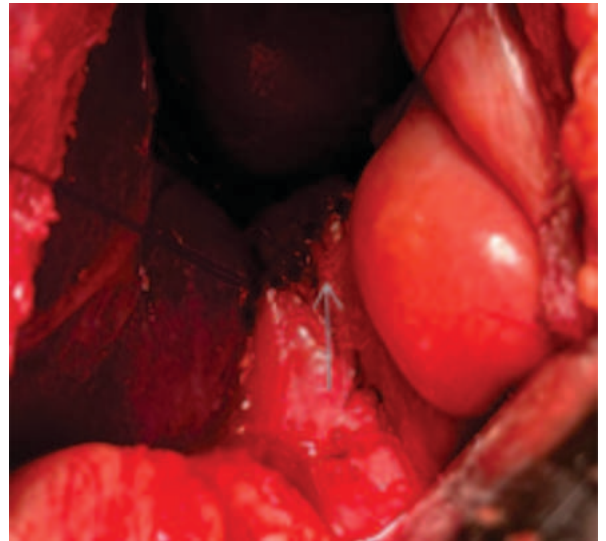


Fig2. A picture taken after Hepaticoduodenostomy anastomosis (Green arrow showing anastomosis of hepaticoduodenostomy).

CONCLUSION

Hepaticoduodenostomy in paediatric age group choledochal cyst patient is a safe and efficient alternative over Roux-en-Y hepaticojejunostomy with less operative time and less morbidity and mortality.

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