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Research Articles

Revision of Failed Vertical Banded Gastroplasty to Non-resectional Scopinaro Biliopancreatic Diversion: Early Experience

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Background: The most commonly performed revision operation following failed vertical banded gastroplasty (VBG) is Roux-en-Y gastric bypass, although revision to biliopancreatic diversion (BPD) with duodenal switch is now another common option. We describe the surgical technique for revision of a failed VBG to a non-resectional Scopinaro BPD in a series of patients, as well as the outcome in terms of complications and mean % excess weight loss (%EWL).

Methods: A retrospective review was conducted on all patients who underwent revision to BPD at Mercy Bariatrics, Western Australia, between June 2001 and April 2005. This yielded 20 patients who had revision to BPD, 9 of whom had VBG as their initial operation. The mean %EWL was measured at regular intervals postoperatively (3, 6, 12, and 24 months).

Results: Mean %EWL at 12 and 24 months was 69.5 and 76.7, respectively. These results are comparable to %EWL after a primary BPD. Nutritional manifestations were found to be the most common of the minor complications.

Conclusion: Our technique for revision of a failed restrictive operation to a non-resectional Scopinaro BPD is described. The preliminary results in terms of %EWL and complications are comparable to other revisional malabsorptive operations. Prospective randomized controlled trials are needed to further evaluate effects of revision to a non-resectional Scopinaro BPD and to ensure that the results (in terms of %EWL) are reproducible.

Key words: Morbid obesity, bariatric surgery, gastroplasty, revisional biliopancreatic resection, non-resectional BPD

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Introduction

Revisional bariatric surgery is technically demanding. The majority of these studies focus on patients who have undergone vertical banded gastroplasty (VBG), a number of whom have regained weight after good weight loss initially.[1-4] The most commonly performed revisional operation following failed VBG is Roux-en-Y gastric bypass (RYGBP),[5] although some surgeons have revised the VBG to a biliopancreatic diversion with a duodenal switch (BPD-DS).[6,7] This paper is a retrospective study of all patients referred to a single surgeon (LC) following a failed VBG, who were subsequently revised to a Scopinaro BPD,[8] modified by preservation of the distal stomach.

Materials and Methods

Case Material

A retrospective review was conducted on all patients who underwent revision to BPD at Mercy Bariatrics, Western Australia, from June 2001 to April 2005. Patients were recruited via the Lapbase Database System. The search, using 'Failure of other surgery', yielded 20 patients who had revision to BPD. Nine of these patients had VBG as their initial surgery.

All patients underwent an initial gastroscopy to elucidate the causes of failure before any revisional surgery was contemplated. Multiple appointments with the patient were conducted preoperatively. A multi-disciplinary team approach was utilized, including dietician and physician, to assess and sta-

bilize associated co-morbidities.

The mean % excess weight loss (%EWL) for VBG revised to a Scopinaro BPD was measured at regular intervals postoperatively (i.e. 3, 6, 12, and 24 months).

Demographics

Of the 9 patients, 8 were female and 1 was male. The mean age of these patients prior to the revisional BPD was 54.4 years. The mean body mass index (BMI) before the initial VBG and the revisional BPD was 53.4 and 44.9, respectively.

Surgical Technique: VBG to a Modified Scopinaro BPD

Under general anesthesia, the patient was positioned on his/her back in the Trendelenburg position. The patient was prepped and draped. With the surgeon on the right side of the patient, a midline laparotomy was performed. Then the surgeon positioned him/herself between the patient's legs with the assistant on one side and the scrub nurse on the other side.

If not previously performed, the first step was a routine cholecystectomy, clipping the cystic duct and artery after confirming the anatomy with an intra-operative cholangiogram. Extensive adhesions were usually present from previous surgery, and were divided.

The greater curvature of the stomach was partially mobilized and a gastrotomy was created in the antrum, which allowed palpation of the lesser curvature channel outlet. Through this gastrotomy, a linear cutter stapler (endo GIA) was inserted with its jaws on either side of the septum, dividing the lesser curve channel to the body of the stomach. Multiple firings were made to divide the vertical septum, opening the stomach back up to its normal volume. A 200-ml balloon (Figure 1) was then inflated in the fundus of the stomach, and a linear cutter stapler was used to divide the stomach transversely just below this balloon, to give a proximal gastric pouch volume of 200 ml.

The small bowel was then measured fully stretched, and divided at its midpoint. The distal ileal end was brought up through a window in the transverse mesocolon and anastomosed to the proximal stomach pouch. The proximal jejunal limb (which is the biliopancreatic limb) was then brought down and anastomosed side-to-side to the ileum, 100 cm proximal to the ileocecal valve, giving a 100-cm common limb (Figure 2).

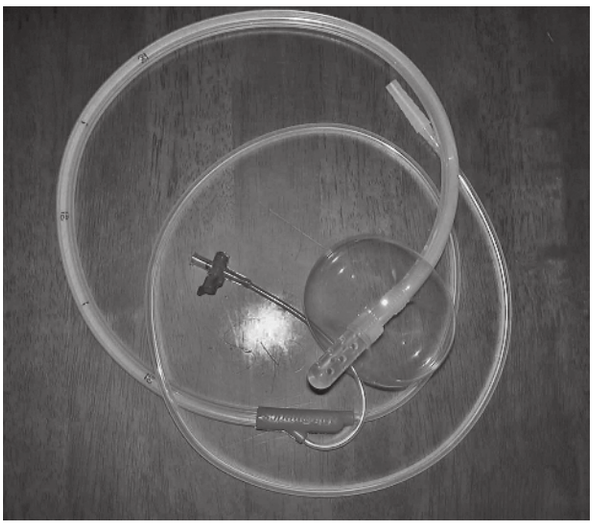

Figure 1. Balloon used to size the proximal gastric pouch. This balloon is inflated to 200 ml.

All mesenteric windows were then closed. After lavage of the peritoneal cavity, and placement of a drain in the gallbladder fossa and a second drain in the potential seroma cavity in the anterior abdominal wall, the abdomen was closed. A nasogastric tube was left in the proximal stomach. This operation is essentially a non-resectional Scopinaro BPD, with the antrum being left *in situ*.

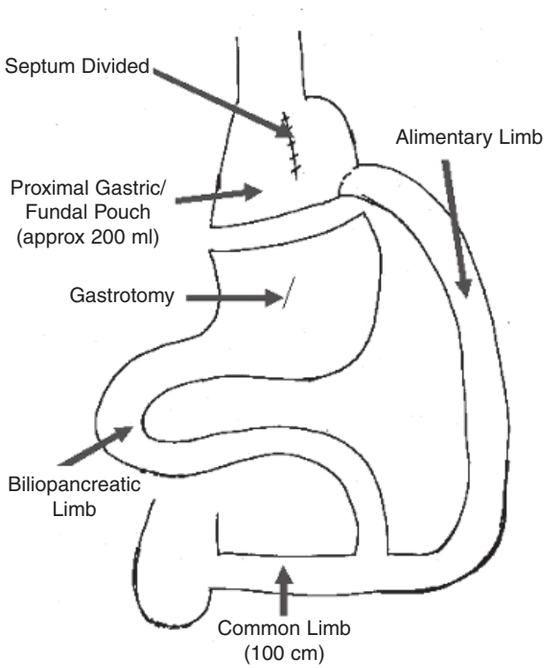

Figure 2. Schematic representation of non-resectional BPD, i.e. BPD with preservation of the distal stomach.

Postoperative Management

Postoperative care of the patients was conducted in the Nurse Special Unit for the next 48 hours. On the 3rd postoperative day, a routine Gastrografin® swallow was performed to exclude any leak or hold up from the gastric pouch. Once this was excluded, the I.V. infusion, drains and nasogastric tube were removed, and the patient was placed on fluids. Average length of hospital stay was 7-10 days.

All patients were commenced on a proton pump inhibitor postoperatively to reduce the risk of stomal ulcers, and on VitABDECK and Citrical + D (the main components of which are fat-soluble vitamins and calcium plus vitamin D, respectively).[9]

Results

A total of 20 patients underwent revisional BPD from June 2001 to April 2005. Of these patients, two were lost to follow-up by moving interstate and one patient died from delayed hepatic failure and sepsis 10 months postoperatively. This left us with 17 patients who underwent revisional BPD surgery, 9 of whom had a previous VBG revised to a non-resectional Scopinaro BPD by our technique.

The most common indication for revision in our series was staple-line disruption (Table 1), with 56% of patients undergoing revision for this reason. Figure 3 shows a disrupted staple-line seen during revision from VBG to BPD.

Table 2 lists the mean %EWL at intervals (3, 6, 12 and 24 months) postoperatively for VBG revised to the non-resectional BPD.

Table 1. Indications for revision from VBG to BPD

Reason for failure and need for revision	Percentage of patients
Staple-line disruption (Figure 3)	56%
Dilated gastric outlet, thus no hindrance to passage of food	11%
Dilated fundal pouch but intact staple-line	11%
Regained weight through forceful feeding	11%

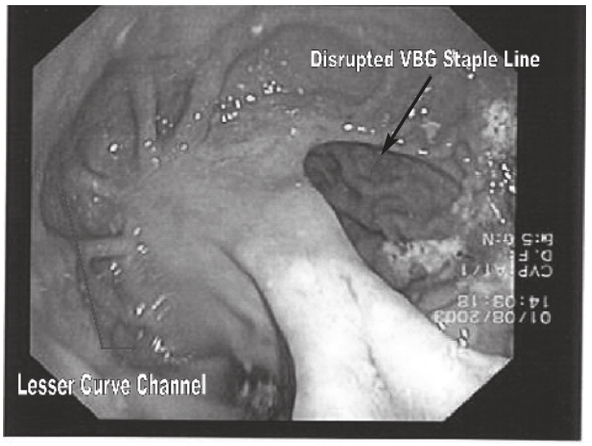

Figure 3. Photograph taken during revision of a VBG to BPD.

Complications

Complications postoperatively were categorized into minor and major groups (Tables 3 and 4, respectively). Minor complications were those which could be treated as an outpatient, and major complications were those requiring hospital inpatient treatment.

Discussion

Restrictive operations such as VBG, often have long-term failure of maintaining weight loss, and many require revision to a bypass. In the past, VBG has frequently been converted to a RYGBP followed by effective weight loss.[5] It is known that BPD to date is the most effective bariatric operation in terms of %EWL.[8] Therefore, it makes sense that revision to a BPD can be offered to patients who have had failure

Table 2. Mean %EWL at postoperative intervals for VBG revised to non-resectional Scopinaro BPD

Time Post-op	No. of Patients	Mean %EWL	SD
3 months	7	30.0	12.6
6 months	7	50.9	11.5
12 months	6	69.5	11.4
24 months	3	76.7	8.0

EWL = excess weight loss, using the Metropolitan Life tables. SD = standard deviation.

Table 3. Minor complications (i.e. able to be treated as outpatient) of the revision from VBG to BPD

Minor Complications	No. of patients (n) out of 9	Percentage of patients (%)
Nutritional complications	6	66.7
Wound infections	7	77.8
Vomiting	1	11.1
Abdominal pain	1	11.1
Wound hematoma (drained as outpatient)	1	11.1
Colocutaneous fistula (healed spontaneously)	1	11.1
Osteoporosis (on BMD)	1	11.1

BMD = bone mineral density
Nutritional complications were seen in 6 of the 9 patients: hypoalbuminemia; iron deficiency; low vitamin D, folate and calcium. Patients were prophylactically on Citrical + D (calcium citrate and vitamin D) and on fat-soluble vitamins.
Minor wound infections were commonly treated with a combination of Kaltostat dressings and/or oral antibiotics.

Table 4. Major complications (i.e. requiring inpatient treatment) of the revision from VBG to BPD

Major Complications	No. of patients (n) out of 9	Percentage of patients (%)
Perioperative deaths	0	0
Laparotomy (for anastomotic staple-line disruption)	1	11.1
Incisional hernia	1	11.1
Sepis, multi-organ failure (hepatic and renal)	1	11.11

of previous restrictive surgery. A literature review yielded several articles discussing BPD-DS as a revision option, but only one article discussing revision from VBG to the classical Scopinaro BPD.[10] Our series describes a new technique of VBG revision to a non-resectional Scopinaro BPD.

The classical BPD of Scopinaro leaves a somewhat larger gastric pouch but a 50-cm common-limb.[8] Because a revision operation should be effective but as safe as possible, preservation of the distal stomach can be a safe way of solving the problem of failed VBG, provided that too great an incidence of stomal ulcer is avoided. Leaving a somewhat smaller gastric pouch compensated for by a longer BPD common limb could be a valid option.

In this preliminary series, the most common cause for failure of previous VBG was staple-line disruption, and the mean preoperative BMI prior to the revision operation was 44.9. The mean %EWL at 12 and 24 months was 69.5 and 76.7, respectively. These results are comparable to %EWL after a primary BPD.[11] Our series found nutritional manifestations to be the most common of the minor complications, as would be expected from a malabsorptive operation.[9] Based on this knowledge, our patients were prophylactically commenced on fat-soluble vitamins and calcium supplements as well as a combination of iron and folate supplements, and were encouraged to increase their protein intake. Regular blood tests monitoring nutritional markers and scheduled follow-up with the dietician were vigorously undertaken.

Given the large amount of literature on previous failed restrictive surgery being revised to RYGBP with good long-term results,[5,12-14] and with the preliminary results of our series, we can infer that revision of a restrictive procedure to a malabsorptive one is a feasible and promising surgical option with acceptable complication rates. Our preliminary results pertaining to %EWL and complications in the revisional non-resectional BPD are comparable to other revisional malabsorptive procedures.

We acknowledge that our study involves a small sample. Also, the study is retrospective. Long-term prospective randomized controlled trials are needed to further evaluate effects of revisional non-resectional Scopinaro BPD and to ensure that the %EWL is reproducible.

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