CASE REPORT

A laparoscopic transgastric approach to the treatment of sphincter of Oddi dysfunction postgastric bypass

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SUMMARY

Obesity is endemic and bariatric surgery is increasing in an attempt to reduce the physiological and social cost. As the prevalence of bariatric surgery increases, in particular laparoscopic roux-en-Y gastric bypass (LRYGB), the need to investigate and treat subsequent pathology in the gastric remnant and biliary tree will accrue. We describe a novel combined surgical and endoscopic technique addressing the challenges of postoperative anatomy, allowing investigation and treatment of the gastric remnant and biliary tract. We present the case of a patient with sphincter of Oddi dysfunction post-LRYGB who underwent laparoscopic transgastric endoscopic injection of Botox into the ampulla with an excellent symptomatic relief. Subsequent laparoscopic transgastric sphincterotomy allowed definitive treatment and allowed symptom resolution at 6 months follow-up. Laparoscopic transgastric endoscopic investigation and treatment is a novel approach to circumvent the restrictions of post-LRYGB anatomy and may assume greater importance in an ageing obese population.

BACKGROUND

Obesity is increasing in the UK and, in 2008, a quarter of people in the UK were obese (24% men and 25% women over the age of 16 had a body mass index (BMI) >30 kg/m²).¹ In concordance with this, bariatric surgery is increasing in an attempt to combat the physical and economic costs associated with obesity. In 2000/01, 261 bariatric surgical procedures were performed in the UK in comparison to 8087 recorded in 2010/11.¹ Gastric bypass is arguably the most effective bariatric procedure in terms of weight loss, and has increased in prevalence over the last decade. In 2000, gastric bypass accounted for 27% of all bariatric surgical procedures in England, while in 2008 this accounted for 47.7%.² Postbariatric surgical patients are at risk of the development of other pathologies for example gallstones, ductal stones, sphincter of Oddi dysfunction (SOD) and dysplasia or carcinoma in the gastric remnant. Disruption of the normal anatomy in these patients complicates the investigation of these problems. With the increased number of patients within the UK having undergone gastric bypass for morbid obesity, these challenges need to be addressed.

In order to access the stomach remnant or biliary tree a number of methods have been described, both endoscopically and laparoscopically. Conventional endoscopic retrograde cholangiopancreatography

(ERCP) has been attempted in patients after roux en Y bypass with 66% success rate.³ Double balloon enteroscopy (DBE) has been used in order to allow examination of the biliary tract after roux-en-Y gastric bypass.^{4 5} DBE uses a forward viewing scope and therefore successful biliary tract cannulation is less successful than with a side viewing duodenoscope, 60% vs 80–85% for ERCP for those with normal anatomy.^{5–7} To attempt to increase success, ERCP has been performed using open or laparoscopic transgastric access. A small number of patients have undergone these procedures, with access either through an established gastroenterostomy, laparoscopically through the gastric antrum or body, and laparoscopically through the biliary pancreatic limb of the reconstruction.^{8–18} This is the first case to describe laparoscopic transgastric endoscopy with injection of Botox and subsequent sphincterotomy for SOD following laparoscopic roux-en-Y gastric bypass (LRYGB) for morbid obesity.

CASE PRESENTATION

A 40-year-old woman with morbid obesity and a BMI of 50 kg/m² underwent LRYGB in July 2010. She had a previous history of open cholecystectomy in 1998, for cholecystitis. Postgastric bypass she developed upper abdominal pain in association with deranged liver function tests. She underwent abdominal ultrasonography which revealed a dilated common bile duct at 12 mm and intrahepatic duct dilatation. No choledocholithiasis was demonstrated. Subsequent magnetic resonance cholangiopancreatogram revealed minor intrahepatic and extrahepatic duct dilatation only. She went on to have a nuclear medicine hepatobiliary function scan, stimulated with cholecystikinin. The hepatic hilum to duodenal transit time was prolonged at 54 min with features in keeping with obstruction to drainage of a postcholecystectomy bile duct which is in keeping with SOD. In view of the previous LRYGB, in order to access the ampulla to treat this patient, the decision was made to perform a laparoscopic transgastric endoscopy and injection of Botox into the sphincter of Oddi.

The patient was placed supine and preincision gentamicin and metronidazole administered intravenously. Open insertion of a supraumbilical 12 mm port allowed 12 mm Hg capnoperitoneum to be established. Two further 5 mm ports were placed under the direct vision in the left and right upper quadrants. Laparoscopy was performed, and the Harmonic scalpel was used to allow sufficient

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Figure 1 Laparoscopic transgastric endoscopic injection of Botox into the sphincter of Oddi/sphincterotomy—laparoscopic views. (A) Capnoperitoneum was established at 12 mmHg and a 2/0 prolene suture placed through the abdominal wall and the greater curvature of the gastric remnant and tied to allow adequate traction. An 0 ethibond purse string was placed intracorporeally in the greater curvature of the gastric remnant and a gastrostomy made in the centre of this using the harmonic scalpel. A 12 mm trocar placed in the left upper quadrant, passing through the gastrostomy and purse string allowed access for the endoscope. (B) After removal of the trocar and endoscope upon completion of Botox injection, the purse string was tightened and subsequently intracorporeally oversewn using 3/0 PDS. Omentum was tacked over the repair.

mobilisation of the gastric remnant to the anterior abdominal wall. A 2/0 prolene suture was passed through the anterior abdominal wall and greater curve of the gastric remnant, and

tied extracorporeally to allow adequate traction. A purse-string ethibond 0 suture was placed intracorporeally on the greater curve of the gastric remnant and a gastrostomy made in the centre of this using the harmonic scalpel. A 15 mm port was placed in the left upper quadrant and into the gastric remnant via the gastrostomy. The purse string was tightened to secure the port (figure 1). A forward viewing endoscope with an 11 mm diameter was placed into the port and then into the gastric remnant. The stomach was insufflated with carbon dioxide to avoid excessive distension. The endoscope was passed into the duodenum and the ampulla of Vater identified (figure 2). One hundred units of Botox was injected, 25 units in each quadrant, around the ampulla. Retroflexion of the endoscope facilitated this manoeuvre. Haemostasis was checked and the scope withdrawn from the patient. The 15 mm port was removed from the gastric remnant and the purse string further tightened to close the enterotomy. This was oversewn with 3/0 PDS and an omental patch tacked to this (figure 1). The capnoperitoneum was released and the supraumbilical port was closed with PDS and skin glue was applied to all incisions.

Postoperatively the patient was allowed to eat and drink, and discharged home the following day. At 6 weeks follow-up in the clinic she had complete resolution of her symptoms. After counselling the decision was made to proceed with laparoscopic transgastric ERCP and sphincterotomy. Operative technique was as previously described, although a side viewing scope was used to facilitate sphincterotomy (figure 3). Postoperative course was uneventful and the patient remains symptom-free at 6 months follow-up.

DISCUSSION

As the postbariatric surgery population grows, the challenge of managing de novo intra-abdominal pathology in these patients with altered anatomy will become more commonplace. In particular, SOD is challenging due to access to the duodenum after roux-en-Y reconstruction. Transduodenal sphincteroplasty has been described for patients following LRYGB for morbid

Figure 2 Laparoscopic transgastric endoscopic injection of Botox to sphincter of Oddi—endoscopic views. (A) Endoscopic visualisation of the ampulla of Vater. (B) Injection of Botox into the ampulla. (C) Retroversion of the scope to allow better access for quadrant injection of Botox. (D) Postinjection appearances of the ampulla.

Figure 3 Laparoscopic transgastric endoscopic retrograde cholangiopancreatography and sphincterotomy—endoscopic views. (A) Endoscopic view of ampulla. (B) Cannulation. (C) Sphincterotomy. (D) Postsphincterotomy appearances of ampulla.

obesity.¹⁹ This procedure involves an abdominal incision and the median hospital stay of 5 days (range 2–9 days) reflects a longer postoperative recovery, when compared to laparoscopic procedures. Arguably, a combined laparoscopic and endoscopic procedure to access the biliary tree, enabling treatment for SOD, results in reduced postoperative morbidity and shorter hospital stay.

A combined laparoscopic and endoscopic approach to the management of SOD dysfunction in patients following LRYGB has been reported for five patients.^{19 20} A transgastric approach to endoscopic placement was described to allow sphincterotomy. We have described transgastric laparoscopic placement of a forward viewing endoscope to allow Botox injection for SOD dysfunction. This procedure is both diagnostic and therapeutic in that it allows a period of observation postoperatively to determine the effect on symptomatology. The risk of perforation of viscus is reduced in comparison to sphincterotomy. The concept of a laparoscopic transgastric diagnostic endoscopic procedure is interesting. With the increasing number of patients undergoing bariatric surgery there will be increasing numbers of older patients post-LRYGB. While little is known about the long-term physiological and histological changes in the remnant bowel, these patients are still potentially at least at 'background' risk of dysplasia and adenocarcinoma within the gastric remnant. Techniques such as DBE have been described, although this technique is not available in many centres and carries the risk of perforation.²⁰ Alternatively virtual CT gastroduodenoscopy has been used to visualise the bypassed stomach and duodenum, but is expensive and cannot provide histological diagnosis or allow therapeutic procedures.²¹ Transgastrostomy gastroduodenoscopy has been described but requires a gastrostomy tube in situ.¹⁵ Our technique describes a method by which the gastric remnant and duodenum can be adequately visualised without stoma formation. As more patients undergo bariatric surgery, novel approaches to their investigation, diagnosis and management can circumvent the challenges of postoperative anatomy.

Learning points

- Obesity is endemic in the UK population and bariatric surgery, in particular laparoscopic roux-en-Y gastric bypass (LRYGB), is increasing.
- As the post-LRYGB population ages, demand to investigate the gastric remnant and biliary tree will increase and the postoperative anatomy provides challenges.
- A combined laparoscopic and endoscopic procedure allows efficient diagnostic and therapeutic access to the gastric remnant, duodenum and biliary tree.

Contributors JCH had the idea for the paper. KD and JCH wrote the paper. JCM and CGB critiqued the paper. JCH, KD and CGB performed the surgery/endoscopy.

Competing interests None.

Patient consent Obtained.

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