

Assessment of Bariatric Surgery in a Regional Hospital Setting: Morbidity, Mortality, and Medium-Term Clinical Outcomes in a Cohort of 163 Patients

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Abstract

Original Research Article

Background and Objective: Bariatric surgery is currently established as the gold standard treatment for morbid obesity. This study aims to evaluate the surgical practices, morbidity, mortality, and clinical outcomes of this discipline at the Victor Jousselin Regional Hospital in Dreux over a seven-year period (from July 1, 2016, to June 30, 2023). **Materials and Methods:** This is a single-center, descriptive, and retrospective study involving a consecutive cohort of 163 patients who underwent bariatric surgery. **Results:** The cohort comprised 126 females and 37 males, with a mean age of 41.4 years. The mean preoperative body mass index (BMI) was 42.1 kg/m², with 64% of the patients suffering from morbid obesity. At least one obesity-related comorbidity was documented in 87.1% of the individuals. Sleeve gastrectomy was the preferred surgical intervention (87% of cases), followed by Roux-en-Y gastric bypass (13%). The mean length of hospital stay was 3.3 days, associated with an early morbidity rate of 1.8% and zero mortality. Medium-term follow-up demonstrated a mean absolute weight loss of 34.7 kg at one year, 33.7 kg at three years, and 25.8 kg at five years. Complete remission of type 2 diabetes mellitus was observed in 57.1% of cases. **Conclusion:** Experiencing rapid expansion in developed countries, bariatric surgery demonstrates substantial metabolic and weight loss benefits while maintaining an excellent safety profile within a regional hospital setting. These findings advocate for the democratization of this comprehensive care in regional reference centers, particularly in developing countries where it remains marginal.

Keywords: Bariatric surgery; sleeve gastrectomy; gastric bypass; obesity.

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INTRODUCTION

Obesity constitutes a chronic disease exhibiting a constant upward trajectory, establishing itself as one of the major global public health threats. According to the World Health Organization (WHO), approximately 13% of the global adult population suffered from obesity in 2016, a proportion projected to reach 25% by the year 2045 [1]. At the national level, the 2020 OBEPI-ROCHE epidemiological survey highlighted a prevalence of 17% for obesity and 47.3% for overweight status in France [2]. This epidemic is accompanied by deleterious cardiovascular, metabolic, and psychological complications, leading to premature excess mortality.

In this context, bariatric surgery has asserted itself as the mandatory therapeutic strategy for the management of morbid obesity [3]. In addition to significant weight reduction, it offers a curative solution for various obesity-associated comorbidities, including

arterial hypertension (HTN), type 2 diabetes mellitus (T2DM), obstructive sleep apnea syndrome (OSAS), and dyslipidemia. This proven efficacy has propelled its widespread deployment: over the span of two decades, the annual volume of bariatric interventions in France has increased twentyfold, rising from 2,800 procedures in 1997 to nearly 60,000 in recent years [4].

While this surgical discipline was initially the exclusive domain of hyper-specialized university centers, it is progressively being democratized within regional hospital centers (CHR). A rigorous evaluation of surgical practices and clinical outcomes within these community-based facilities is essential to ensure the homogeneity, quality, and safety of care across the entire territory.

The objective of this study is to analyze the practice of bariatric surgery at the Victor Jousselin

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Hospital in Dreux between July 1, 2016, and June 30, 2023. Specifically, this study aims to evaluate the weight loss trajectory, the remission of comorbidities, and the short- and medium-term morbidity and mortality in a cohort of 163 patients.

MATERIALS AND METHODS

Study Design and Patient Population

This observational, descriptive, single-center study was conducted within the Department of General and Digestive Surgery at the Victor Jousselin Hospital in Dreux. It exhaustively included consecutive patients who underwent a bariatric intervention over a seven-year period (from July 1, 2016, to June 30, 2023). To ensure the relevance of the medium-term analysis, individuals with a postoperative follow-up of less than six months were excluded from the study.

Preoperative Assessment

Surgical eligibility was rigorously evaluated in accordance with the guidelines set forth by the French National Authority for Health (HAS). Each candidate underwent a standardized multidisciplinary evaluation pathway systematically comprising: an endocrinological and nutritional assessment, a psychiatric evaluation screening for eating disorders (ED), a polysomnography for OSAS screening, and a hepatogastroenterological evaluation including an esophagogastroduodenoscopy (EGD) for the detection and eradication of *Helicobacter pylori*. The final indication for surgery was systematically validated collegially during a Multidisciplinary Team (MDT) meeting.

Surgical Techniques

All procedures were performed via a laparoscopic approach under general anesthesia. Two distinct surgical techniques were utilized, based on the indications established during the MDT meetings:

- **Laparoscopic Sleeve Gastrectomy (SG):** The gastric tube was calibrated using a 34-French Midsleeve bougie via linear ascending stapling. The staple lines were systematically reinforced with a bioabsorbable material (Seamguard) at the level of the esophagogastric junction.
- **Roux-en-Y Gastric Bypass (RYGB):** This procedure involved the creation of a restricted

gastric pouch and an antecolic alimentary limb, coupled with a mechanical side-to-side gastrojejunostomy. Systematic closure of the mesenteric defects was routinely performed to prevent the risk of internal herniation.

Data Collection and Definitions

Study parameters were extracted from computerized electronic medical records (USV2 software). The analysis encompassed sociodemographic characteristics, baseline BMI, comorbidities, intraoperative data, early (≤ 30 days) and late postoperative morbidity and mortality, as well as the evolution of the percentage of excess weight loss (%EWL) at 3, 6, 12, 36, and 60 months. Quality of life was assessed utilizing a self-administered questionnaire. Complete remission of T2DM was defined as the achievement of normoglycemia and an HbA1c level of $\leq 6\%$, without the use of antidiabetic medications for at least three consecutive months. Analogous temporal and clinical criteria for medication cessation were employed to define the remission of HTN, dyslipidemia, and OSAS.

Statistical and Ethical Analysis

Data processing and statistical analyses were performed using Epi Info software, version 7.2.1. Patient anonymity was strictly maintained; access to medical records was formally authorized by the Head of the Department and the institution's Data Protection Officer.

RESULTS

Population Characteristics

Over the study period, 163 patients underwent surgery. The cohort exhibited a strong female predominance (male-to-female ratio of 0.29) and a mean age of 41.45 years (± 11.10), ranging from 21 to 67 years. The mean baseline BMI was 42.08 kg/m² (± 5.77), indicating a majority of patients with morbid obesity. A hereditary component of obesity was reported by 87.1% of the patients. Furthermore, 87.1% of the individuals suffered from at least one obesity-related comorbidity, the most prevalent being osteoarthritis, OSAS, HTN, dyslipidemia, and T2DM. The baseline characteristics are detailed in Table I.

Table I: Baseline Characteristics of the Study Population (n = 163)

Characteristics	Count (n)	Percentage (%) or mean
Sociodemographic Data		
Mean age (years)	163	41.45 $\pm$ 11.10
Female sex	126	77.3%
Male sex	37	22.7%
Weight Characteristics		
Mean BMI (kg/m ²)	163	42.08 $\pm$ 5.77
Morbid obesity (BMI > 40 kg/m ²)	104	64.0%
Severe obesity (BMI 35-40 kg/m ²)	59	36.0%
Snacking and Binge eating	124	76.1%

Characteristics	Count (n)	Percentage (%) or mean
Obesity-Related Comorbidities		
Presence of at least one comorbidity	142	87.1%
Osteoarthritis	111	68.1%
Obstructive sleep apnea syndrome (OSAS)	94	57.7%
Arterial hypertension (HTN)	45	27.6%
Dyslipidemia	29	17.8%
Depression	26	15.9%
Asthma	23	14.1%
Type 2 Diabetes Mellitus	21	12.9%

Interventions and Postoperative Course

Sleeve gastrectomy was the vastly predominant procedure (141 cases, representing 87%), followed by gastric bypass (22 cases, representing 13%). Only two intraoperative adverse events (1.22%) were recorded: one conversion to laparotomy during a RYGB and one iatrogenic liver laceration during a SG. The length of

hospital stay, averaging 3.3 days (± 2), was found to be significantly longer for RYGB (5.6 days) compared to SG (2.98 days, $p=0.000$). The mortality rate within our series was zero. The overall early morbidity rate was contained at 1.84%. Late morbidity affected only four patients, occurring exclusively in the RYGB group.

Table II: Distribution of Early and Late Complications According to Surgical Technique (n = 163)

Complications	Sleeve Gastrectomy	Gastric Bypass	Total
Early	01	02	03
Fistula	01	00	01
Acute bowel obstruction	00	01	01
Pulmonary embolism	00	01	01
Late	00	04	04
Anastomotic ulcer	00	03	03
Cholelithiasis	00	01	01
Total	01	06	07

Weight Loss Outcomes

Weight loss was significant within the first few postoperative months. The evolution of the mean percentage of excess weight loss (%EWL) was as follows:

- **At 6 months:** The mean %EWL reached 60.5%, with no statistically significant disparity between the two surgical techniques ($p=0.47$).

Table III: Distribution of %EWL at 6 Months According to Surgical Technique (n = 163)

%EWL	Sleeve Gastrectomy	Gastric Bypass	Total
Less than 25%	1	0	1
[25-50[%	41	7	48
[50-75[%	72	8	80
75% and above	27	7	34
Total	141	22	163

- **At 1 year:** The loss to follow-up (LTFU) rate was 12.76%. The mean %EWL peaked at 75.1%, remaining without a significant difference between RYGB and SG ($p=0.19$).

Table IV: Distribution of %EWL at 1 Year According to Surgical Technique (n = 123)

%EWL	Sleeve Gastrectomy	Gastric Bypass	Total
Less than 25%	1	0	1
[25-50[%	11	2	13
[50-75[%	45	6	51
75% and above	47	11	58
Total	104	19	123

- **At 3 years:** The LTFU rate climbed to 45.9%. The mean %EWL slightly eroded, settling at 68.5% ($p=0.08$ between groups).

Table V: Distribution of %EWL at 3 Years According to Surgical Technique (n = 40)

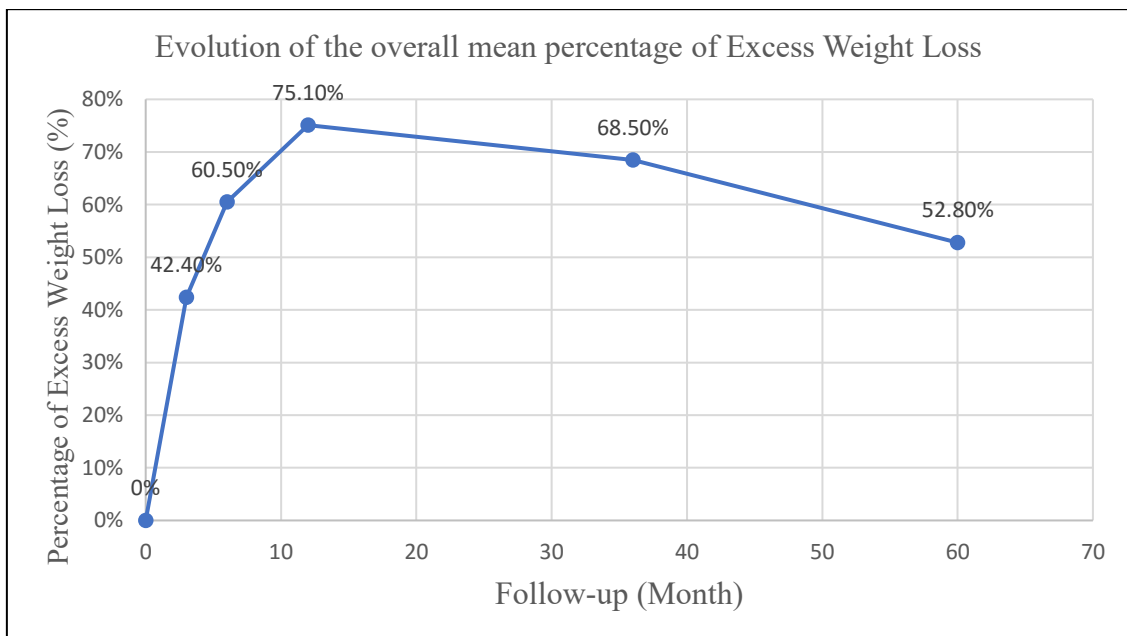
%EWL	Sleeve Gastrectomy	Gastric Bypass	Total
Less than 25%	1	0	1
[25-50[%	9	1	10
[50-75[%	13	1	14
75% and above	11	4	15
Total	34	6	40

- **At 5 years:** Attrition became major, with 64.86% of patients lost to follow-up. The mean %EWL stabilized at 52.8%. At this stage, a statistically

significant difference emerged in favor of the Roux-en-Y gastric bypass concerning absolute weight loss ($p=0.048$).

Table VI: Distribution of %EWL at 5 Years According to Surgical Technique (n = 13)

%EWL	Sleeve Gastrectomy	Gastric Bypass	Total
Less than 25%	2	0	2
[25-50[%	4	0	4
[50-75[%	4	1	5
75% and above	1	1	2
Total	11	2	13

**Figure 1: Evolution of the overall mean percentage of Excess Weight Loss (%EWL) following bariatric surgery**

It is noteworthy that only a single surgical revision for weight loss failure was recorded, which consisted of a conversion from a sleeve gastrectomy to a gastric bypass after seven years of follow-up.

Remission of Comorbidities

Clinical follow-up demonstrated excellent complete remission rates for the primary metabolic and respiratory conditions:

- **Type 2 Diabetes Mellitus:** 57.1% remission rate (12/21 patients), with a mean time to remission of 10.4 months.
- **OSAS:** 58.5% remission rate (55/94 patients), with a mean time to remission of 11.85 months.
- **Arterial Hypertension:** 26.7% remission rate (12/45 patients), with a mean time to remission of 9 months.

- **Dyslipidemia:** 20.7% remission rate (6/29 patients), with a mean time to remission of 11 months.

DISCUSSION

Feasibility and Safety in a Regional Hospital Setting

The most compelling finding of this series lies in the complete absence of postoperative mortality and the remarkably low rate of early morbidity (1.84%). Historically, the medical literature reported mortality rates fluctuating between 0.16% and 0.58% for RYGB, and approximately 0.19% for SG [5]. Our data corroborate the recent reports from surgical registries, which underscore the high safety profile of bariatric surgery when performed within a standardized framework [6]. The decentralization of these

interventions toward regional hospitals fully demonstrates its relevance here: owing to a stringent enhanced recovery protocol and multidisciplinary follow-up, complication rates (such as the 0.7% fistula rate following SG in our series) prove to be perfectly comparable to those of major tertiary reference centers.

Evolution of Surgical Practices and Epidemiology

The demographic profile of the cohort—characterized by a female predominance (77.3%) and a mean age of 41.4 years—faithfully mirrors that of large Francophone cohorts. Similarly, the supremacy of the sleeve gastrectomy in our institution (87% versus 13% for the bypass) illustrates the global trend highlighted by recent IFSO surveys [7]. While the gastric bypass remains the gold standard strategy for long-standing diabetes or severe gastroesophageal reflux disease, the sleeve gastrectomy has established itself as the first-line procedure due to a more forgiving learning curve and a highly favorable short-term risk/benefit ratio [8].

Medium-Term Weight Loss and Metabolic Efficacy

The weight loss kinetics of our patients delineate a peak in efficacy at one year (mean %EWL of 75.1%), followed by a classic progressive erosion. At five years, the gastric bypass offers a statistically significant advantage in terms of absolute weight loss. Concurrently, these surgical interventions achieved a complete remission of T2DM in 57.1% of cases. These results, in alignment with foundational studies such as the Swedish Obese Subjects (SOS) trial [9], are also in perfect accordance with the recent literature. Indeed, the randomized Oseberg trial confirmed the five-year superiority of the gastric bypass regarding both weight loss and T2DM remission (50% versus 20% for the sleeve, utilizing the strict criterion of an $HbA1c \leq 6.0\%$) [10]. The multicenter SleeveBypass trial further supports these precise conclusions [11]. The apparent moderation of our remission rates when juxtaposed with the figures from older meta-analyses (which occasionally exceeded 75% for T2DM) [12] simply reflects the application of substantially stricter criteria for disease resolution in contemporary medical practice.

Study Limitations and the Challenge of Long-Term Follow-Up

The major pitfall of this cohort resides in the growing proportion of patients lost to follow-up, surging from 12.8% at one year to nearly 65% at five years. This severe attrition constitutes the inherent Achilles' heel of obesity surgery, estimated at a national average of 30% [13]. A qualitative study (Hannoyer *et al.*) emphasizes that over half of patients disengage from follow-up protocols after a few years [14]. The incriminated factors include geographic distance, socioprofessional constraints, and most notably, the loss of the "chronic disease" perception among subjects who have recovered a satisfactory quality of life. To curb this phenomenon, the systematic integration of telemedicine tools and interactive patient portals has recently proven effective

in maintaining the therapeutic alliance and sustaining weight loss outcomes [15]. Furthermore, the pertinence of statistical comparisons between the two surgical techniques throughout the follow-up period is hindered by the initial numerical imbalance of our groups (141 SGs versus 22 RYGBs), a direct reflection of the first-line strategic choices in our center. These inherent limitations of our retrospective, single-center methodology underscore the importance of corroborating our observational findings with data from large, multicenter registries.

CONCLUSION

To date, bariatric surgery constitutes the most compelling therapeutic arsenal in the management of morbid obesity and its associated metabolic repercussions. Our study, analyzing 163 patients followed over a seven-year period, unequivocally demonstrates that these surgical interventions can be delivered within a regional hospital center with an optimal degree of safety and clinical cost-effectiveness. Bolstered by zero mortality, minimal early morbidity (1.84%), and sustained weight loss, the surgical experience at the Victor Jousselin Hospital in Dreux favorably rivals the standard metrics of hyper-specialized tertiary centers.

The complete remission of type 2 diabetes in over half of the operated patients reaffirms the metabolic vocation of these surgical procedures, with a proven long-term advantage associated with the Roux-en-Y gastric bypass. Nevertheless, the major attrition in follow-up at five years serves as a stark reminder that obesity intrinsically requires chronic, lifelong medical supervision. The future of this surgical discipline in peripheral community hospitals will necessarily rely on organizational innovation, notably through the deployment of telehealth services, to prevent patient disengagement. Finally, the excellent reproducibility of these clinical outcomes strongly advocates for the regulated popularization and expansion of bariatric surgery within other regional facilities equipped with adequate technical platforms.

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