

Endoscopic sphincterotomy in the treatment of cholangiopancreatic diseases

Zhi-Hua Li, Min Chen, Ji-Kui Liu, Jun Ding, Jia-Hong Dong

Zhi-Hua Li, Min Chen, Ji-Kui Liu, Jun Ding, Jia-Hong Dong, Institute of Hepatobiliary Surgery of PLA, Southwest Hospital, Third Military Medical University, Chongqing 400038, China
Correspondence to: Dr. Jia-Hong Dong, Institute of Hepatobiliary Surgery of PLA, Southwest Hospital, Third Military Medical University, Chongqing 400038, China. jhdong@hbsky.com.cn
Received: 2004-02-23 Accepted: 2004-04-13

Abstract

AIM: To investigate the therapeutic effect of endoscopic sphincterotomy (EST) in the treatment of choledocholithiasis and stenosing papillitis.

METHODS: A total of 1 026 patients undergoing EST during July 1983 to May 2003 at the institute were retrospectively analyzed. Chronic pancreatitis was diagnosed in 63 (6.1%), cholecystolithiasis and choledocholithiasis in 549 (53.5%), stones in residual biliary duct in 249 (24.3%), stenosing papillitis in 228 (22.2%). In patients with simple stenosing papillitis, most incisions were within 0.5-1 cm in length. As for patients with chronic pancreatitis simultaneously, selective pancreatic sphincterotomy was performed, and incision was within 0.5-0.8 cm in length. For stones less than 1 cm, incision was from 1 to 1.5 cm, and for those larger than 1 cm, incision ranged from 1.5 to 3 cm. For stones more than 2 cm in diameter, detritus basket rather than simple incision was chosen.

RESULTS: Of the 798 patients with choledocholithiasis, 764 (93.5%) had successful stone clearance, 215 (94.3%) out of 228 cases of stenosing papillitis were cured totally, while 63 had chronic pancreatitis developed from stenosing papillitis, 57 (90.1%) had sound remission of symptoms, though membranous stenosis emerged in 13 of 57 which was treated with balloon dilatation. After the operation, only 21 cases (2.1%) had complications such as severe pancreatitis and incision bleeding. None of the patients died.

CONCLUSION: EST is an ideal surgical management with mini-invasion in the treatment of choledocholithiasis and stenosing papillitis.

© 2005 The WJG Press and Elsevier Inc. All rights reserved.

Key words: EST; Cholangiopancreatic diseases

Li ZH, Chen M, Liu JK, Ding J, Dong JH. Endoscopic sphincterotomy in the treatment of cholangiopancreatic diseases. *World J Gastroenterol* 2005; 11(17): 2678-2680
<http://www.wjgnet.com/1007-9327/11/2678.asp>

INTRODUCTION

Endoscopic sphincterotomy (EST) has a good efficacy and mini-invasion when used to treat cholangiopancreatic diseases. During January 1983 to May 2003, 6 247 cases underwent endoscopic retrograde cholangiopancreatography (ERCP) in our hospital, and satisfactory outcomes were obtained in 1 026. Our experience is reported in this study.

MATERIALS AND METHODS

Materials

A total of 1 026 cholangiopancreatic patients were enrolled in this study, including 417 males and 609 females with a mean age of 49 years ranging from 13 to 87. Among them, 725 patients had cholangiopancreatic surgeries, 121 were complicated by heart diseases and 96 by diabetes mellitus.

Sixty-three patients had chronic pancreatitis (6.1%), 549 had cholecystolithiasis and choledocholithiasis (53.5%) and 249 had stones in residual biliary duct including stones in common bile duct in 88 cases after gallbladder excision and 14 cases after cholangioduodenal anastomosis, 228 had stenosing papillitis (22.2%). Because the sphincter of Oddi was impaired when the stones were discharged from the biliary tract, cholangiolithiasis, stenosing papillitis and pancreatitis were the most common diseases found in our study.

Methods

The size of incision was decided by the shape of papilla, the size of stones, and absence or presence of stones in the common bile duct. In patients with simple stenosing papillitis, most incisions were within 0.5 to 1 cm in length. As for patients with chronic pancreatitis simultaneously, selective pancreatic sphincterotomy was performed, and incision was within 0.5 to 0.8 cm in length. For the stones less than 1 cm, incision from 1 to 1.5 cm, and for those larger than 1 cm, incision ranged from 1.5 to 3 cm. For the stones more than 2 cm in diameter, detritus basket rather than simple incision was chosen. In our study, 18 patients (1.8%) had an incision more than 2.5 cm, 39 (3.8%) from 2.5 to 1.5 cm, 476 (46.4%) from 1 to 1.5 cm, 377 (36.7%) from 0.6 to 1.0 cm, and 116 (11.3%) within 0.4 to 0.6 cm.

RESULTS

After EST, all the 1 026 cases underwent cholangiography to evaluate the biliary tract. For the 63 cases of chronic pancreatitis, 55 (87.3%) of them had a sound remission of symptoms. Of the 798 patients with choledocholithiasis,

435 (54.5%) had their stones removed during operation, the stones were disposed from 186 cases (23.3%) and 125 cases (16.8%) in 1 week. So the total rate of stone disposal was 94.1%. There were 52 patients that remained with stones after surgery. Of them, 21 were due to the size of stones being larger than 2.5 cm, 13 due to the stricture length of the distal common bile duct which was greater than 3 cm, and 18 due to the incision limited by the flat-shaped papilla. Stricture was released in 215 (94.3%) out of 228 cases of stenosing papillitis, including 13 appearing membranous stenosis after operation and being treated with balloon dilatation. In the 13 patients without stricture release, stricture segment was beyond the wall of the duodenum in nine cases and duodenal diverticulum papilla was observed in four cases.

After the operation, only 21 cases (2.1%) had complications including one case of severe pancreatitis and one case of duodenal perforation, both of which were cured with draining. Eight cases of massive bleeding and 11 of acute pancreatitis were recovered with conservative methods. None of the patients died.

DISCUSSION

Great progresses have been made since EST was used in surgical treatment in the 1970s, especially in treating cholangiopancreatic diseases. The diseases that once had to be treated with standardized open surgery procedures, can now be treated with the aid of EST. It simplifies the complex surgery procedures, and has little interference with the gastrointestinal system and total body function and ensures better recovery after surgery. So it is an ideal method for cholangiopancreatic patients who are senile or have high risks during operation. Gallbladder stone is commonly associated with secondary choledocholithiasis with a probability as high as 10-20%. Nowadays, most gallbladder stone patients receive laparoscopic cholecystectomy (LC) for stone clearance. The approaches for secondary common bile duct stones are as follows: Cholangiotomy or choledochotomy is performed during LC to take out the stones under the guidance of duodenoscope. EST is carried out before LC. Intraoperative EST is performed to remove common bile duct stones during routine LC^[1]. EST is performed for jaundice because of the discharge of stones due to malconduction during LC. Therefore, the optimal treatment for secondary choledocholithiasis is EPRS.

However, in the case of stones larger than 2.5 cm in the common bile duct, EST is not recommended because of predisposing embedment of stones and incisional bleeding. When secondary choledocholithiasis is complicated by distal strictures of common bile duct, the stricture segment less than 3 cm is required to perform EST since the length of incision is limited by the stricture segment. If not, duodenal perforation might occur^[2].

Relationship between papillary shape incision and efficacy

Based on the shape of papilla, a longer incision can be done for mastoid papilla, and a shorter one for flat-shaped papilla. When EST is being performed, the length of the incision should be determined by the size of papilla to guarantee the therapeutic effect and to reduce the complications. Those

with diverticulum beside papilla get affected after surgery. When papilla is edematous and swollen and the sphincterotome or the probe is hard to be introduced into the bile duct because of acute cholangitis due to stone embedment in the distal bile duct, a needle-like scalpel should be used to make an opening on the projected part of the papilla to remove the stones^[3]. In our subjects, 18 cases (1.8%) had an incision more than 2.5 cm, and the length of incision in 476 (46.4%) of 1 026 cases, was from 1 cm to 1.5 cm, and from 0.6 to 1.0 cm in 377 cases (36.7%). The average length of incision was about 1.0 cm. A larger incision was commonly used in lithiasis cases, and no retrograde bile duct inflammation was observed during our follow-up, which is consistent with other reports^[4]. A short incision was mainly used in cases of stenosing papillitis, sphincter dysfunction, and total invasion of ascarid into bile duct. An incision of less than 0.5 cm in length was sufficient for a Dormia basket to snare ascarid.

Diagnosis and treatment for stenosing papillitis

Abdominal pain after cholecystectomy is mostly caused by postoperative syndrome, that is, sphincter dysfunction, which is characterized by the absence of cold, fever, jaundice, and only episodic upper abdominal pain. In this circumstance it is helpless in almost all cholangiopancreatic examinations, such as ultrasound, intravenous cholangiography, CT and MRI. The following features could be identified with ERCP. Common bile duct is dilated to 0.9-1.2 cm, no negative shadow is seen in biliary tract, contrast medium emptying is delayed to 40-60 min, the distal biliary tract looks like a pressured balloon, and under an endoscope, the papilla is red, mildly swollen, hard to cannulate and easy to bleed. Only a probe can be introduced into the duct, or a needle-like scalpel should be used to cut the project part of papilla (but not the opening). We think the above-mentioned signs and symptoms are caused by stenosing papillitis. If the condition is not controlled in time, the bile duct and pancreatic duct would be blocked. Thus some patients would have regular abdominal pain, and laboratory examination indicates a slight increase of serum and urine amylase during acute elapse, and a mild increase in lactate dehydrogenase and alkaline phosphatase. Thus pancreatitis occurs repeatedly. Only if the stricture papilla is cut to release the pressure in bile and pancreatic ducts, all these symptoms can be remitted. All of these are the indications of EST^[5]. In addition, very few stenosing papillitis patients recur membranous stenosis in the distal bile duct half or one year after the first incision. Balloon dilatation can release the conditions. In our study, 13 patients experienced bile duct dilatation (stenosis of distal bile duct), constriction (after incision), expansion again (membranous stenosis in the distal bile duct), and constriction again (balloon dilatation). Satisfactory outcomes were obtained in all the 13 patients.

Prevention for complications

Besides lower rates of cholangitis and pancreatitis because of the release of obstruction, EST has similar common complications with ERCP. The most severe complications were duodenal perforation and incision bleeding, with a mortality of 1.2-9% as reported^[6-8]. In our study only 21

cases (2.1%) had complications, including one case of severe necrotic pancreatitis and one case of duodenal perforation for emergent operation. Eight cases of massive bleeding and 11 cases of simple severe pancreatitis were recovered with conservative methods. None of the patients died. In order to prevent duodenal perforation, the following points are recommended. Gentle movement and no force are needed when the endoscope is driven across the pylorus. Incision should not pass coronary ligament or a larger incision should not be done in the diverticulum, especially for flat-shaped papilla. Close co-operation and gentle movement are required when the operator and assistant make the incision. The length of incision should be carefully decided. Bleeding is another common complication after EST, with <50 mL as mild, <200 mL as moderate and >300 mL as massive. One hundred and eighty-six cases (18.1%) had mild bleeding in our study. Since bleeding within 8 h after operation was correlated to food intake, it is essential for 24-h fasting after the surgery.

Preventive countermeasures

Severe jaundice and coagulation disorders should be corrected before carrying out EST. Thrombin can be insufflated or adrenaline can be locally injected for mild active bleeding from the incision. For the patients having bleeding after postoperative 24-h fasting, it is suggested that hemostatic drugs, intravenous infusion, decompression for the stomach and intestine be applied, and gastric lavage with adrenaline-

supplemented cool saline be performed.

REFERENCES

- 1 **Enochsson L**, Lindberg B, Swahn F, Arnelo U. Intraoperative endoscopic retrograde cholangiopancreatography (ERCP) to remove common bile duct stones during routine laparoscopic cholecystectomy does not prolong hospitalization: a 2-year experience. *Surg Endosc* 2004; **18**: 367-371
- 2 **Gao RG**, Fang DG, Liu YM, Yang HL. Treatment of common bile duct stones with endoscopy. *Zhongguo Neijing Zazhi* 1997; **3**: 32-35
- 3 **Zhang BY**, Tian FZ, Wang Y, Huang DR, Gong L. Endoscopic sphincterotomy with needle-shaped knife: report of 476 cases. *Hepatobiliary Pancreat Dis Int* 2002; **1**: 434-437
- 4 **Zhou Y**, Li ZH, Chen M. Endoscopic papillosphincterotomy for the treatment of pancreaticobiliary disease. *Zhonghua Waike Zazhi* 1997; **35**: 274-276
- 5 **Sugawa C**, Park DH, Lucas CE, Higuchi D, Ukawa K. Endoscopic sphincterotomy for stenosis of the sphincter of Oddi. *Surg Endosc* 2001; **15**: 1004-1007
- 6 **Howard TJ**, Tan T, Lehman GA, Sherman S, Madura JA, Fogel E, Swack ML, Kopecky KK. Classification and management of perforations complicating endoscopic sphincterotomy. *Surgery* 1999; **126**: 658-663; discussion 664-665
- 7 **Mavrogiannis C**, Liatsos C, Papanikolaou IS, Psilopoulos DL, Goulas SS, Romanos A, Karvountzis G. Safety of extension of a previous endoscopic sphincterotomy: a prospective study. *Am J Gastroenterol* 2003; **98**: 72-76
- 8 **Barthet M**, Lesavre N, Desjeux A, Gasmi M, Berthezene P, Berdah S, Viviani X, Grimaud JC. Complications of endoscopic sphincterotomy: results from a single tertiary referral center. *Endoscopy* 2002; **34**: 991-997