

Long-term curative effects of combined hepatocholangioplasty with choledochostomy through an isolated jejunum passage on hepatolithiasis complicated by stricture

Yong Li, Jun Cai, An-Tao Wu and Zi-Jian Wang

Nanchang, China

BACKGROUND: Hepatocholangioplasty combined with choledochostomy was designed through an isolated jejunum passage in 1988. This study was undertaken to evaluate its long-term curative effects in 163 patients.

METHODS: The 163 patients with hepatolithiasis complicated by stricture were treated with this procedure from 1988 to 2003.

RESULTS: Among these patients, 19 patients with postoperative hepatolithiasis complicated by acute cholangitis were treated successfully with percutaneous paracentesis drainage through the isolated jejunum passage and without operation, 36 patients had postoperative residual or recurrent stones (35 patients had stones removed through the stoma and one underwent relaparotomy because of stenosis of the common bile duct along with stone in canceration). The clearance rate of stones after the isolated jejunum passage was 97%; 35 patients (21%) complicated with stricture due to hepatolith were treated with combined hepatocholangioplasty and choledochostomy. Follow-up for 1 to 15 years showed no recurrent stricture of the biliary tract. The operation also successfully prevented reflux cholangitis and other serious complications after Roux-en-Y cholangio-jejunostomy.

CONCLUSION: Hepatocholangioplasty combined with choledochostomy through an isolated jejunum passage may significantly improve the long-term curative effects of hepatolithiasis with stricture.

(*Hepatobiliary Pancreat Dis Int* 2005; 4: 64-67)

KEY WORDS: cholelithiasis;
hepatocholangioplasty;
choledochostomy

Introduction

There are still many problems up till now in the surgical treatment on hepatolithiasis, especially the high occurrence of postoperative residual and recurrent stones, recurrent cholangitis, stenosis of the anastomosis, which usually induce to relaparotomy.^[1-4] Directing against these problems, the authors designed the hepatocholangioplasty and choledochostomy through an isolated jejunum passage in 1988,^[5] which is to build a potential and permanent passage from the outside of the body to the biliary tract. The target of this operation is to simplify the treatment of postoperative residual and recurrent stones, to prevent postoperative complications, to reduce the relaparotomy rate and ultimately get to the target of improving the long-term curative effects. From 1988 to 2003, we had treated 163 patients with hepatolithiasis, some of them were complicated by stricture and clinical curative effects were proved satisfactory after a 15-year follow-up.

Methods

Patients

Of the 163 patients, 66 were men and 97 women, aged from 21 to 74 years (mean 41.2 years). Intrahepatic stones and intra-extrahepatic stones were found in 80.3% of the patients, and hepatolithiasis complicated by stricture in 41.7%, in whom, the stricture of 1-3 level intrahepatic bile-ducts accounted for 28.2%, and the stricture of extrahepatic biliary ducts (including the stricture of the confluence of right and left hepatic ducts), 13.4%. In this group, 61.9% patients had simple hepatolithiasis, which was treated with choledochostomy, 26.9% patients had hepatolithiasis complicated by stricture, which was treated with both hepatocholangioplasty and choledochostomy through an isolated jejunum passage. Of these patients, 14.7% had stones in multiple intrahepatic bile ducts, which were treated by the removal of the left half of the left lobe or irregularly the

Author Affiliations: Department of General Surgery, First Affiliated Hospital of Jiangxi Medical College, Nanchang 330006, China (Li Y, Cai J, Wu AT and Wang ZJ)

Corresponding Author: Yong Li, MD, Department of General Surgery, First Affiliated Hospital of Jiangxi Medical College, Nanchang 330006, China (Tel: 86-791-8623406; Email: jiangyipuyai@163.com)

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right half of the liver as well as the reported hepatocholangioplasty and choledochostomy.^[6-8]

Surgical techniques

After the bile ducts were incised and the stones were removed, an isolated jejunum of 8-10 cm along with a mesentery segment about 20 cm away from the treitz ligament was cut off and were penetrated into the mesentery of the transverse colon after being disinfected and raised above the transverse colon. The isolated jejunum had a clockwise rotation of 180°, which made the distal end close to and anastomosed to the ductus hepaticus. When the bile ducts became strictured, they were incised for reconstruction before anastomosis. One layer interrupted suture was used by mucous-membrance-to-mucous-membrance with the knots outside of the mesentery. 0-1 size silk thread or absorbable suture were used. The proximal end of the isolated jejunum were sutured after an emulsion tube was placed in it. Then it was fixed under the skin of the abdominal nick before the end of the operation. Up to this point a potential passage from the subcutaneous tissue to the biliary tract was built. The cut jejunum was end-to-end anastomosed to rebuild the normal passage. At the same time the mesentery of this jejunum was fixed on the mesocolon transversum in order to avoid the pulling force of the isolated jejunum.

To extract the residual and recurrent stones through the biliary stoma, a 3-cm incision was made at the end of the passage (the jejunum wall) under skin, and the choledochoscopy was stretched to observe the biliary tract through the stoma. After the stones were localized they were removed by lithotomy forceps or by finger. Then, the biliary tract was washed with physiological saline, and an emulsion tube was inserted through the second nick in the jejunum wall besides the first nick, in an attempt to prevent infection, and then the jejunum and skin incision were sutured respectively with catgut suture or silk thread.

Results

In this group, 88.9% of the patients were followed up for 1-15 years (mean 10 years). In the followed up patients, 22% showed clinical symptoms. Among them, 22 patients had abdominalgia, 8 swell in the jejunum passage, 2 diarrhea, 2 incisional hernia, and 2 abdominalgia with hematochezia, but no patient developed reflux cholangitis, peptic ulcer, syndromes of the cecum or other important complications.

In this group, residual (12.8%) or recurrent (9.2%) stones were found in 36 patients. Residual stones were found by postoperative radiography in 6 patients and 30 patients showed residual or recurrent stones in 2 months to 13 years after discharge; 19 of the 30 pa-

tients showed symptoms of acute obstructive cholangitis, including abdominal pain, fever, icterus and painful swelling at the abdominal surface to the biliary stoma. As soon as admission, these patients were treated with percutaneous paracentesis to lay a tube for continuous drainage of bile. After drainage, the symptoms and signs were relieved or disappeared soon and emergency operations were avoided. In the 36 patients, 35 (96%) showed clearance of stones through the stoma, and 1 patient (4%) showed stones again because of stenosis of the common bile duct associated with stone incarceration. The patient was then subjected to laparocholangiotomy for removal of stones and modified Roux-en-Y cholangio-jejunostomy. The patients who had been subjected to stone removal by one operation accounted for 74.2% of the cured patients, and by 2-3 operations 25.7%. The time from the first operation to stone removal was in 2-3 weeks in 6 patients, 1 year in 12, more than 2 years in 18, and 13 years and 2 months in 1. The shortest time was only 17 days, and the mean time 4 years and 1 month.

Discussion

Because of the complicated pathogeny and pathological changes of hepatolithiasis, the incidence of postoperative residual stones is as high as 30% to 74.4% in the patients who need one or more operations^[8-12] despite the techniques for the diagnosis and treatment of this disease have been improved.^[13-18] The reported procedures of hepatocholangioplasty and choledochostomy through an isolated jejunum passage have provided a convenient way to remove residual or recurrent stones after operation. Our clinical experience indicated that most of residual or recurrent stones after operation could be removed through the tunnel of the biliary stoma without incision of the bile duct by laparotomy. This method is more advantageous than the traditional one. The stones are removed under local anesthesia or under epicural anesthesia, if the patient is not cooperative. The stones can be removed from the bile duct only by incising the skin for 3 cm and the end of the subcutaneous biliary stoma. This procedure is suitable for critically ill patients, since it is not involved in the abdominal cavity and the bile duct and almost no blood is lost. Whenever residual or recurrent stones are found postoperatively, they can be removed through the tunnel of the biliary stoma to obliterate obstruction timely. In this group, the clearance rate for residual or recurrent stones was 97%, which was due to additional postoperative lithotomies through the biliary stoma.^[19-21]

Hepatolithiasis associated with stricture is mainly treated by Roux-en-Y cholangio-jejunostomy.^[22,23] Which may damage the normal structure and physiological function of the bile duct, change the acid alkali environment

of the upper digestive tract. The resultant complications include reflux cholangitis, peptic ulcer and cecal syndromes.^[24-26] Since the 1970s, Roux-en-Y cholangio-jejunosomy has been improved on the basis of Roux-en-Y cholangio-enterostomy (or internal drainage), but the result is not satisfactory.^[27-29] The choledochostomy we used is beyond the frame of Roux-en-Y cholangio-enterostomy, and is characterized by preservation of the normal structure and function of the biliary tract, including the Oddi sphincter's function in regulating the flow of bile and pancreatic exocrine juice. Thus this operation can avoid reflux cholangitis, peptic ulcer, cecal syndrome and other complications. Hepatochoangioplasty combined with choledochostomy, using the subcutaneous tunnel of the isolated jejunum to correct the stricture of the bile duct, is easy to get to the place to perform hepatochoangioplasty. The caliber of the jejunum can be freely adjusted according to the necessity of the plasty, so that it is sure to correct the stricture completely.

The isolated jejunum linked with the biliary tract can not replace totally the function of the lost gallbladder; but it can regulate partially the digestive activity in storage and excretion of bile, and adjust the pressure of the biliary tract. We used the method described by Everson^[30] to measure the condition of filling and evacuation of bile in the passage of 6 postoperative cases by brightness mode ultrasonography randomly. The results showed that the mean volume of the passage was 17 ± 5 cm³ in 12 hours after fasting; the passage began to shrink after fat meal, and the smallest volume was 7 ± 6 cm³ 30 minutes later. The bile ejection fraction was 57%. In addition, cholangiography showed that contrast medium made the passage fill and then shrink quickly, which pressed the contrast medium to flow into the bile duct quickly and spurted into the duodenum. This phenomenon convinced us reasonably that the passage linked with the biliary tract could join the digestive action by regulating the flow of bile in the normal way. Furthermore, when the end of the common bile duct is obstructed, it could increase the storage volume of bile to relieve elevated pressure of the bile duct system, and its regular contraction can compress the duct just like a pump to overcome the pressure of the end of the common bile duct to drain the bile smoothly. This condition may probably help to eliminate small residual stones and prevent from forming recurrent stones.

In short, our 15-year experience has proved that the operation is physiologic and effective in treating hepatolithiasis complicated by the stricture of the biliary tract. It is able to decrease the incidence of residual (or recurrent) stones and the relaparotomy rate after operation, avoid complications caused by Roux-en-Y cholangio-enterostomy, and improve the long-term surgical effects of hepatolithiasis markedly.

Competing interest

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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Received January 6, 2004

Accepted after revision November 3, 2004