

Perioperative complications in obese women vs normal-weight women who undergo vaginal surgery

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OBJECTIVE: The purpose of this study was to compare the incidence of perioperative complications in obese and normal-weight patients who undergo vaginal urogynecologic surgery.

STUDY DESIGN: A retrospective cohort analysis was conducted for obese patients (body mass index, ≥ 30 kg/m²) who underwent vaginal surgery and who were matched with patients with normal body mass indices (> 18.5 kg/m² but < 30 kg/m²) by surgical procedures. Demographic information, comorbidities, and perioperative (≤ 6 weeks) complications were documented. Logistic regression analysis was used to compare the incidence of perioperative complications and to adjust for baseline differences.

RESULTS: Seven hundred forty-two patients underwent vaginal surgery during the study period; 235 women were considered to have

obese body mass indices. We matched 194 of these patients with normal-weight control subjects. There was no statistical difference in the proportion of subjects who had at least 1 perioperative complication (20% [obese] vs 15% [nonobese]). However, obese subjects were more likely to have an operative site infection (adjusted odds ratio, 5.5; [95% CI, 1.7-24.7]; $P = .01$).

CONCLUSION: The overall perioperative complication rate in obese and nonobese women is low, with obesity as an independent risk factor for the development of operative site infections.

Key words: obesity, perioperative complication, vaginal surgery

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The prevalence of obesity in all industrialized nations is increasing.¹ Specifically, in the United States, approximately two-thirds of the population is overweight (body mass index [BMI] ≥ 25), with almost one-third of this population reaching obesity (BMI, ≥ 30 kg/m²).² The increase in the prevalence of obesity is associated with an increase in the prevalence of comorbidities, such as hypertension, type 2 diabetes mellitus, heart disease, stroke, obstructive sleep apnea, asthma, weight-bearing musculoskeletal degenerative impairments, depression, and certain forms of cancer.^{3,4}

Increased BMI is also associated with increased prevalence of stress urinary incontinence^{5,6} and increased severity of incontinence.⁷⁻⁹ Although the relationship between obesity and pelvic organ prolapse is not as clear,^{10,11} in the study by Olsen et al¹² on the epidemiology of surgery for prolapse and urinary incontinence, 23% and 34% of patients who underwent surgery for prolapse alone and prolapse and incontinence, respectively, were obese.

In light of the association between obese patients and increased comorbidities and mortality, obese patients have long been considered to be at increased risk for perioperative and postoperative complications.¹³⁻¹⁵ It has been shown that the incidence of operative site infections after abdominal general surgery and benign gynecologic and obstetric procedures is significantly higher in obese patients.¹⁶⁻¹⁸ However, recent studies demonstrated that obese women who undergo vaginal hysterectomy sustain fewer perioperative complications than after abdominal hysterectomies.¹⁹ Additionally, vaginal hysterectomy complication rates were not significantly dif-

ferent between obese and nonobese patients.²⁰ Therefore, it would follow logically that obese patients may benefit from vaginal surgeries that bypass the abdominal route. However, it is unclear whether the aforementioned findings can be applied toward other vaginal surgeries that include incontinence and prolapse procedures. The aim of this study was to compare the incidence of perioperative complications in obese and morbidly obese patients undergoing vaginal urogynecologic surgery with normal-weight patients.

MATERIALS AND METHODS

After approval from the Cleveland Clinic Institutional Review Board, a cohort of all obese patients (defined as BMI ≥ 30 kg/m² according to the National Heart, Lung, and Blood Institute²¹) who underwent vaginal surgery between January 2003 and June 2005 was identified from the operating room schedulers' database. Patients were included if 1 of the 3 staff urogynecologic surgeons, either as primary or secondary surgeon, performed the procedures during the study period. A resident and/or fellow partici-

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pated in all the procedures. Exclusion criteria included vaginal hysterectomies or routine gynecologic procedures without concomitant prolapse or incontinence surgery, office-based cases, planned combined abdominal and vaginal procedures, planned combined vaginal and laparoscopic cases, and surgeries for malignancies or suspected malignancies. A cohort of normal-weight control subjects (BMI, >18.5 kg/m² but <30 kg/m²) were obtained by matching for surgical procedures. Obese and normal-weight control subjects were matched with the use of the Current Procedural Technology codes of the procedures performed. If >1 procedure was performed, the Current Procedural Technology codes of the first 3 major procedures were considered. If >1 normal-weight control subject matched an obese subject, the matched control subject was assigned randomly with a computer-generated random number program.

A hospital-wide computer-based electronic records system that documents all dictated operative and discharge summaries, laboratory and imaging studies, emergency room visits, clinical visits, and postoperative telephone conversations was used for data extraction that related to complications. Inpatient medical records were also reviewed. Data that were recorded included demographic characteristics, comorbid conditions, and American Society of Anesthesiologists Physical Status (ASA) classifications. A Charlson Comorbidity Index (CCI) score²² was calculated for each patient by giving each comorbidity a weighted point score and then adding up all the points to arrive at an index score. The ASA classifications and CCI scores were used to summarize the patients' overall perioperative risks. Perioperative death rate (within 6 weeks) and death rate within 1 year were determined by chart review and review of the Social Security Death Index.

Intraoperative complications included injury to structures such as nerves, bowel, bladder or ureter; the need for intraoperative blood transfusion; the need for conversion to laparotomy; and anesthesia-related events. Significant postoperative complications comprised of events such as

TABLE 1

Complications with definitions

Postoperative complication	Definition
Major	
Pulmonary edema	Increased vascularity on chest radiograph that responded to diuretics and signs and symptoms of fluid overload
Pulmonary embolism*	
Prolonged oxygen requirement	Unexpected need for home supplemental oxygen that was unexplained by pulmonary embolism or edema
Pneumonia*	
Congestive heart failure	Echocardiographic findings and/or clinical signs or symptoms that prompted a cardiology consult, with the subsequent diagnosis of heart failure
Myocardial infarction*	
Arrhythmia*	
Operative site infection*	
Incisional cellulitis	Induration without purulent fluid collection with fever and/or leukocytosis and/or pain
Pelvic cellulitis	Radiologic findings of nonspecific soft-tissue stranding without localized fluid collection, with fever and/or leukocytosis and/or pain
Incisional abscess	Discrete collection of subcutaneous purulent fluid plus fever and/or leukocytosis and/or pain
Pelvic abscess/hematoma/seroma [†]	Discrete intraperitoneal pelvic collection of fluid plus fever and/or leukocytosis and/or pain
Sepsis*	
Significant bleeding complications	Hematocrit level < 24% or blood transfusion
Small bowel obstruction*	
Renal failure*	
Minor	
Fever of unclear cause	Temperature >38°C for >24 hours after surgery that occurred on at least 2 occasions (4 hours apart) without an obvious source of infection on clinical, laboratory, or radiologic evaluation and that resolved spontaneously without treatment
Ileus*	
Urinary tract infection	Positive urine culture or treatment with antibiotics for suspicious urinalysis with or without culture confirmation

* Standard definitions were not listed.

[†] Although it is often difficult to distinguish abscess from hematoma or seroma clinically and radiologically, exceptions were made if the confirmation of an abscess or hematoma/seroma could be made on drainage of fluid collection or on clinical grounds, such as the need for blood products without the need for antibiotics.

pulmonary edema, pulmonary embolism, prolonged oxygen requirement, pneumonia, congestive heart failure, myocardial infarction, arrhythmia, infections near or at the operative sites, sepsis, small-bowel obstruction, and renal failure (Table 1).

Postoperative complications that occurred >6 weeks from surgery, except for 1-year mortality rate, were not assessed in this study.

Results are presented as mean with SD for continuous parametric data, median

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