

**SURGICAL WOUND INFECTION AFTER LAPAROSCOPIC BARIATRIC SURGERY: A RETROSPECTIVE STUDY AT KING HUSSEIN MEDICAL HOSPITAL**

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ABSTRACT

Background: Obesity is a global health crisis with increasing incidence worldwide. Traditional weight loss methods often yield inadequate long-term results. Bariatric surgery is recognized as the most effective intervention for morbid obesity, leading to a surge in demand. **Objective:** In this study, we aim to evaluate early postoperative outcomes, specifically the incidence of surgical wound infections (SWI), in patients undergoing laparoscopic bariatric surgery at King Hussein Medical Hospital, Jordan. **Methods:** A prospective, single-center study was conducted over three years (June 2021 to July 2024), involving 400 patients who underwent laparoscopic bariatric procedures. Data on demographic characteristics, comorbidities, and postoperative complications were collected and analyzed using descriptive statistics. **Results:** The mean age of patients was 44.0 years, with a mean preoperative BMI of 46.2 kg/m². Complications rates were low; SWI occurred in 0.5% of patients at 1-day and 0.8% at 2-weeks post-surgery. Common risk factors for SWI included high preoperative BMI and comorbidities such as hypertension and diabetes. **Conclusion:** Laparoscopic bariatric surgery demonstrates a low rate of early postoperative complications, indicating effective management of risks. Further multicenter studies are necessary to confirm these findings and explore long-term outcomes.

KEYWORDS: Bariatric surgery, surgical wound infection, laparoscopy, obesity.

INTRODUCTION

Obesity is a global health concern that causes life-threatening and disabling conditions, including diabetes mellitus and coronary artery disease. The conventional weight loss interventions, such as diet, exercise, and medications, often yield unsatisfactory long-term outcomes.^[1-3] Bariatric surgery has been shown to be the most effective treatment for morbid obesity. The demand for bariatric surgery has risen markedly, coinciding with an expected growth in the obese population.^[4,5]

Laparoscopic bariatric surgery has gained popularity due to its reduced risk of complications compared to open surgery, particularly in minimizing surgical wound infections (SWI).^[6,7] Among the most commonly performed bariatric procedures are laparoscopic sleeve gastrectomy and Roux-en-Y gastric bypass, both of which have demonstrated success in achieving significant weight loss and improving metabolic health outcomes.^[8,9]

However, despite the benefits, postoperative complications remain a concern in bariatric surgery. Complications such as SWI with elements of fever, and

discharge can affect recovery and long-term outcomes.^[10,11] Understanding the incidence and risk factors for these complications is critical for improving patient care and surgical success.^[12] Therefore, in this prospective, single-center study conducted at King Hussein Medical Hospital in Jordan aims to assess the early postoperative outcomes, particularly the incidence of SWI, in patients who underwent laparoscopic bariatric surgery, focusing on complications observed within the first two weeks post-surgery, and to investigate the risk factors associated with these complications.

METHODS

Study design: We carried out a prospective single-center study at King Hussein Medical Hospital in Jordan over three years between the period of June 2021 to July 2024 for patients who underwent laparoscopic bariatric surgery. All procedures were performed at King Hussein Medical Hospital by the same surgical team. The study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the Institutional Review Board at King Hussein Medical Hospital. Written informed consent was obtained from all participants involved in the study.

Data collection: Data was collected preoperatively for the following variables: age (years), sex, body-mass index (BMI), medical history of diabetes mellitus or hypertension, and current medications. Postoperative assessment was carried out at two time points, 1-day and 2-weeks post-surgery for the following information: postoperative fever, redness, discharge, and proven surgical wound infection.

Statistical analysis: Descriptive statistics were used to report the findings of our study using frequencies and percentages for categorical variables and mean with standard deviation (SD) for continuous variables. R statistical software v4.4.1 was used to carry out the analysis.

RESULTS

A total of 400 patients who underwent laparoscopic bariatric surgery were included in the study with a mean age at operation of 44.0 (8.0) years, and 208 (52%) were males (**Table 1**). Preoperative BMI was 46.2 (5.0) kg/m², 105 (26%) of patients had hypertension with 79 (20%) of patients taking anti-hypertensive medications, and 81 (20%) on diuretics. Diabetes mellitus was seen in 118 (30%) of patients and were on insulin treatment. Laparoscopic sleeve gastrectomy was performed in 266 (67%) of patients, while 134 (34%) underwent Roux-en-Y gastric bypass surgery.

Postoperative complications were observed at 1-day postoperatively, and 2-weeks postoperatively. Fever was in one patient (0.3%) at 1-day postoperatively, and in two patients (0.5%) at 2-weeks postoperatively. While discharge and SWI were observed in two patients (0.5%) at 1-day postoperatively, and in 3 (0.8%) patients at 2-weeks postoperatively. No patient showed redness at 1-day postoperatively, while one patient (0.3%) had redness at 2-weeks postoperatively (**Table 1**).

The patients who had SWI at 1-day and 2-weeks postoperatively are presented in **Table 2**. Those who had SWI at 1-day postoperatively had a mean age of 38.55 (3.75) years and were both females with a mean preoperative BMI of 54.25 (0.07) kg/m². Both patients had hypertension and diabetes mellitus and were on insulin and anti-hypertensive treatment. One patient underwent laparoscopic sleeve gastrectomy, and another had Roux-en-Y gastric bypass surgery. One of them had fever at 1-day and 2-weeks postoperatively, and both of them had discharge at 1-day and 2-weeks postoperatively. Another male patient had SWI at 2-weeks postoperatively who underwent Roux-en-Y gastric bypass surgery, with postoperative redness at 2-weeks (**Table 2**).

Table 1: Characteristics of patients who underwent bariatric surgery.

CHARACTERISTIC	N = 400
AGE (YEARS), MEAN (SD)	44 (8)
SEX, N (%)	
FEMALE	192 (48%)
MALE	208 (52%)
PREOPERATIVE BMI (KG/M ²), MEAN (SD)	46.2 (5.0)
HTN, N (%)	105 (26%)
DM, N (%)	118 (30%)
MEDICATIONS, N (%)	
ANTI-HTN	79 (20%)
DIURETIC	81 (20%)
INSULIN	118 (30%)
NONE	82 (21%)
SUPPLEMENTS	40 (10%)
TYPE OF SURGERY, N (%)	
LSG	266 (67%)
RYGB	134 (34%)
1-DAY POSTOPERATIVE FEVER, N (%)	1 (0.3%)
1-DAY POSTOPERATIVE DISCHARGE, N (%)	2 (0.5%)
1-DAY POSTOPERATIVE REDNESS, N (%)	0 (0%)
1-DAY POSTOPERATIVE SWI, N (%)	2 (0.5%)
2-WEEKS POSTOPERATIVE FEVER, N (%)	2 (0.5%)
2-WEEKS POSTOPERATIVE DISCHARGE, N (%)	3 (0.8%)
2-WEEKS POSTOPERATIVE REDNESS, N (%)	1 (0.3%)
2-WEEKS POSTOPERATIVE SWI, N (%)	3 (0.8%)

Abbreviations: BMI, body mass index; HTN, hypertension; DM, diabetes mellitus; LSG, laparoscopic sleeve gastrectomy; RYGB, Roux-en-Y gastric bypass; SWI, surgical wound infection.

Table 2: Patients with SWI at 1-day and 2-weeks postoperatively.

CHARACTERISTICS	SWI AT 1-DAY, N = 2	SWI AT 2-WEEKS, N = 3
AGE (YEARS), MEAN (SD)	38.55 (3.75)	44.6 (10.8)
SEX, N (%)		
FEMALE	2 (100%)	2 (67%)
MALE		1 (33%)
PREOPERATIVE BMI (KG/M ²), MEAN (SD)	54.25 (0.07)	54.23 (0.06)
HTN, N (%)	2 (100%)	3 (100%)
DM, N (%)	2 (100%)	2 (67%)
MEDICATIONS, N (%)		
INSULIN	2 (100%)	1 (33%)
ANTI-HTN	2 (100%)	2 (67%)
TYPE OF SURGERY, N (%)		
LSG	1 (50%)	1 (33%)
RYGB	1 (50%)	2 (67%)
1-DAY POSTOPERATIVE FEVER, N (%)	1 (50%)	1 (33%)
1-DAY POSTOPERATIVE DISCHARGE, N (%)	2 (100%)	2 (67%)
1-DAY POSTOPERATIVE REDNESS, N (%)	0 (0%)	0 (0%)
2-WEEKS POSTOPERATIVE FEVER, N (%)	1 (50%)	2 (67%)
2-WEEKS POSTOPERATIVE DISCHARGE, N (%)	2 (100%)	2 (67%)
2-WEEKS POSTOPERATIVE REDNESS, N (%)	0 (0%)	1 (33%)

Abbreviations: BMI, body mass index; HTN, hypertension; DM, diabetes mellitus; LSG, laparoscopic sleeve gastrectomy; RYGB, Roux-en-Y gastric bypass; SWI, surgical wound infection.

DISCUSSION

Bariatric surgery is recognized as the most effective treatment for morbid obesity, with a notable increase in demand due to increasing obesity rates. Laparoscopic bariatric surgery is associated with lower complication rates compared to open surgery.^[13,14] However, postoperative complications, such as SWI, fever, and discharge rates in Jordanian population are unclear and are vital in monitoring recovery and long-term success. In this prospective study, we aimed to evaluate early postoperative outcomes, focusing on SWI incidence and related risk factors within the first two weeks after laparoscopic bariatric surgery.

In this study we included 400 patients who underwent laparoscopic bariatric surgery, with high preoperative BMI at 46.2 kg/m² suggesting morbid obesity. The majority of patients had laparoscopic sleeve gastrectomy (67%), while Roux-en-Y gastric bypass was performed in 34% of patients.

Postoperative complications were very minimal and were observed at 1 day and 2 weeks post-surgery. Only one patient experienced fever at 1 day postoperatively, and increasing to two patients at 2 weeks. The rate of SWI was 0.5% at 1 day and 0.8% at 2 weeks, demonstrating that most patients recovered well with low rates of infection or fever. The rate of SWI in previous studies reached 2.2% in Kushner et al. study^[15], and 1% in Ferraz et al. study.^[16] A detailed look at patients who developed SWI revealed that these patients shared common risk factors, including high preoperative BMI and comorbidities such as hypertension and diabetes. In line with our findings, Ferraz et al. also showed that patients with higher BMI, had a significantly higher rate

of postoperative SWI^[16] In a study by Giarola et al. investigating the risk factors associated with postoperative SWI showed that the risk rate of SWI was 0.9% and mortality rate in patients without SWI was only 0.03% while it was significantly higher at 4% in those with SWI, with a significantly higher relative risk of 112.^[17]

Additionally, two patients with early SWI were female and had a particularly elevated BMI (mean 54.25 kg/m²), suggesting that elevated BMI and pre-existing comorbidities may be important risk factors for postoperative complications in bariatric surgery patients.^[18,19] Additionally, both types of surgery (sleeve gastrectomy and Roux-en-Y gastric bypass) were associated with these complications. However, open surgery has been shown to be associated with greater risk of postoperative SWI infection compared to open surgery. In a meta-analysis of 44 studies by Shabanzadeh et al. showed that laparoscopic surgery in obese patients reduces the rate of surgical site infections by 70%–80% compared to open surgery in general abdominal procedures.^[20]

Our study has several strengths. First, it was conducted over a three-year period with a substantial sample size of 400 patients, ensuring that the findings are more representative of real-world outcomes in laparoscopic bariatric surgery. The prospective design allows for systematic and consistent data collection, minimizing recall bias. All procedures were performed by the same surgical team, ensuring uniformity in surgical technique and reducing variability in postoperative outcomes. Additionally, the study provides detailed follow-up at two key time points—1-day and 2-weeks

postoperatively—allowing for early detection of complications such as fever, SWI, and discharge. However, there are a few limitations to consider. First, the single-center nature of the study may reduce the generalizability of the results, as practices and outcomes at other institutions could differ. Second, our study focuses primarily on immediate postoperative events, with no comprehensive data on the impact of preoperative comorbidities (e.g., hypertension, diabetes) on long-term recovery and surgical success. Future studies are needed to include multicenter studies to validate these findings across diverse healthcare settings and surgical teams. Incorporating long-term follow-up data on patient outcomes, such as weight loss, resolution of comorbidities, and quality of life, would provide a more holistic understanding of the effects of bariatric surgery. Additionally, studies examining the role of different bariatric procedures, particularly comparing outcomes between sleeve gastrectomy and Roux-en-Y gastric bypass, could further guide surgical decision-making.

Our findings showed valuable insights into the early postoperative outcomes of laparoscopic bariatric surgery, identifying low rates of complications such as fever, SWI, and discharge. These findings suggest that early postoperative complications are relatively rare and can be effectively managed. However, the study's limitations, including its single-center design and lack of long-term data, warrant further research. Future multicenter, long-term studies are essential to assess the broader implications of these procedures on patient health and recovery.

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