

Hepaticojejunostomy  
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Hepaticojejunostomy stricture development after hepaticojejunostomy for biliary diseases is one of the difficult and serious complications of biliary surgery. Untreated stricture is associated with jaundice, recurrent cholangitis, intrahepatic stone formation, and end with secondary biliary cirrhosis which may need liver transplantation.

Case reports: seven patients presented to our hepatobiliary unit at King Hussein Medical Center with benign hepaticojejunostomy stricture between January 2016 and May 2017, two patients following choledochal cyst excision and five patients following common bile duct injury. The main symptoms was jaundice followed by cholangitis. Patients were admitted and managed with intravenous antibiotics and intravenous fluid. All patients underwent transabdominal ultrasonography and MRCP. The seven patients initially underwent an endoscopic retrograde cholangiography using double-balloon enteroscope, all was unsuccessful due to the sharp angle between the jejunal limb and the biliary tree. Percutaneous transhepatic cholangiogram performed to all patients and failed to cannulate the stricture after 1-3 trials in five patients and due to the presence of intrahepatic stone in two patients. Surgical intervention was performed and after patients consented to the new procedure.

During the operation, we performed a 5 cm longitudinal incision at the jejunal limb about 3 cm below the anastomotic edge, then the narrowed anastomosis is cannulated with a 4 or 5 French catheter after dilatation with a Watson Cheyne dissector with fine probe, an intraoperative cholangiogram performed to delineate the biliary anatomy, two 5-0 or 4-0 Polydioxanone suture placed at the edges of the catheter at 9 and 3 o'clock position, an

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incision made in between at 12 O'clock for 3-5 mm with traction applied on the lateral sutures, several stitches then placed between the wall of the CBD and the jejunal mucosa using the same suture material, the incision then further extended in the similar manner until the dilated part of the common hepatic duct reached and extended for another 5-7 mm with multiple sutures placed every 2-3 mm, extension at the left duct needed in one case for around 1cm because of the extension of the stricture to confluence of the bile ducts. Biopsy is always taken from the incision site by scalpel and send for frozen section to rule out malignancy. Jejunal wall closed in two layers and the abdomen is closed without drains. The seven patients postoperative course were uneventful, and discharged home at the third day postoperative, they were followed with liver enzymes and transabdominal ultrasonography at 2 weeks, 3 months and every six months for 18 months and shows normal liver enzymes and patent anastomosis.

**Discussion and conclusion** Bilioenteric bypass surgery is performed to establish the biliary flow in patients with benign and malignant biliary diseases involving extrahepatic biliary tract and include operative and traumatic biliary tree injuries, obstruction and congenital anomalies.

The most common causes of extrahepatic biliary obstruction is chronic pancreatitis, cholelithiasis and choledocholithiasis, primary sclerosing cholangitis, Radiation-induced strictures, drug induced stricture, biliary infections, periampullary tumors and carcinoma of head of pancreas.

(1) Several bilioenteric bypass procedures available depending on the pancreaticobiliary pathology, however, Roux-en-Y Hepaticojejunostomy or choledochojejunostomy are considered as the procedures of choice. (2, 3,

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4) Bilioenteric stricture post bilioenteric bypass procedures is a rare complication, however when biliary stricture occurs and left untreated it results in a significant morbidity and mortality secondary to recurrent cholangitis, liver abscesses, liver cirrhosis, portal hypertension and hepatic failure.

The incidence of Bilioenteric stricture ranges from 4-10% according to several studies. (5, 6, 8) Bilioenteric stricture development is related to many factors such as small duct at the time of bypass, technical issues, bile leak, infection (abscess formation or recurrent cholangitis), and ischemic insult to the bile duct. (7) The initial management in most of the cases is endoscopic and percutaneous endobiliary balloon dilatation with stenting of the stricture site. Surgical intervention is reserved for failed endoscopic or radiological approaches.

The advantage of this technique is its simplicity, which eliminates the need for hilar dissection or dissection through the dense fibrosis that may occur from previous surgery or recurrent cholangitis, also in the cases of portal hypertension with extensive varices that may result in severe bleeding secondary to variceal or portal vascular injury during redo hepaticojejunostomy. Another advantage of this procedure is that it can be applied to long strictures and strictures close to the confluence, with preservation of the biliary length in case of recurrence of the stricture, also theoretically speaking the blood supply to the bile duct remains intact as the incision is made at the anterior aspect of the duct which may result in less blood compromise to the biliary system. In conclusion, this new simple procedure and its promising results may replace a more sophisticated procedure for the management of benign hepaticojejunostomy strictures.

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Further studies consisting of large patient populations are needed to reach a definite conclusion.