ELSEVIER

Surgery for Obesity and Related Diseases ▮ (2017) 00–00

SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Diabetes resolution after one anastomosis gastric bypass

Adam Abu-Abeid, M.D.[a,1], Yonatan Lessing, M.D.[a,*,1], Niv Pencovich, M.D., Ph.D.[a], Danit Dayan, M.D.[a], Joseph M. Klausner, M.D[a], Subhi Abu-Abeid, M.D.[a,b]

[a]*Division of General Surgery, Tel Aviv Sourasky Medical Center, Tel-Aviv, Israel*
[b]*Bariatric Surgery Unit, Tel Aviv Sourasky Medical Center, Tel-Aviv, Israel*

Received August 12, 2017; accepted October 28, 2017

Abstract

Background: Diabetes and other obesity-related diseases are a worldwide pandemic that transcends geographic borders as well as socioeconomic levels. Currently, it is well known that medical treatment alone is insufficient to ensure adequate and sustainable weight loss and co-morbidity resolution. It has been well proven that bariatric surgery can produce almost immediate resolution of diabetes and other co-morbidities as well as long-term weight loss.

Objectives: Here, we present our experience with the one anastomosis gastric bypass (OAGB) in terms of weight loss and diabetes resolution with 1 year of follow-up.

Setting: Large, metropolitan, tertiary, university hospital.

Methods: A retrospective analysis of all patients who underwent OAGB between March 2015 and March 2016 was performed. Patient demographic characteristics, co-morbidities, operative and postoperative data, as well as first year outcomes were collected and analyzed.

Results: There were 407 patients who underwent OAGB (254 females, average age 41.8 ± 12.05 yr, body mass index = 41.7 ± 5.77 kg/m^2). Of patients, 102 (25.1%) had diabetes with average glycosylated hemoglobin of 8.64 ± 1.94 g%, 93 (22.8%) had hypertension, 123 (28.8%) had hyperlipidemia, and 35 patients (8.6%) had obstructive sleep apnea. The average length of hospital stay was 2.2 ± .84 days (range, 2–10 d). The average excess weight loss 1 year after surgery was 88.9 ± 27.3. After 1 year, follow-up data were available for more than 85% of the study's general population. Of 102 diabetic patients, only 8 (7.8%) were still considered diabetic and taking antidiabetic medication, with an average glycosylated hemoglobin of 5.4 ± 0.6.

Conclusions: OAGB may be performed safely and with promising efficacy as both a primary and a revisional bariatric surgery, and it offers excellent resolution of diabetes. (Surg Obes Relat Dis 2017;▮:00–00.)

Keywords: Bariatric; Mini gastric bypass; Diabetes; Obesity; BMI

The prevalence of obesity continues to increase worldwide. Correspondingly, the rates of type 2 diabetes (T2D) and other obesity-related diseases, including hypertension (HTN), hyperlipidemia (HL), cardiovascular disease, stroke, and obstructive sleep apnea, continue to grow. Bariatric surgery is currently the most effective modality for the treatment of morbid obesity, leading to substantial and persistent weight loss, improvement or resolution of co-morbidities, and even reduced mortality rates [1–3]. Although the remission of T2D after bariatric surgery has been recognized for many years, the type of bariatric surgery providing the most effective results is still under debate [3,4].

The one anastomosis gastric bypass (OAGB) was first described by Rutledge in 1997 [5] as a modification of the Mason loop gastric bypass, at which time it raised a number of controversies regarding gastric or esophageal biliary reflux that required revisional surgery, as well as the long-term risk of gastric and esophageal cancers [6–8].

*Correspondence: Yonatan Lessing, M.D, Tel-Aviv Sourasky Medical Center, 6 Weizmann St., Tel Aviv 64239, Israel.
E-mail: ylessing@gmail.com.il
[1]These authors contributed equally.

https://doi.org/10.1016/j.soard.2017.10.023

Nevertheless, encouraging reports followed thousands of these procedures being performed in recent years, including the procedure's short learning curve, the lower number of internal defects for herniation, and relatively simple revisions or reversals. These factors led to the procedure being gradually accepted again [9–13].

Recently, we have reported our early experience in OAGB, demonstrating its safety and weight loss efficacy [14]. In this study, we assess the early impact of OAGB on patients with T2D compared with those with nondiabetic obesity and evaluate the effect of OAGB on the glycemic status and antidiabetic medication usage in T2D patients 1 year after surgery.

Methods

Patients

Of patients who underwent OAGB between March 2015 and March 2016, 407 were retrospectively analyzed. Of these, 102 patients (25%) had T2D at the time of their surgery. Patients were considered diabetic if their fasting blood glucose was >125 mg/dL, their glycosylated hemoglobin (HbA1C) was >6%, or if they were receiving any hyperglycemic treatment. All patients complied with the guidelines of the American Society of Metabolic and Bariatric Surgery for bariatric surgery (i.e., a body mass index [BMI] ≥40 kg/m^2, or a BMI ≥35 kg/m^2 and one or more obesity-related co-morbidities). Peri- and postoperative data including complications, length of hospital stay, readmissions, reoperations, length of follow-up, percentage of excess weight lost (EWL), and T2D-related data were collected from follow-up notes, physicians' reports, and by telephone contact with the patients 1 year after surgery. Follow-up data were available for >85% of the study's general population and >95% of the diabetic patients, with <15% of patients lost to follow-up. The EWL was calculated by the standard formula (initial BMI − nadir BMI)/(initial BMI − 25) × 100%. We have used the accepted American Diabetes Association criteria to define complete and partial remission of T2D [15]. Complete remission of T2D was defined as cessation of antidiabetic medication usage, fasting blood glucose levels <100 mg/dL, and HbA1C <6%; partial remission was defined as subdiabetic hyperglycemia (HbA1C not diagnostic of diabetes [<6.5%]), and fasting glucose of 100 to 125 mg/dL.

The institutional review board approved this study. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Surgical technique

The operations were performed under general anesthesia with the patients in a supine position. A peripheral intravenous line and nasogastric tube were inserted. Insufflation of the peritoneal cavity was performed using a Veress needle. An 11-mm blunt trocar was inserted 3 cm above the umbilicus. Two 12- and two 5-mm trocars were inserted bilaterally in the midclavicular line above the level of the first trocar and in the midaxillary line subcostal, respectively. After exploration of the peritoneal cavity, a Nathanson retractor (Millennium Surgical ©) was used to retract the liver upward to visualize the esophagogastric junction area. The first step consisted of releasing the angle of His and to expose the left crus of the diaphragm, followed by dissection of the lesser curvature at the level of the crow's foot to enter the omental bursa. At this stage, the nasogastric tube was removed, and a 3.5-cm staple was stapled horizontally to this area. Several staples were stapled nearing the angle of His, while a 34 bougie was placed in the transected stomach. After this, a small bowel loop, 160 to 200 cm long, was anastomosed to the gastric pouch using a linear staple. The opening was closed manually using V-Lock sutures. At this point, a nasogastric tube was inserted until reaching the anastomosis, and blue dye was injected to ensure the patient's passage of content with no leaks. In addition, 2 Vicryl stitches were placed between the small bowel loop and the neostomach to prevent tension on the anastomosis. After these steps, hemostasis trocars were removed under vision and the skin was closed with Monocryl sutures.

Statistical analysis

Statistical analysis was performed using the IBM SPSS statistics data editor. The data are expressed in terms of means with the corresponding standard deviation. The Fischer and χ^2 tests were used for categoric data, and Student's t test was used for continuous data analysis. All P values were derived from 2-tailed tests.

Results

There were 407 patients who underwent OAGB between March 2015 and March 2016, and as mentioned, 102 of these patients were diagnosed with T2D before surgery. Demographic and preoperative data of T2D patients compared with non-T2D patients are described in Table 1. Almost half of the diabetic patients were male, compared with only approximately one third of non-T2D patients (Table 1). Moreover, patients with T2D were older, with a lower rate of a prior bariatric surgery and an increased rate of HTN and HL. T2D patients had a lower rate of arthritis compared with non-T2D patients (Table 1). There was no significant difference in preoperative BMI demonstrated between patients with and without T2D (Table 1).