



Surgical Morbidity in the Elderly Bariatric Patient: Does Age Matter?

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Published online: 16 April 2019

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Abstract

Background Obesity is a global health problem that also affects older adults. In Chile, as in most of the developing countries, more than half of older adults are overweight or obese, and bariatric surgery may be riskier for this group. The aim of this study is to compare our experience in patients over 60 years of age with a control group to determine associated surgical morbidity and mortality.

Methods Case-control study of bariatric surgeries performed between 2006 and 2017 in our institution. Patients aged ≥ 60 years for the case group versus control group for patients ≤ 50 years selected randomly, matched by body mass index, type 2 diabetes, hypertension, dyslipidemia, surgical technique, and gender (ratio 1:2). Primary endpoint was surgical morbidity, 30-day readmission, and mortality.

Results Seventy-two patients in case group were matched with 144 patients in control group. Surgical complications rate was the same for both groups. No differences were observed in the conversion to open surgery rate or 30-day readmission rate. There was no mortality in this series.

Conclusion In this case-control study, being elderly does not increase the risk of morbidity and mortality associated with bariatric surgery.

Keywords Bariatric surgery · Elderly · Morbidity · Mortality · Risk factors

Introduction

Obesity and its related diseases are a global health problem; in 2016, the World Health Organization (WHO) stated that 39% of adults are overweight and about 13% of the adult population worldwide has obesity [1]. With the increase in life expectancy, we are confronted with a population of older adults with increasing obesity. According to some series, bariatric surgery is an effective and safe option for these patients, with a remission rate of comorbidities and postoperative complications similar to middle-aged patients [2, 3] thereby decreasing cardiovascular risk. However, other studies suggest that bariatric surgery was associated with low mortality but increased morbidity, mainly due to respiratory and/or cardiovascular complications, not necessarily because of surgical complications [4]. Other authors affirm that, along with age older than 65 years, surgical complications and mortality increase [5]. A recent systematic review reported a higher number of complications in elderly patients and a lower rate of comorbidity improvement [6]. The objective of this study

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was to compare our experience in patients over 60 years of age with a control group to determine associated morbidity and mortality.

Methods

This is a case-control study of bariatric surgery performed between 2006 and 2017 in our institution, having obtained approval from the scientific ethics committee of our hospital. The inclusion criteria were all operated patients greater than or equal to 60 years for the case group who were compared with a control group of patients less than or equal to 50 years obtained randomly, paired by gender, body mass index (BMI), type 2 diabetes mellitus (T2D), hypertension, dyslipidemia, and surgical technique in a 1:2 ratio. The exclusion criteria were patients between 51 and 59 years old, who did not fit into any of the selected groups. The variables analyzed were age, BMI, surgical procedure, comorbidities and intraoperative and postoperative complications (less than 30 days). Primary endpoint was surgical morbidity, 30-days of readmission, and mortality. All patients admitted to the program of the bariatric and metabolic surgery center underwent abdominal ultrasound, upper gastrointestinal endoscopy, electrocardiogram, chest x-rays, and complete laboratory analysis. In addition, female patients underwent bone densitometry, and in long-standing diabetic patients, dilated-pupil fundus examination was performed. Once the preoperative study was completed, a multidisciplinary committee discussed each patient individually, resulting in a decision about the procedure. There were three surgical procedures: sleeve gastrectomy (SG), sleeve gastrectomy with jejunal bypass (SGJB), and Roux-en-Y gastric bypass (RYGB). Sleeve gastrectomy with jejunal bypass as a bariatric/metabolic procedure has been previously published by our group and others [7–9].

Statistical Analysis

Differences in categorical variables were analyzed with Pearson chi-square, continuous variables with Student's *t* test for variables with normal distribution, and Mann-Whitney *U* test for variables with non-normal distribution. The association analysis between the groups and surgical techniques was performed with chi-square, and the analysis of each technique in particular with Student's *t* test. Statistical significance was considered with a *p* value < 0.05. Stata 14.0 (StataCorp, College Station, Texas, USA) was used for the analysis.

Results

Out of a total of 1818 surgeries in the database, 72 patients (3.9%) met the inclusion criteria (case group) and were

matched by gender, BMI, T2D, hypertension, dyslipidemia, and surgical technique with 144 patients under 50 years (7.8%), obtained randomly (control group). The preoperative characteristics such as anthropometrics, demographics, and comorbidity data of the patients are presented in Table 1. Median BMI in both groups was 38 ± 5.6 kg/m² and 37.9 ± 5 kg/m², (*p* = 0.691). The frequency of the procedures was the same in both groups: SGJB 40.2%; SG 31.9%; RYGB 27.7%. The surgical morbidity is presented in Table 2. There were two postoperative complications in the case group (2.8%). They consisted of one case of perihepatic hematoma in the context of a simultaneous cholecystectomy, and one gastric intramural hematoma in sleeve gastrectomy, both without reoperation. There were four complications in the control group (2.8%) which consisted of two patients with episodes of gastrointestinal bleeding (one SGJB and one SG), one case of bleeding of the anastomosis with a partially obstructing hematoma in RYGB (with no reoperation), and one patient with a hemothorax secondary to the dissection of a hiatal hernia concomitant to a SG. This hemothorax was the only one that required reoperation. Conversions to laparotomies were due to adhesions of previous surgeries with the consequent technical difficulty that this implies (three patients from the case group (4.2%) and only one patient from the control group (0.69%), *p* = 0.074). The causes for the conversions are the following: in the case group, multiple previous laparotomies, one of them was a splenectomy; in the control group, female patient, lap-band removal with extensive adhesions, finally converted via laparotomy to SGJB. There were no readmissions in the first 30 days nor mortality.

Discussion

In recent years, the number of elderly patients with obesity has increased worldwide [1] and a growing number of people over 60 are undergoing bariatric surgery. This case-control study concludes that in our high-volume center, this subgroup of patients does not experience a higher risk of complications, even when submitted to procedures with intestinal bypass such as RYGB and SGJB, which pose more risk of complications such as digestive bleeding. In the literature, there are reports indicating that surgery in elderly patients can be performed with good outcomes, without an increase in morbidity and mortality [4, 10–15]. Some authors even observed a lower rate of complications in these patients [16–19]. On the other hand, recently, Giordano et al. [4] published a meta-analysis that compared RYGB in patients older than 60 years, finding an increase in postoperative morbidity and less effectiveness in excess weight loss and resolution of comorbidities compared with younger patients, a phenomenon also observed in other publications, with other procedures [5, 6, 20, 21]. A more recent systematic review by Marczuk et al. [6] reported

Table 1 Preoperative characteristics of patients of case and control groups

Variables	Case group (≥ 60 years)	Control group (< 50 years)	<i>p</i> value
<i>n</i>	72	144	1:2
Age, years	62.5 \pm 3	41.7 \pm 9	< 0.001
Female (%)	77.7	70.8	1.000
BMI (kg/m ²)	38.0 \pm 5.6	37.9 \pm 5	0.691
Comorbidities			
Total	1.14	0.74	0.870
Hypertension (%)	75	71.5	0.589
T2DM (%)	58.3	57.6	0.922
Dyslipidemia (%)	51.4	51.4	1.000
Surgical procedures			
SG (%)	31.9	31.9	
RYGB (%)	27.8	27.8	
SGJB (%)	40.3	40.3	

Case group, patients ≥ 60 years; Control group, patients ≤ 50 years; BMI, body mass index; T2DM, type 2 diabetes mellitus; SG, sleeve gastrectomy; RYGB, Roux-en-Y gastric bypass; SGJB, sleeve gastrectomy with jejunal bypass

Quantitative variables presented as median \pm interquartile range
1:2 ratio

higher morbidity and mortality in the elderly patients. However, these results may be due to inclusion of older studies, inclusion of patients with open surgery, and patients who underwent only RYGB. In general, the most common early complication is surgical site infections [22], which did not appear in our series. Despite the divergent results, even the most pessimistic series conclude that bariatric and metabolic surgery in older adults is a valid and safe alternative. When comparing the risk/benefit that bariatric surgery gives to the patient, all authors recognize its usefulness to a greater or lesser extent. It is important to acknowledge that elderly patients have more prevalence of comorbidities such as hypertension, dyslipidemia, and T2DM; this is in line with other publications [13, 18, 19, 23–26]. This characteristic may be a source of bias favoring complications in the aged group, so a matched case-control study might be the best way to address this matter. A recently published case-control study with similar number of patients and design reached the same conclusions [26].

The choice of the procedure in our center was determined mainly by the number of comorbidities and/or the presence of gastroesophageal reflux, having preference for SGJB (40.3%) as a metabolic surgery in older patients (due to its lower

technical complexity and lower rate of nutritional complications than RYGB) [9]. The conversion to open surgery rate in our database of 1818 patients is 0.3%, and it was found to be increased in the older patients' group (4.2%). This is mainly due to a higher prevalence of previous laparotomies. Nevertheless, our control group presented a similar conversion rate, determined simply by chance when choosing the sample, which indicated that there was no significant difference in this variable.

So far, we present data on the safety and risks of bariatric procedures in older patients; however, we must ask: what real and lasting benefits we can provide our patients with surgery? When we decide to operate on an elderly patient with metabolic diseases, we must take into account the time of diagnosis of that patient and the damage in his organism due to the most prevalent chronic diseases. Assuming that, in these patients, surgery is probably too late, with some damage already done. Although, we can improve their remaining quality of life and decrease the associated risks. In Chile, life expectancy at birth is 80 years for men and 85 years for women [27]. The risk of dying from diabetes was 25% higher in men than in women. This risk increases with age and acquires special relevance

Table 2 Surgical complications

	Case group (≥ 60 years)	Control group (< 50 years)	<i>p</i> value
Complications	2 (2.8%)	4 (2.8%)	1.000
Reoperation (hemothorax)	0 (0%)	1 (0.7%)	0.478
Conversion to open surgery	3 (4.2%)	1 (0.7%)	0.074
Mortality	0 (0%)	0 (0%)	1.000

after the age of 60 years old [28]. We conclude that, if we can provide a safe metabolic surgery, without increasing the complications inherent in any procedure, in a 60-year-old patient, obese, and diabetic, we can improve their quality of life (such as nourishment, decreasing medications, improving osteo-articular diseases due to overweight, and decreasing the risk of death from diabetes and cardiovascular events) in the next 20 years if it is a man and 25 years if it is a woman, what we consider to be a considerable period of time.

There are some limitations in this study. It is a retrospective study with a relatively low number of patients, but matched 1:2 to decrease the risk of bias. Comorbidities remission and weight loss are unknown at the moment.

Conclusions

In this case-control study, in a high-volume center, the group of patients older than 60 years did not present a greater risk of morbidity and mortality than the control group. Also, no difference was found in 30 days of hospital readmissions. Probably, risk of conversion to open surgery is increased by a higher prevalence of previous laparotomies. To confirm these results, large numbered studies are needed. It is of interest to carry out studies with a long-term follow-up to evaluate the survival rate, weight loss, and remission of comorbidities in these patients.

Acknowledgments The authors thank statistics Professor Waldo Aranda, from the School of Medicine of Universidad Diego Portales for his valuable help in the statistical analysis and in writing the “Methods” section.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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