Introduction

Endoscopic retrograde cholangio-pancreatography (ERCP) allows to treat and solve pancreatico-biliary problems in the 90-97% of cases (1-4). Failures mainly depend on the anatomical anomalies, proximally or nearly the Vater's papilla, such as biliary or pancreatic duct cannulation is impossible. Two types of anatomical anomalies exist: local (papillary or peripapillary) and proximal (oesophageal-gastric-duodenal tract) (5).

The aim of this work is to show the rare causes of ERCP failure due to anatomical anomalies in our experience and what we did to solve these cases.

Patients and methods

From January 2000 to May 2006, 757 inpatient ERCP were performed (M:F=1:1.6, with an average age of 56.9 yrs): 492
(64.9%) for benign disease and 265 (35.1%) for malignant disease. All the patients signed the informed consent to ERCP. We always utilized duodenoscope (TFJ 145R, Olympus Optical Co., Ltd., Tokyo, Japan) or gastroscope in Billroth II patients (GIF 145, Olympus Optical Co., Ltd., Tokyo, Japan). All the patients were in conscious sedation (meperidine chloride 1 mg/kg iv and midazolam 0.5-1 mg/kg iv) under cardio-pulmonary monitoring (mean dose in 20 ml of NaCl 0.9% solution: 10 ml and 8 ml of midazolam and meperidine, respectively).

Results

The success rate of endoscopic sphincterotomy (ES) was of 97.8% (740/757): 698/740 (94.32%) at first attempt, 42/740 (5.68%) at the second attempt. There were only 17/757 (2.2%) failures in our series.

Two deaths (0.26%), no directly correlated to the technique, were observed in patients over 80 years with severe cardiopulmonary and metabolic impairment. We report two cases (0.26%) of severe post-ES bleeding that needed a surgical management, 1 case (0.1%) of acute hemobilia, 1 case of iatrogenic Mallory-Weiss syndrome after the extraction of a biliary stent treated endoscopically (hemoclips and sclerotherapy), 39 cases (5.15%) of bleeding after ES, treated endoscopically, 3 (0.3%) duodenal perforations surgically treated (with raphia), 13 (1.72%) cases of acute pancreatitis, 4 cases (0.4%) of acute cholangitis in oncological patients due to stent migration treated with stent substitution. Furthermore, we report 442 (58.38%) cases of asymptomatic transitory hyperamylasemia.

In 12/17 (70.58%) of ERCP failures, we successfully used the method of rendez-vous. Failure of ERCP was due to an iuxtapatellar diverticula preventing the visualization of the Vater’s ampulla (Fig. 1a) in 8 patients (66.66%), an exophytic locally advanced papillary cancer preventing biliary cannulation in 3 patients (25%) and impossibility of the guide-wire to cross the biliary stricture in 1 patients (8.3%).

In 3/17 (17.64%) of ERCP failures we performed surgery. In two (66.66%) of these patients a severe malignant duodenal stricture prevented the passage of the endoscope and we performed a bilo-enteric (BEA) and gastro-enteric anastomosis (GEA). In the third patient (33.33%), with a multiple iuxtapatellar diverticula in whom the rendez-vous failed too, we performed a choledochotomy, biliary tree toilett and insertion of a T-tube.

In 1/17 (5.88%) case we utilized an interventional radiological approach. The patient, “no fit for surgery”, presented a diffuse pancreatic cancer with stricture of the distal bile duct that made impossible the passage of the guide-wire; the rendez-vous technique failed too. We then employed a percutaneous transcatheter biliary drainage (PTBD).

In 1/17 (5.88%) patient with a voluminous paraesophageal hernia we used a double endoscopic approach. At first attempt ERCP was unsuccessful because of extensive looping of the endoscope within the paraesophageal hernia (Fig. 1b). At the further attempt at ERCP, by an empiric approach we employed a gastroscope to reduce the hernia and restore the normal anatomical axis; immediately after we removed the gastroscope and with the duodenoscope we carried out the ERCP successfully.

In 17/17 (100%) of ERCP failures, the alternative methods used for management of bilio-pancreatic disease were successful.

Discussion

ERCP has developed a prominent and often pivotal role in the management of bile duct stones, benign and malignant biliary obstruction, pancreatic neoplasia, acute pancreatitis from gallstones on from other causes, chronic pancreatitis, bile duct injuries, pancreatic duct disruption, pancreatic pseudocysts, diseases of the major and minor papilla, sphincter of Oddi dysfunction, some hepatic diseases that impact the biliary tree, biliary and pancreatic bleeding, and various types of infection suspected to be of hepatic, biliary, or pancreatic origin. The success of ERCP is sometimes limited by anatomic variations that make cannulation of the target duct and therapeutic maneuvers difficult or impossible. ERCP failure is due to missed reaching and visualization of the papilla and the cannulation of the biliary tree. In these cases it is necessary to employ alternative procedures to solve the bilio-pancreatic disease. The choice of the treatment depends on the anatomic factors that cause the failure. We used to classified these factors in local (papillary and peripapillary) and proximal (esophagogastroduodenal). The former includes papillary tumors (Fig. 1c), papillary stenosis, diverticula and stones lodged at the papilla. The latter includes esophageal, pyloric and duodenal stricture (benign or malignant), esophageal diverticula, the large “J-shaped” stomach and large sliding or paraesophageal hernias.

In our series the local anatomic anomalies that prevented the success of ERCP were peripapillary diverticula, papillary cancer and strictures of the distal bile duct. In all the cases the first choice was the rendez-vous technique. It combines the endoscopic technique with percutaneous cholangiography. It is used when endoscopic cannulation of the papilla is unsuccessful and surgery is indicated, but the risk associated with operation is high. Interventional radiology has provided im-
portant advances in management of biliary tract diseases. Therapeutic techniques performed by percutaneous approach under ultrasonographic guidance permit to cross a guide-wire into the duodenum through the papilla. Success rate are high (99%) with biliary tract dilatation but lower (74%) in the absence of dilatation (1,8). In all but two cases of our serie it allows to solve the bilio-pancreatic disease. In a case of multiple iuxtapapillary diverticula we tried the rendez-vous technique but the guide-wire didn’t proceed and so we preferred to operate the patient because the risk of complication (i.e., ES-bleeding and duodenal perforation). In the second case a severe tumoral stricture of the distal biliary duct prevented to cross the stricture with the guide-wire such as distal to proximal as proximal to distal during rendezvous technique, and we employed a PTBD because of the patient was no fit for surgery (7).

In our series the proximal anatomic variations that cause ERCP fail were duodenal strictures and paraesophageal hernia.

The former were surgically treated and, BEA and GEA were performed. The strictures represent a cause of ERCP failure. Strictures dilatation or stenting are the first attempt but if it fails surgical or radiological management are necessary. If the duodenal strictures is benign, we try with a pneumatic dilatation while in case of neoplastic one we prefer to operate the patient fit for surgery (GEA plus BEA) tacking any other opportunity for the patient. Furthermore, PTBD is the last choice. In the latter case we employed an empiric approach: a voluminous paraesophageal hernia prevented to reach the duodenum crossing the pylorus with a lateral-view duodenoscope, so we introduced a frontal-view gastroscope that allows to restore the normal intestinal axis; removed the gastroscope was taken out and we introduced the duodenoscope and successfully carried out the ERCP (5).

**Conclusion**

In our opinion ERCP failure should not be considered an insuspicous event in the management of bilio-pancreatic diseases (BPD) but only the first attempt. Several approaches exist to solve the BPD. It is necessary the existence of referral centers for the treatment of these disease where multidisciplinaru team work together (endoscopist, radiologist, surgeon and others).

In our experience we failed 17 ERCP for anatomic variations; in all but one we ask the cooperation of others specialists as radiologist and surgeon. In a case we employed our experience and an empirical approach to reduce a voluminous paraesophageal hernia.

ERCP is an operator-dependent procedure. The success of ERCP is sometimes limited by anatomic variations that make biliary cannulation impossible. In these cases it is necessary to employ alternative procedures to solve the bilio-pancreatic disease.

**References**