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Surgery for Obesity and Related Diseases 10 (2014) 71–78

SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Five-year outcome after gastric bypass for morbid obesity in a Norwegian cohort

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Received February 18, 2012; accepted May 10, 2013

Abstract

Background: Few long-term reports with high rates of follow-up are available after gastric bypass. We report changes in weight, co-morbidity, cardiovascular risk, and health-related quality of life (HRQoL) 5 years after gastric bypass.

Methods: Patients who had gastric bypass (2004–2006) were included. Prospective data were reviewed. Long-term complications, cardiovascular risk factors, and HRQoL were evaluated, and the 10-year risk for coronary heart disease was estimated (Framingham risk score). Outcomes were compared in patients with body mass index (BMI) <50 and ≥ 50 kg/m^2.

Results: A total of 184 of 203 patients (91%) met to follow-up. The mean ± SD preoperative BMI was 46 ± 5 kg/m^2, and the mean ± SD age was 38 ± 9 years; 75% were women. Thirty-two percent of the patients had a BMI ≥ 50 kg/m^2, and 30% had type 2 diabetes. Follow-up was 63 ± 5 months. After 5 years, total weight loss was 27% ± 11%. Remission of type 2 diabetes had occurred in 67%. The prevalence of hypertension, dyslipidemia, sleep apnea, and metabolic syndrome had decreased. HRQoL was improved. The Framingham risk score was reduced (5.6% versus 4.6%; $P = .021$). Sixty-one patients (33%) had long-term complications, most commonly chronic abdominal pain (10%). BMI was 33 ± 5 and 37 ± 7 kg/m^2 in patients with preoperative BMI <50 and ≥ 50 kg/m^2, but changes in metabolic, cardiovascular risk profile and HRQoL were broadly similar.

Conclusions: Beneficial effects on weight loss, cardiovascular risk, and HRQoL were documented 5 years after gastric bypass in morbidly and super-obese patients. (Surg Obes Relat Dis 2014;10:71–78.)

Keywords: Bariatric; Gastric bypass; Obesity; Follow-up studies; Quality of life; Weight loss; Cardiovascular risk; Treatment outcome

Bariatric surgery provides substantial and sustained weight loss in morbidly obese patients [1,2]. Studies report favorable effects on obesity-related co-morbidities, risk factors for cardiovascular disease, and health-related quality of life (HRQoL) [2–5]. In super-obese individuals (body mass index [BMI] ≥ 50 kg/m^2), Roux-en-Y gastric bypass has been associated with less favorable weight loss, which may negatively affect outcome, such as changes in obesity-related co-morbidities [6,7].

Long-term outcome data after gastric bypass are sparse and often limited by low rates of follow-up. This is a concern, because studies indicate inferior outcome after surgery in patients who do not attend follow-up [8,9].

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1550-7289/14/$ – see front matter
http://dx.doi.org/10.1016/j.soard.2013.05.003

In Norway, bariatric surgery was initiated at several public hospitals in 2004. In these hospitals, patients are recruited from defined geographic areas and followed at regular visits after surgery. The aim of this study was to evaluate long-term weight loss, obesity-related co-morbidities, complications, and HRQoL in a single-center gastric bypass cohort with a high rate of follow-up. We also wanted to compare the outcomes in morbidly obese and super-obese patients.

Methods

Study design and patient inclusion

This study included all patients who had gastric bypass for morbid obesity at the University Hospital from June 2004 to December 2006 and who had attended 5-year follow-up by June 2012. A written informed consent was retrieved from the patients, and data were registered in a database licensed by The Norwegian Data Inspectorate. Preoperative data were registered retrospectively until December 2005. Subsequent preoperative and postoperative data were collected prospectively on predefined forms. The Regional Ethics Committee approved the protocol for analysis of HRQoL.

Patients were eligible for surgery if they were aged 20–60 years, had a BMI $\geq$40 kg/m^2 or BMI $\geq$35 kg/m^2 with obesity-related co-morbidities, and failed previous attempts of sustained weight loss.

Before surgery, all patients had individual consultations with a nurse, a dietician, a surgeon, and in some cases, a psychologist. This included a record of past medical history, current medication, and a physical examination. The patients attended a preoperative 40-hour program to promote knowledge about surgical, psychological, and nutritional aspects of gastric bypass surgery.

Operative technique and postoperative management

A standardized 5-port laparoscopy set-up was used [10]. A gastric pouch of 25–30 mL was constructed. An antecolic and antegastric gastrojejunostomy was created. The alimentary limb length was 150 cm and the biliopancreatic limb was 50 cm. The mesenteric defects were not closed. The patients were operated by the same 2 surgeons.

At discharge, daily oral supplementation of multivitamins, 100–200 mg of iron sulfate, 1000 mg of calcium carbonate, and 800 IU of vitamin D_3, were prescribed. Patients also received a vitamin B_{12} injection of 1 mg every third month. Ursodeoxycholic acid (500 mg daily) was prescribed for 6 months in patients with the gallbladder in situ.

Postsurgery visits were scheduled at 6 weeks, 6 months, 1 year, 2 years, and 5 years or more. All 5-year visits were performed by the same 2 physicians except for 2 patients consulted in other bariatric hospitals using our case report forms. Patients were asked whether they had been admitted to any hospital or undergone abdominal surgery. Records of surgical procedures were retrieved if type of surgery was uncertain. Long-term complications denote complications occurring $>$30 days after surgery.

Outcomes

For evaluation of long-term outcome, preoperative measures were compared with findings at the 5-year follow-up. Weight, however, was retrieved from all standard consultations to enable description of weight development. Weight was measured using a platform weight, Seca 635, III (0–300 kg) with light clothing and no shoes. Waist circumference was measured halfway between the lowest rib and the iliac crest and hip circumference at the great trochanters. Percent of excess weight loss (%EWL) was defined as ([preoperative weight – current weight] / [preoperative weight – ideal weight]) $\times$ 100. Ideal weight was calculated as the weight corresponding to a BMI of 25 kg/m^2. Percent excess BMI loss (%EBMIL) was defined as ([preoperative BMI − current BMI] / [preoperative BMI − 25]) $\times$ 100 [11].

Co-morbidities were registered from information given by the patients and from referrals, clinical assessment, and blood samples obtained after an overnight fast. Type 2 diabetes was defined as either a fasting plasma glucose $\geq$7 mmol/L, a glycated hemoglobin (HbA_{1c}) $\geq$6.5%, or the use of antidiabetic medication. Hypertension denotes a resting blood pressure $\geq$140/90 mm Hg or the use of antihypertensive medication. Dyslipidemia was defined as fasting concentrations of LDL-C of $\geq$3.0 mmol/L, HDL-C $<$1.0 mmol/L (men) or $<$1.3 mmol/L (women), triglycerides $>$1.7 mmol/L, total-cholesterol/HDL-C-ratio $>$5, or the use of lipid-lowering medication [12]. If sleep apnea was suspected, patients were referred to polysomnography before surgery. Gastroesophageal reflux disease was diagnosed on the basis of self-reported symptoms or the use of antireflux medication.

The metabolic syndrome was defined according to the worldwide International Diabetes Federation definition [13]. The 10-year risk for coronary heart disease was estimated using the Framingham risk score model by Wilson et al. [14]. Patients aged $<$30 years and patients with a history of coronary heart disease were excluded because of model restrictions. Patients were classified as having low, intermediate, or high risk for coronary heart disease based on their estimated preoperative 10-year risk score of $<$10%, 10%–20%, or $>$20%, respectively. We also recorded cardiovascular events at the 5-year follow-up.

Patients completed the Norwegian version of the Short Form-36 Health Survey (SF-36), version 2.0 (4-week recall) [15] and an obesity-specific HRQoL questionnaire, the Obesity-related Problems scale (OP-scale) [16]. OP-scale has been validated for measuring the effect of obesity on psychosocial functioning. The questionnaire comprises 8 items on a 4-point response scale. Patients were asked how