



EVALUATING TRENDS AND OUTCOMES BETWEEN ROBOTIC AND LAPAROSCOPIC BARIATRIC SURGERY IN PATIENTS WITH BMI ≥60 KG/M²: AN MBSAQIP ANALYSIS OF 32,295 CASES

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INTRODUCTION

- Patients with BMI ≥60 kg/m² undergoing bariatric surgery represent a high-risk population, with increased technical complexity and perioperative challenges.
- Robotic-assisted bariatric surgery has been proposed to offer technical advantages, including improved dexterity, visualization, and ergonomics.
- However, comparative evidence between robotic and laparoscopic bariatric surgery (R-BS vs L-BS) in patients with BMI ≥60 kg/m² remains limited.
- This study aimed to evaluate trends, demographics, operative characteristics, and 30-day outcomes of robotic versus laparoscopic bariatric surgery in this high-BMI population.

METHODS AND PROCEDURES

- Retrospective analysis of the 2020–2023 MBSAQIP database.
- Patients with BMI ≥60 kg/m² undergoing primary laparoscopic or robotic SG or RYGB.
- Baseline demographics, operative characteristics, and 30-day postoperative outcomes.
- Multivariable logistic regression was performed to identify independent predictors of serious complications.

RESULTS

- A total of 32,295 patients met inclusion criteria; 22,211 (68.8%) underwent laparoscopic bariatric surgery (L-BS) and 10,084 (31.2%) underwent robotic bariatric surgery (R-BS).
- The R-BS group had slightly higher rates of gastroesophageal reflux disease (28.6% vs 26.1%, p<0.001) and hypertension (54.7% vs 52.8%, p=0.001).
- From 2020 to 2023, the proportion of R-BS increased from 20.4% to 41.3%, while L-BS declined from 79.6% to 58.7%.
- RYGB was more commonly performed using the robotic approach (27.4% vs 26.4%, p=0.059), and operative time was longer in R-BS (106.5 ± 51.4 vs 83.5 ± 47.0 min, p<0.001).
- Rates of leak, bleeding, reoperation, and readmission were low and comparable between R-BS and L-BS cohorts.
- Independent predictors included older age, hypertension, GERD, prior myocardial infarction, therapeutic anticoagulation, longer operative time, and RYGB. The robotic approach was not independently associated with serious complications.

Table. Predict risk factors for serious complications

	Adjusted odds ratio [*]	95% Confidence Interval	p-value
Higher BMI (per 5 kg/m ²)	1.01	1.00 - 1.02	0.135
Older age (per 10 years)	1.11	1.04 - 1.02	0.002
Longer operative time (per 30 mins)	1.11	1.07 - 1.15	< 0.001
Female	0.95	0.82 - 1.09	0.446
Diabetes			
Non-insulin dependent	0.95	0.81 - 1.11	0.507
Insulin dependent	1.08	0.86 - 1.36	0.504
Hypertension	1.60	1.38 - 1.86	< 0.001
GERD	1.26	1.10 - 1.44	0.001
Hyperlipidemia	1.06	0.90 - 1.25	0.493
History of myocardial infarction	1.85	1.20 - 2.86	0.005
Therapeutic anticoagulant	1.77	1.43 - 2.18	< 0.001
Robotic-assisted	0.99	0.87 - 1.14	0.940
RYGB	1.55	1.34 - 1.78	< 0.001

Abbreviations: BMI, body mass index; GERD, Gastroesophageal reflux disease

CONCLUSIONS

- In patients with BMI ≥60 kg/m² undergoing elective bariatric surgery, 30-day postoperative outcomes were comparable between laparoscopic and robotic approaches despite baseline differences between groups.
- Robotic procedures had longer operative times (approximately 27% longer) compared with laparoscopic surgery.
- The use of robotic bariatric surgery increased substantially, doubling between 2020 and 2023.
- Short-term safety appears comparable between approaches, and perioperative outcomes in this high-risk population are primarily driven by patient comorbidities and procedural factors rather than surgical approach.