Laparoscopic reoperative approach after open bariatric surgery

Introduction
Morbid obesity is a major health problem in most developed countries, and bariatric surgery has a well tried and tested record in resolving or markedly improving most associated co-morbidities. An increasing number of patients require long-term revision of a failed bariatric operation either for unsatisfactory weight loss or for complications. Van Gemert et al reported a 56% incidence of revision after primary vertical banded gastoplasty (VBG) compared with a 12% incidence of revision after gastric by-pass1. In other series, revisional procedures have been performed in 10% to 25% of patients who had initially undergone VBG or in 5% to 13% of patients who had either a VBG or GBP2. Jones in his review reported a 1.4% revision requirement3. A revisional procedure...
is associated with a higher rate of postoperative complications and is usually performed with a traditionally open approach. The aim of this study was to determine the safety and efficacy of a laparoscopic approach to reoperative operations after open bariatric surgery.

Materials and methods

We studied prospectively 26 patients who underwent laparoscopic reoperative bariatric surgery between January 2003 and July 2007 at the University of Rome Tor Vergata, Department of Surgery. There were 22 women and 4 men. Mean age was 40.5 years (range: 28 to 56 years). Mean initial preoperative BMI was 49.7 kg/m² (range: 43.6 to 55.4 kg/m²). The 26 primary operations were open gastric banding (GB) in 19 cases, open vertical banded gastroplasty (VBG) in 3 cases, jejuno-ileal bypass (J-I BP) in 2 cases, and open gastric bypass (RYGB) in 2 cases. Indications for re-operation were insufficient weight loss in 14 patients, band slippage in 7, band erosion (Fig. 1) in 3 and severe malabsorptive syndrome in 2. After the primary operation, the lowest mean BMI was 41.8 kg/m² (range: 24 to 47 kg/m²), which increased to 45 kg/m² before reoperation (range: 24.2 to 51.8 kg/m²). On average, the reoperation was performed 22 months after the primary procedure (range: 0 to 34 months).

A complete preoperative work-up was undertaken in all patients. Upper endoscopy together with contrast swallow were performed, and medical clearance from internal medicine and psychiatry was obtained. All patients were thoroughly instructed and gave informed consent 24 hours before surgery. None of the patients received bowel preparations prior to surgery. Conversion to laparotomy was needed in 5 cases (5/26, 19.2%). Early complications included 1 case of pneumothorax and 6 cases of wound infection (24.1%). Mortality was zero. The mean follow-up was 36.2 months. Mean postoperative BMI was 34.3 kg/m². Laparoscopic reoperative bariatric surgery is feasible, safe and effective after open bariatric surgery.

Key words: laparoscopic bariatric surgery, reinterventions

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Fig. 1. Band erosion.
Results

We performed open reoperative procedures only as conversion of a laparoscopic reoperative attempt. Eleven GB patients underwent band removal (Fig. 2), 7 GB patients were converted to a RYGB (Figs. 3, 4, and 5), 1 band was removed and simultaneously replaced, the 2 J-I BP patients underwent intestinal restoration, 3 VBG patients were converted to a laparoscopic RYGB (LRYGB), 1 RYGB patient was converted to a laparoscopic long limb gastric bypass and in 1 patient with a gastrogastric fistula after RYGB the fistula was resected. Further procedures included 1 laparoscopic GB (LGB), 1 LRYGB, and 1 laparoscopic bili-pancreatic diversion.

Mean operative time was 168 minutes (range: 90 to 260 min). In patients with simple band removal, mean operative time was 100 minutes (range: 90 to 120 min). In the remaining patients, mean operative time was 180 minutes (range: 120 to 260 min). Seven patients (24.1%) experienced complications. One case of pneumothorax occurred in a patient who, following a gastric banding erosion, was found to have the band adherent to the left diaphragm. During dissection, a pleural injury occurred which was treated by chest tube insertion. The other 6 patients had wound infections successfully treated with drainage and antibiotic therapy. Three patients later required a third operation for insufficient weight loss. One patient with a previous J-I BP who underwent an intestinal restoration had a LGB, one received a laparoscopic bili-pancreatic diversion after a long limb RYGB, and one had a la-
paroscopic RYGB after gastric band removal. In total, conversion to laparotomy was needed in five cases (5/29, 17.2%), in all cases for severe adhesions. Mean hospital stay was 6.5 days (range; 4 to 14 days). All patients were followed up by regular outpatient clinical appointments. The mean follow-up was 36.2 months (range; 22 to 44). At present, mean BMI is 34.3 kg/m$^2$ (range; from 24.5 to 44.6 kg/m$^2$).

**Discussion**

Revisional bariatric procedures are performed in 2% to 25% of patients previously submitted to a primary operation. There are no specific rules to define the appropriateness of reoperative obesity surgery. It can be indicated either for late complications or for insufficient weight loss.

Complications of procedures such as stenosis with gastric obstruction after VBG or metabolic complications after jejunoileal bypass are obvious indications for reoperative surgery. Long-term complications after RYGB include bowel obstruction, anastomotic stricture, incisional hernia, marginal ulceration, and nutritional deficiencies. Other reasons for reoperation after RYGB can be a proximal gastric pouch and stoma dilatation. Late complications of gastric banding include band slippage, access-port infection, port and tubing problems and band erosion. Staple line disruption accounted for most surgical failures in VBG patients before the use of cutting staplers to divide the stomach. Since then, reasons for reoperation after VBG consist in stoma stenosis, band erosion, incorrect band size, pouch and stoma dilatation. When a serious complication occurs, surgeons should consider the patient suitable for a revisional procedure. Furthermore, when correcting a complication of a bariatric operation, surgeons should not only perform a procedure that corrects the complication but also provide continued assistance to avoid weight regain.

On the other hand, the most common indication for reoperation is insufficient weight loss. All bariatric operations have some incidence of failure. The definition of failure includes insufficient weight loss, inadequate resolution of co-morbidities, and development of side effects negatively influencing lifestyle. Insufficient weight loss following restrictive procedures can also be caused by dietary changes in patients who have learned to eat high-calorie liquid foods. There is clear evidence that conversion of a vertical banded gastropasty can be successfully performed, RYGB usually being the operation of choice.

In a large series of patients reported by Behrens et al, revisional procedures included conversion to VBG in 33%, RYGB in 52% and bilio-pancreatic diversion. They concluded that conversion to RYGB provided more effective weight loss than VBG. Sugerman et al reported a series of 53 patients who underwent VBG and conversion to RYGB with an excess weight loss of 67% but with a complication rate of 50%. Jones reported only a 13% complication rate for a series of 141 patients undergoing reoperative surgery to convert from failed bariatric procedures to RYGB.

The use of gastric banding as a reoperative procedure has also been successfully reported in several centres. O’Brien et al described the use of open gastric banding to revise failed gastroplasty for 50 patients with a 3-year weight loss of 47% of excess weight. A similar experience was reported by Kyzer et al, placing gastric banding in 37 patients who had a failed gastroplasty or RYGB, resulting in a good weight loss with low postoperative complications and reoperations.
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Failed RYGB is usually treated by adding a malabsorptive component to the procedure, as described by Fobi and by Sugerman. Both authors reported a good decrease in BMI in their patients but at the cost of a high incidence of protein malnutrition.

To date, the use of operative laparoscopy in revisional bariatric surgery is infrequent in the literature, with the majority of authors describing a traditional open approach. However, with the passage of time and increased experience, we will continue to see much more interest in the laparoscopic approach in the future.

Gagner et al reported their experience with a laparoscopic conversion of 27 patients with failed open or laparoscopic gastroplasty, gastric banding or RYGB. The complication rate was 22% and a satisfactory decrease in BMI was achieved.

The use of a laparoscopic bilio-pancreatic diversion after failed laparoscopic gastric banding was reported by Fielding and co-workers. A 40% excess weight loss was observed with a 6.3% complication rate.

Using a laparoscopic approach, we observed a complication rate of 24.1% with no mortality and a conversion rate of 17.2%.

Although our follow-up is relatively short, only three patients required a third operation for insufficient weight loss and all of the remaining patients are doing well. Mean post-operative BMI is 34.3 kg/m², i.e. below the range of morbid obesity. We experienced a high conversion rate because of the technical difficulties involved in dealing with adhesions and inflammatory conditions. We believe that the high conversion rate was associated in our experience with the low complication rate because the laparoscopic attempt did not jeopardise the procedure.

As a result of this careful behaviour we observed no postoperative anastomotic leaks. For these reasons, we believe that laparoscopic reoperative surgery must be performed by surgeons well trained in both bariatric and laparoscopic surgery. In our experience, the laparoscopic approach proved to be feasible, safe and effective, but there is nothing wrong with converting to the open technique, if necessary, or in cases where the latter approach will actually decrease the surgical risk.

The conversion of a failed restrictive procedure was performed using an RYGB as the procedure of choice. Although the number of patients is small, we observed a 44% BMI drop on converting LGB patients to RYGB, resulting in an average BMI of 28, down from the original 50.

Bibliografia


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