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Original article

Single-anastomosis duodenoileal bypass as a second step after sleeve gastrectomy

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Abstract

Background: After sleeve gastrectomy, many surgical options are available in patients with insufficient weight loss. Duodenal switch is typically considered the operation that results in higher weight loss, although it is, perhaps unjustly, considered technically difficult and may be accompanied by severe side effects. Single-anastomosis duodenoileal bypass with sleeve gastrectomy is a simplification of the duodenal switch that may behave as a standard biliopancreatic diversion but is easier and quicker to perform. Given its effectiveness as a primary surgery we hypothesized that it would be successful as a second-step operation. The objective of this study was to analyze the weight loss and co-morbidities resolution after a single-anastomosis duodenoileal bypass (SADI) performed as a second step after sleeve gastrectomy.

Methods: Sixteen patients with an initial body mass index of 56.4 kg/m^2 and a mean excess weight loss of 39.5% after a sleeve gastrectomy were submitted to a single-anastomosis duodenoileal bypass with a 250-cm common channel.

Results: There were no postoperative complications. The mean excess weight loss was 72% 2 years after the second-step surgery. The complete remission rate was 88% for diabetes, 60% for hypertension, and 40% for dyslipidemia. The mean number of daily bowel movements was 2.1. One patient suffered an isolated episode of clinical hypoalbuminemia.

Conclusion: SADI is a safe operation that offers a satisfactory weight loss for patients subjected to a previous sleeve gastrectomy. The side effects are well tolerated, and complications are minimal. (Surg Obes Relat Dis 2014;▮:00–00.)

Keywords: Duodenoileal bypass; Sleeve gastrectomy; Staged surgery; Weight loss

Sleeve gastrectomy (SG) is a highly effective stand-alone surgical procedure for many morbidly obese patients and an adequate operation as a first step for super-obese (SO) patients or high-risk patients [1,2]. If weight loss after SG is inadequate, or if there is weight regain, different surgical options are available as a second step: resleeve, sleeve plication, banding of the sleeve, gastric bypass (GB), or duodenal switch (BPD-DS) [2].

For insufficient weight loss in a patient with a correct sleeve anatomy, we usually choose a malabsorptive procedure, especially if the patient was initially SO, as it offers the best weight loss for this subset of patients [3]. Five years ago, we introduced the single-anastomosis duodenoileal bypass with sleeve gastrectomy (SADI-S), a modified and

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simplified DS that has demonstrated satisfactory short- and long-term results [4]. After this success, we decided to introduce single-anastomosis duodenoileal bypass (SADI) as a second step after SG for insufficient weight loss. This study was approved by the Hospital Ethical Committee. The study is registered in ClinicalTrials.gov (NCT01685177).

Methods

From September 2009 to December 2012, 16 patients, 12 female and 4 male, subjected to an initial SG were selected for SADI as a second-step operation. In this period, 124 patients had been subjected to SG in our department, 46 programmed as a first step, 75 as a stand-alone procedure, and in 3 cases the SG was an intraoperative decision for technical difficulties. Twenty-nine patients (23%) have been submitted to a second step.

Attending to the SADI population, the mean age at the time of the sleeve operation was 42 years (18–62), the mean initial weight was 147 kg (99–216), the mean body mass index (BMI) was 56.4 kg/m^2 (41–71.5), and the mean excess weight was 82 kg (39–140). Nine patients (56%) were diabetics, 2 of whom were on insulin therapy; 10 patients (62%) had hypertension; and 10 (62%) had dyslipidemia. No intra- or postoperative complications presented after the SG. Patients were followed in a multidisciplinary basis every 3 months. A second step was offered if $<50\%$ excess weight loss was achieved, if the patient began to regain the weight after reaching an adequate weight nadir, and to every SO patient regardless of satisfactory weight loss after the 18th postoperative month. SADI was performed as a second step in all patients without problems derived from the SG, which could indicate dismantling of the sleeve (severe gastro-esophageal reflux), and without any accompanying conditions contraindicating a malabsorptive operation, such as liver cirrhosis or inflammatory bowel disease.

The mean time for the second-step operation was 24 months (16–38) after the initial operation, the mean excess weight loss (EWL) at the time of the reoperation was 39.5% and the mean BMI was 44 kg/m^2 (35.5–55.8). Four patients had achieved a EWL $>50\%$. Five patients out of 9 had remission of their diabetes after the SG, 4/10 had remission of hypertension, and 6/10 had remission of dyslipidemia.

Technique

The first operation was a standard SG performed over a 42–54 French gastric bougie. For SADI, patients were placed in the supine position with legs closed and the surgeon standing at the left-hand side of the patient.

After a complete evaluation of the abdomen, the distal end of the previous sleeve was identified, and with the stomach held upwards, dissection of the greater curvature was completed through the first segment of the duodenum, 2- or 3-cm distal to the pylorus. The posterior wall of the duodenum was separated from the pancreas down to the pancreatoduodenal groove and the gastroduodenal artery. After opening the peritoneum at the right margin of the duodenum with care not to damage the right gastric artery, the duodenum was encircled and divided with a 60-mm blue cartridge linear stapler. The ileocecal junction was located, and 250 cm was measured proximally at 10-cm intervals. The selected ileal loop was ascended antecolically and isoperistaltically anastomosed to the proximal duodenal stump with a 30-mm linear stapler and closure of the defect with a 2-layer suture [5] or with a 2-layer running suture hand-sewn anastomosis. The anastomosis was always covered with a TachoSil sponge (Takeda Pharmaceuticals, Zurich, Switzerland), and a vacuum drain was left behind.

Results

No intra- or postoperative complications were registered. The mean operative time was 114 minutes (45–160), and the mean postoperative hospital stay was 5 days (3–7). After discharge, all patients were maintained on a hypocaloric diet for 3 to 4 weeks, after which the patients were progressively introduced to a solid diet. Iron (100 mg daily), calcium (calcium citrate, 1200–2000 mg daily), and a multivitamin complex were also prescribed initially to all patients and were continued or discontinued based upon the analytical and clinical results. When necessary, vitamin D3, 10,000–30,000 IU/wk was also administrated.

All patients were evaluated at 3-month intervals from the operation. The mean follow-up time was 21 months (2–46). The mean EWL had been 39.5% at the time of the second-step operation and became 62.5% (43–80) at 6 months after the reoperation, 68.6% (49–83) after 12 months, 73% (57–87) after 18 months, and 72% (62.6–81.6) 2 years after the SADI (Fig. 1). The mean BMI was 35 kg/m^2 at 2 years after the revisional surgery (31.6–37) (Fig. 2).

In 8 patients (88.8%), a complete remission of diabetes was achieved, with all patients exhibiting values in the normal ranges of glycemia and glycated hemoglobin, and only 1 patient continuing treatment with 1 daily dose of metformin. Hypertension remitted in 60% of the cases, improved in 30%, and remained unchanged in 1 case. Dyslipidemia improved in all cases, with absolute normalization of all parameters in 40% of the cases.

The mean number of daily bowel movements was 2.1 (0–5), with only 2 patients reporting >3.

One patient had to be admitted in the first postoperative year for clinical hypoalbuminemia, which did not recur over the next 2 years. The analytical data after SG and in the second postoperative year after SADI are presented in Table 1. Table 2 summarizes oral supplements taken by the patients before and after SADI.

Up to now, no patient has presented signs of intestinal obstruction and no patient has been reoperated for an internal hernia.