

Laparoscopic Assisted Trans Gastric Endoscopic Retrograde Cholangiopancreatography (ERCP) - A District Hospital Experience

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Abstract: *Background:* Traditional ERCP approach for choledocholithiasis becomes very challenging in patients with previous Roux-en-Y gastric bypass (RYGB) and cholecystectomy [1, 2]. Various techniques like Double Balloon Enteroscopy and Spiral Enteroscopy were developed to manage these patients. The use of pediatric colonoscope and enteroscope in long limb bypass patients was also reported. Laparoscopic assisted ERCP (LA-ERCP) is a simple procedure that does not require special equipment. We describe using this method in a district hospital. *Presentation of Cases:* Three cases had LA-ERCP for CBD stones. They all had previous laparoscopic cholecystectomy and RYGB. In 2 cases two stay sutures was used to bring the stomach to the abdominal wall. Then 15 mm port was inserted into a gastrotomy and ERCP performed. Both patients were discharged within 2 days. Third patient had high BMI of 48. Adhesions prevented bringing the stomach to the abdominal wall. Endoscope was inserted via 15mm port into abdominal cavity and guided to the gastrotomy site. Patient stayed in hospital for 2 weeks due to COVID. *Conclusion:* LA trans-gastric ERCP is a feasible procedure. it is safe and reliable, with low complication and good recovery and can be performed in district hospital avoiding transfer to tertiary centers.

Keywords: Transgastric ERCP, Bariatric ERCP, Trans-cystic ERCP, altered anatomy ERCP

1. Introduction

Post bariatric patients are at a considerable risk of developing biliary stone disease with 29-36% developing gallstones and 13% developing biliary sludge [1, 2]. For the treatment of biliary disease, traditional ERCP approach becomes very challenging due to altered anatomy of alimentary canal especially in cases with Roux-n-Y gastric bypass [3, 4]. There is a considerable increase in the number of RYGB procedures performed for obesity treatment, [5, 6] and conventional ERCP techniques have been reported with success rate of as low as 33% in RYGB patients and 67% with Billroth II anastomosis [7]. Gotstout first reported the use of pediatric colonoscope to reach papilla, in 1988, in 3 patients with RYGB anatomy [8]. Elton et al. reported the use of pediatric colonoscope and enteroscope in long limb bypass patients with overall success rate of 84% [9] Wright et al. has reported an ERCP success rate of 67% with combined use of forward-viewing colonoscope and duodenoscope in long limb RYGB patients [10].

To achieve a higher technical and clinical success rate in these patients with altered upper GI tract anatomy, various endoscopic and surgical techniques have been developed in the last two decades. Device assisted enteroscopy techniques like Double Balloon Enteroscopy, Single Balloon Enteroscopy and Spiral Enteroscopy have been

utilized to perform ERCP in RYGB anatomy and has been reported with technical success rates of 74%, 69% and 72% respectively [11].

Alternative access ERCP techniques have also been developed to achieve higher success rates. These techniques include laparoscopic assisted ERCP (LA-ERCP), Percutaneous Assisted Trans prosthetic Endoscopic Therapy (PATENT), and EDGE procedure which utilizes the standard ERCP accessories. The first reported development of technique was reported by Baron and Vickers in 1998 when they utilized surgical gastrotomy along the greater curvature of remnant stomach to introduce the endoscope [12]. Among these procedures, Laparoscopic assisted – ERCP, originally described in 2002 [13], has been reported with technical success rate of ductal cannulation in 98.5% of RYGB patients [14]. This technique involves laparoscopic placement of trocar into the excluded stomach which allows the endoscopist to undertake ERCP using standard devices percutaneously [15].

Laparoscopic CBD exploration is another technique for management of choledocholithiasis. In an un-altered anatomy, intra operative ERCP has been reported with higher clearance rate, shorter length of hospital stays and operative time, and lower morbidity than LCBDE [16].

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Although there are no reported RCTs comparing LCBDE with LA-ERCP, there is a belief among surgeons that LA-ERCP may be better for the above-mentioned reasons [17].

LA-ERCP is among the most commonly performed antegrade ERCP procedures with higher efficacy, effectiveness and success rate [18]. LA-ERCP is also considered in patients who require simultaneous cholecystectomy. The additional benefit of use of laparoscopy in LA-ERCP is to treat adhesions and internal hernias as well [19].

2. Patient's Presentation

First patient is 60 years old female BMI of 23, and past medical history of collagenous colitis. She had laparoscopic cholecystectomy and OTC with Bile duct clearance in 2010 and had Roux-en-Y Gastric Bypass (RYGB) in 2015. She developed a De Novo stone and MRCP showed 10 mm dilated CBD with distal stone adjacent to the ampulla. In January 2016 She underwent laparoscopy assisted trans gastric remnant ERCP. A single 13 mm stone confirmed and extracted. She had an uneventful recovery and was discharged 2 days post ERCP with no long term complications.

The second patient is 50 years old female with BMI 25 and no significant Past medical history. She had RYGB in 2010. She had laparoscopic cholecystectomy and OTC in June 2020. A month later she presented with obstructive Jaundice and MRCP confirmed retained 6 mm stone. She had trans gastric bypass She had uneventful recovery and was discharged on day 1 post op. she had an infection of main ERCP port which was managed conservatively with Antibiotics.

In previous 2 cases We used veress needle to establish pneumoperitoneum at Palmer's point, two 5 mm ports and 15 mm port were used with 5 mm camera. Initial purse string suture was placed then gastrostomy performed with harmonics between two stay sutures that are used to bring the stomach to the abdominal wall. The 15 mm port is inserted into the gastrostomy opening and ERCP performed. After ERCP, Gastrostomy closed using the purse string suture.

Third patient 52 years old female with BMI of 48 and multiple co-morbidity including AF on Edoxiban, and spinal stenosis. She had laparoscopic cholecystectomy in 2002 and RYGB in 2009 but regained most of weight in the last few years. She presented with obstructive jaundice and abdominal pain. She had CT that showed gross intra and extrahepatic hepatic ductal dilatation, the CBD was dilated to the level of the ampulla, measuring 20mm with no radiopaque calculi seen. She could not have MRCP because of claustrophobia.

She had trans-gastric ERCP. Intraoperatively, due to patient high BMI and adhesions it was not possible to bring the stomach to the abdominal wall side view gastroscope was inserted via 15 mm port into abdominal cavity and guided to the gastrostomy site and ERCP

performed. Then gastrostomy was closed through a mini laparotomy. Patient stayed in hospital for 2 weeks due to COVID and hospital acquired pneumonia.

3. Discussion

Trans-gastric laparoscopy-assisted ERCP represents an effective approach for the Common bile duct stones after RYGB in patients who had previous laparoscopic cholecystectomy.

Some considerations must be taken into account when considering this procedure. The logistics of arranging the case done on an emergency theatre and coordinating between different teams, including endoscopy team, theatre staff, radiology team, anaesthetics team and ideally 2 surgeons one of them being ERCP competent.

We found that performing the gastrostomy at the highest possible point on the greater curvature of the gastric remnant provides the endoscopist with more natural scope angle. Purse string suture around planned gastrostomy can also be used for easier closer at the end of the procedure. When removing the endoscope, it should be removed with the end in neutral positing to avoid injury to the plastic lining of the scope.

Few methods have been described for accessing the biliary tree in patients with altered RYGB anatomy. In patients that did not have previous cholecystectomy trans cystic or transductalcholedochoscopy and CBD clearance can be done before performing laparoscopic cholecystectomy. In post cholecystectomy patient's double-balloon ERCP or endoscopic ultrasound-directed transgastric ERCP can be performed. We elected to perform the laparoscopy-assisted approach because it does not require any special equipment.

Special care has to be made in obese patient with multiple adhesions to the stomach; however the procedure can still be performed safely in this group of patients.

4. Conclusion

Transgastric laparoscopy assisted ERCP through 15 mm port is a feasible procedure that can provide an effective biliary access after RYGB and cholecystectomy. it is safe and reliable approach, with low complication and good recovery.

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