Introduction

ERCP is used for the diagnosis and treatment of pancreatobiliary disease. Usually, experienced endoscopists have high cannulation rates in an intact stomach, equal to or above 95%. However, patients with altered GI anatomy present a challenge to the therapeutic endoscopist. Therefore, the success rate of ERCP in patients with a prior Billroth II (B-II) gastrectomy vary from 52% to 92%. The degree of difficulty of ERCP has been suggested as an objective way of assessing outcomes, on the basis of procedural difficulty. Thus, the B-II diagnostic ERCP has been suggested as difficulty grade 2, and B-II therapeutic as difficulty grade 3. Two problems are inherent in B-II ERCP. First, the afferent loop intubation can be difficult because of the sharp angulations of the anastomosis or a long afferent loop, especially in a Braun anastomosis, or sometimes because of loop formation at the Treiz ligament. The second problem is that the cannulation has to be done in an opposite direction. To overcome the problems, various techniques have been introduced for the successful ERCP in patients with a B-II gastrectomy, including using a cap-fitted forward-viewing endoscope, a single-balloon or a double-balloon enteroscope, an anterior oblique-viewing endoscope, and a multibending endoscope. However, their effect of experience on outcome and skillfulness has not been evaluated so far. In that sense, deep biliary cannulation can be used as a marker of skillfulness at ERCP in patients with a B-II gastrectomy. Therefore, primary aim of this article was to analyze the feasibility of Cap-assisted ERCP in altered anatomy.

Method

1. Endoscopic Procedures

For cap-assisted ERCP, a transparent cap (distal attachment; Olympus, Tokyo, Japan) was attached to the tip of the endoscope. Patients were sedated with midazolam (2.5-10 mg) or diazepam (5-10 mg), supplemented, if necessary, with pethidine (12.5-25 mg). All patients received oxygen administered by nasal prong and were monitored by pulse oximetry and electrocardiography. Cap-assisted ERCP using a cap-fitted forward-viewing endoscope was already described. Selective biliary cannulation was achieved by either the push or the suction techniques, using a straight catheter (PR-10Q; Olympus, Tokyo, Japan) through the cap. At first, selective biliary cannulation was performed by the push technique; the duodenal base of the papilla was pushed with the 11-
o’clock margin of the cap, and the tip of the catheter was slowly pushed into the CBD at the 5-o’clock position. When the push technique failed, the suction technique was tried; the tip of the catheter was located to the orifice, papilla was sucked through the cap, and then the tip of the catheter was passively advanced into the CBD. When both the push and the suction techniques failed, precut or fistulotomy was tried. After selective biliary cannulation, therapeutic procedures, such as EST, EPBD, stone extraction and biliary drainage, were performed. EST was performed with a Soehendra Billroth II sphincterotome. The proper position of the sphincterotome was also achieved by either the push or the suction techniques. EPBD was performed in cases with large stones and inadequate EST. The papilla was dilated up to 12-20 mm.

2. Population and Results

From March 2006 to February 2011, the results of 82 consecutive patients with a Billroth II gastrectomy (n=72), Roux-en-Y total gastrectomy (n=4), abnormally located papilla of Vater in the duodenal bulb (n=3), hepaticoduodenostomy (n=2), or Braun anastomosis (n=1), who underwent ERCP, were analyzed for outcome of their ERCP. Eighty-two patients underwent a total of 137 ERCP procedures with a mean of 1.75 sessions per patient. Among 137 sessions in patients with anatomical variations, the papilla of Vater was successfully reached in 132 sessions (96.4%) with the cap-assisted forwarding endoscope. The successful intubation rates for the B-II gastrectomy and Roux-en-Y gastrectomy were 99.2% (125/126) and 57.1% (4/7). Among the 132 sessions in which access to the papilla was achieved, selective cannulation of the bile duct was successful in 129 sessions (97.8%). Therapeutic interventions including stone extraction (n=57), sphincterotomy (n=54), stent placement (n=41), nasobiliary drainage (n=20), endoscopic papillary balloon dilatation (n=7), and mechanical lithotripsy (n=15) were performed successfully. The clinically important procedure related complication rate was 9.3% (12/129). Procedure-related pancreatitis developed in 2.3% (3/129) of cases. Immediate bleeding developed in 6.2% (8/129) of cases during the procedure. Bleeding was controlled by only a local injection of epinephrine in all cases. One patient from the third quartile had a perforation at the EST site. She recovered uneventfully but underwent open cholecystectomy for acute calculous cholecystitis. There was no death related to the procedure.

Discussion

Diagnostic and therapeutic ERCP in patients after gastric resection with reconstruction poses a challenge to the biliary endoscopists because of the altered anatomy. As in patients with normal anatomy side-viewing endoscopes have been used in most studies on endoscopic transpapillary treatment in patients with prior B-II gastrectomy. The reported success rate of reaching the papilla of Vater has been 63%~87%. However, the results of this study showed a high success rate with the cap assisted ERCP technique in patients with altered GI anatomy in a relatively large case series. The results of the present case series suggest that the cap assisted ERCP technique could improve the success rate in the approach to the papilla of Vater. The cap assisted ERCP technique has certain benefits in approaching the papilla of Vater. First, the cap is useful for overcoming the sharp angulations that can be encountered when entering the afferent loop. Second, the cap is also useful for traversing the afferent loop because it can facilitate reducing the loops created during the procedure. The risk of perforation can be reduced by avoiding excessive looping and not attempting any blind rotational maneuvers. Also,
the boundary of transparent cap can provide a careful excision during EST.10 The forward-viewing endoscope is therefore preferred for ERCP in patients with a B-II gastrectomy, for easy and safe procedures; nevertheless, selective biliary cannulation can be problematic in some cases.19 The cap-assisted ERCP can improve the success rate of selective biliary cannulation. Successful deep biliary cannulation can be facilitated by either the push or the suction techniques, using a straight catheter (PR-10Q; Olympus, Tokyo, Japan) through the cap. Because of the reversed papilla in patients with a B-II gastrectomy, the most important step in the push technique is keeping the tip of the straight catheter in a position that will allow access to the CBD at the 5 o’clock position. The cap-assisted ERCP can enable to maintain that position.10 When the push technique failed, the suction technique was very useful. In the suction technique, the tip of the catheter was passively advanced into the CBD, while the papilla was being sucked through the cap.

After deep CBD cannulation and EST, further therapeutic procedures, including EPBD, stone removal with Dormia baskets and/or balloon tipped catheters, and mechanical lithotripsy, can be performed without difficulty. However, in the present study, the success rate for reaching the papilla of Vater and selective cannulation of the bile duct in patients with a Roux-en-Y gastrectomy or Braun anastomosis was relatively low compared to those with a B-II gastrectomy. Patients with a Roux-en-Y gastrectomy or Braun anastomosis had several obstacles to the success of the ERCP. First, they had longer afferent loops than patients with B-II reconstruction. Another obstacle was the presence of severe postoperative adhesions, which restricted manipulation of the endoscope, hindered the introduction of the endoscope to the papilla of Vater, and posed a risk of perforation. Once the papilla of Vater was reached, cannulation into the papilla was not substantially different from the method used in patients with a B-II gastrectomy. Several another recent studies showed that the ERCP with a short double-balloon enteroscope or single-balloon enteroscope might be promising for diagnostic and therapeutic ERCP in patients with a Roux-en-Y gastrectomy. Finally, the results of this study showed that the cap-assisted forward-viewing endoscope was a safe, time-saving, and cost-effective modality. First, the overall clinically important procedure-related complication rate was 9.3% (12/129) comparable to the previously reported complication rate of 4~11.2% with the conventional ERCP.19-22 Second, the cap-assisted ERCP is a time-saving procedure in patients with a B-II gastrectomy. The mean time required for reaching papilla with this technique was only 4.1 (4.4) minutes. However, the mean time required were 13.0 (12.0) minutes with the anterior oblique-viewing endoscope and 22.5 (24.7) minutes with the single-balloon enteroscope.12,14 Also, the cap assisted ERCP does not require any special endoscope. So, this ERCP method can be used as primary approach in patients with altered gastrointestinal anatomy.

Conclusions

ERCP with the cap-fitted forward-viewing endoscope was safe and effective in patients with a prior B-II gastrectomy although the lack of feasibility in Roux-en-Y or Braun anastomosis. The cap-assisted ERCP method can be considered as one of the primary approaches in patients with a prior B-II gastrectomy.

References


