Gynecologic Surgery in the Obese Woman

ABSTRACT: Obesity is a serious problem worldwide and particularly in the United States, and in women is associated with an increased risk of death and morbid conditions (including hypertension, diabetes mellitus, obstructive sleep apnea, and hypercholesterolemia) as well as malignancies such as endometrial and postmenopausal breast cancer. Adverse effects after gynecologic surgery, such as surgical site infection, venous thromboembolism, and wound complications, are more prevalent in obese women than in normal-weight women. Preoperative consultation with an anesthesiologist should be considered for the obese patient in whom the possibility of obstructive sleep apnea is suspected on clinical grounds or who is at risk of coronary artery disease, has a difficult airway, or has poorly controlled hypertension. Gynecologic surgeons should have the knowledge to counsel obese women on the risks specific to this group. As with all patients, evidence demonstrates that, in general, vaginal hysterectomy is associated with better outcomes and fewer complications than laparoscopic or abdominal hysterectomy. Postoperative care of the obese patient is similar to postoperative care of the normal-weight patient and comorbid conditions should be taken into consideration.

Based on expert opinion and available data, the American College of Obstetricians and Gynecologists makes the following recommendations:

- Gynecologic surgeons should have the knowledge to counsel obese women on the risks specific to this group.
- As with all patients, evidence demonstrates that, in general, vaginal hysterectomy is associated with better outcomes and fewer complications than laparoscopic or abdominal hysterectomy.

Obesity is a serious problem worldwide and particularly in the United States, and in women is associated with an increased risk of death and morbid conditions (including hypertension, diabetes mellitus (DM), obstructive sleep apnea, and hypercholesterolemia) as well as malignancies such as endometrial and postmenopausal breast cancer. Obesity is defined as having a body mass index (BMI [calculated as weight in kilograms divided by height in meters squared]) of 30 or greater (1), and it can be further subdivided: class I obesity is defined as a BMI of 30 to less than 35; class II obesity is defined as a BMI of 35 to less than 40; and class III obesity is defined as a BMI of 40 or greater (2, 3). Obese individuals also are often the target of discrimination solely because of their weight and appearance (4). Weight management remains a challenge for physicians and patients (5). Clinicians may counsel patients about weight loss before surgery, although weight loss should not restrict access to indicated surgery. The purpose of this Committee Opinion is to provide guidance for gynecologic surgeons in the preoperative assessment and intraoperative and postoperative management of the obese patient undergoing gynecologic surgery.

Risks for Obese Women Undergoing Surgery

Overall mortality and composite morbidity in the obese patient without metabolic complications undergoing general surgery actually has been shown to be lower than that of normal-weight patients in a phenomenon referred to as the “obesity paradox” (6). A prospective, multiinstitutional, risk-adjusted cohort study of 118,707 patients who underwent nonbariatric general surgery examined mortality risk and found the highest rates in the underweight and morbidly obese extremes and the lowest rates...
in the overweight and moderately obese (6). The paradox may be attributable to subsets of obese patients with meaningful differences; those patients who are metabolically healthy but obese, and another group who are obese with metabolic syndrome (obesity, hypertension, and diabetes) (7). Obese patients with metabolic syndrome (specifically, hypertension and diabetes) who undergo general, vascular, and orthopedic surgery are at increased risk of perioperative morbidity and mortality compared with normal-weight patients (7).

Wound complications, surgical site infections, and venous thromboembolism remain a major source of morbidity for obese patients undergoing abdominal surgery. As the BMI increases for women undergoing abdominal hysterectomy, so does the risk of surgical site infections (8) and wound complication (9). In a prospective cohort that included more than 1.3 million women, the risk of venous thromboembolism increased with increased BMI and was greater for those who underwent surgery compared with those who did not (10). Every effort should be made to offer all patients, regardless of BMI, the least invasive procedure in order to decrease complications, length of hospital stay, and postoperative recovery time. As with all patients, evidence demonstrates that, in general, vaginal hysterectomy is associated with better outcomes and fewer complications than laparoscopic or abdominal hysterectomy (11). In patients who are not good candidates for vaginal surgery, the laparoscopic approach offers an alternative that may decrease blood loss and length of hospital stay at the time of hysterectomy. In a Cochrane review of studies on hysterectomy, the risk of wound complication and surgical site infections is less when the procedure is done through a vaginal or laparoscopic approach compared with an open route (12). Laparoscopy can be more complicated in the obese patient, and the risk of conversion to laparotomy is higher, but the conversion rate tends to decrease over time with surgical experience (13). Quality of life data for patients of all weights, 4 years after hysterectomy, also support the use of laparoscopy over laparotomy (14). Gynecologic surgeons should have the knowledge to counsel obese women on the risks specific to this group.

**Preoperative Counseling**

Counseling for the obese woman scheduled for gynecologic surgery should be individualized and take into consideration specific risk factors and indication for surgery. The possibility of conversion to an open procedure should be discussed in preoperative counseling and individualized based on the surgeon’s experience. Because of the increased risk of wound complications, surgical site infections, and venous thromboembolism in the obese patient, a less invasive management approach, including alternatives to surgery or a less invasive procedure, should be considered. Figure 1 demonstrates a nomogram that may assist the gynecologic surgeon in preoperative counseling of obese women.

**Preoperative Evaluation and Preparation**

Before undertaking gynecologic surgery, an evaluation of underlying comorbid conditions that could affect intraoperative and postoperative care should be performed. Obese patients are at higher risk of coronary artery disease (CAD), hypertension, DM, obstructive sleep apnea, and venous thromboembolism. Preoperative consultation with an anesthesiologist should be considered for the obese patient in whom the possibility of obstructive sleep apnea is suspected on clinical grounds or who is at risk of CAD, has a difficult airway, or has poorly controlled hypertension. The oral airway in an obese patient is suboptimal because of decreased neck mobility and narrowing of the pharyngeal space due to the presence of increased soft tissue. There are no specific preoperative ancillary tests recommended for the obese patient. Tests should be ordered only if an abnormal outcome will change clinical management. Obese patients with metabolic syndrome undergoing noncardiac surgery are at increased risk of cardiovascular complications; thus, those with other risk factors for CAD may benefit from a 12-lead electrocardiogram and other tests based on physical examination findings. In obese patients with DM, blood glucose evaluation and counseling the woman on the importance of euglycemia to improve postoperative wound healing is important. Routine screening of the obese patient for diabetes before surgery is not recommended.

Obstructive sleep apnea can be associated with postoperative respiratory complications (pneumonia, postoperative hypoxemia, and unplanned reintubation), but it is unknown whether screening for obstructive sleep apnea improves postoperative outcomes (15). Routine pulmonary function tests on the obese patient are not recommended.

Preoperatively, the office abdominal and bimanual pelvic examination to guide the route of surgery may be difficult in obese patients. Preoperative imaging (e.g., magnetic resonance imaging) may help to determine the best route of surgery in these cases, and an examination under anesthesia may provide more guidance.

**Intraoperative Issues**

Surgical centers, hospitals, and practices may have their own guidelines on how to treat obese and morbidly obese patients. Obese patients undergoing gynecologic surgery longer than 45 minutes, and not at risk of major bleeding, fall into the category of moderate risk of venous thromboembolism and should receive prophylaxis in the form of low molecular weight heparin, low-dose unfractionated heparin, or mechanical prophylaxis with intermittent pneumatic compression (16).

A recent investigation of maternal obesity in cesarean delivery has highlighted a decreased antibiotic tissue concentration in the obese patient using current prophylactic antibiotic recommendations; this may account...
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for the increased surgical site infection rate in obese patients (17). When prophylactic antibiotics are warranted, some have advocated a 2-g prophylactic cefazolin dose in those patients who weigh more than 80 kg, with an increase to 3 g for those who weigh more than 120 kg (18).

Surgical patient positioning is important to maximize exposure and reduce the risk of injury. The operating table should accommodate the size and weight of the patient or two tables joined together may be required. Operating tables typically accommodate 205 kg, although some tables can accommodate 455 kg. The set-up should allow the surgeon adequate maneuverability during the surgery, provide protection on patient pressure areas to avoid neural injuries and pressure sores, and ensure availability of secure belts and gel pads to prevent movement of the patient on the table. Lithotomy position typically requires the use of knee-crutch, candy cane-shaped, or boot-type stirrups. The candy cane-shaped stirrup allows more operating space, but they may lead to extreme knee and hip abduction in obese patients. The boot-type stirrup allows better lower extremity alignment and safety, but there is less maneuverability and decreased surgical site access. Most stirrups can accommodate a patient weight of 500 lb (227 kg), although some boot-type stirrups used for bariatric surgery will sustain up to 780 lb (354 kg). The choice of stirrup should safely accommodate the patient’s weight while avoiding pressure on points that could lead to nerve injury.

Abdominal surgery in the obese patient may be challenging. As the amount of subcutaneous tissue increases, retraction and adequate exposure is difficult. Compared with abdominal surgery in normal-weight women, abdominal hysterectomy has been associated with longer operative times in obese women (19). Additionally, multiple kits may be necessary for abdominal skin preparation.

Laparoscopy in the obese patient is more technically challenging than in the normal-weight patient and should be undertaken by those who have adequate laparoscopic surgical experience. Given the increase in size of the anterior abdominal wall, if the Veress needle is used, the 150 mm length may help achieve pneumoperitoneum and avoid preperitoneal insufflation; longer ancillary trocars (up to 150 mm) also may be useful. Placement of ancillary trocars can be more challenging because of the suboptimal visualization of the inferior epigastric vessels. Exposure can be difficult when operating in the pelvis of an obese patient. Operating in the pelvis requires

![Nomogram predicting post-operative wound complications. The study defined normal-weight patients as a body mass index (calculated as weight in kilograms divided by height in meters squared) of 8.5–24.9 and morbid obesity as 40–49. (Reprinted from Gynecologic Oncology, Vol. 121, Elizabeth K. Nugent, John T. Hoff, Feng Gao, L. Stewart Massad, Ashley Case, Isreal Zighelboim, David G. Mutch, Premal H. Thaker, Wound complications after gynecologic cancer surgery, 347–52, 2011, with permission from Elsevier.)](image)
the Trendelenburg position, which may cause difficulty in ventilating the patient. A higher pneumoperitoneal pressure may be required, but the higher pressure may hamper the ability to provide adequate ventilation. The omental fat and limited manipulation of instruments also pose difficulty. Closure of any port size at least 10 mm or greater often presents the greatest challenge; a port closure technique that affords laparoscopic visualization may be useful in this situation. Although vaginal surgery is the preferred method of operation, it also can be challenging. The size of the patient’s legs and buttocks, and redundant vaginal sidewalls can make visualization difficult; Breisky–Navratil vaginal retractors are helpful.

**Postoperative Issues**

Postoperative care of the obese patient is similar to postoperative care of the normal-weight patient and comorbid conditions should be taken into consideration. Ancillary personnel should be aware of the importance of continued prophylactic measures to decrease the possibility of venous thromboembolism until the woman is fully ambulatory. Patients who are not fully ambulatory before surgery may benefit from extended venous thromboembolism prophylaxis, although data are limited. More data are needed to outline a specific recommendation in this situation. Many obese patients have degenerative joint disease, so early ambulation may prove challenging.

Respiratory morbidity is more common in the obese patient. Postoperative hypoxemia, which is experienced more frequently in the obese patient, can be addressed with the use of aggressive incentive spirometry or continuous positive airway pressure (20). In order to maintain respiratory drive, conservative use of postoperative opioids is recommended. A multimodal approach to the use of postoperative pain medicine allows for a decrease in postoperative opioid use. Nonsteroidal antiinflammatory drugs administered preoperatively or intraoperatively appear to be more effective than acetaminophen in reducing nausea and vomiting and total postoperative opioid use (21). Regional anesthesia also may be an option to decrease the total opioid amount required for postoperative analgesia, or to avoid intubation altogether for minor surgical cases. In patients with concomitant obstructive sleep apnea, the American Society of Anesthesiologists recommends that before discharge, the patient should be able to adequately maintain oxygen saturation on room air, without stimulation while asleep (22). Wound complications and surgical site infections continue to remain the most common postoperative complication in obese patients who undergo abdominal hysterectomy (19). Although data are limited, postoperative wound complications may be lessened in the obese patient after abdominal hysterectomy with subcutaneous suture placement, t alc application, or wound vacuums (23). Glycemic control in diabetic patients may improve postoperative wound healing.

**Conclusions and Recommendations**

Obese patients commonly have comorbid conditions (eg, obstructive sleep apnea, CAD, poorly controlled hypertension, or a difficult airway) that can complicate intraoperative and postoperative care. Obese patients with metabolic syndrome have higher perioperative morbidity and mortality than normal-weight patients. Adverse effects after gynecologic surgery such as surgical site infection (with a BMI greater than 35) (8), venous thromboembolism (with a BMI equal to or greater than 35) (10), and wound complications (10 times more likely with a BMI of 40–49 compared with normal-weight patients) (9) are more prevalent in obese women than in normal-weight women. Preoperative consultation with an anesthesiologist should be considered for the obese patient in whom the possibility of obstructive sleep apnea is suspected on clinical grounds or who is at risk of CAD, has a difficult airway, or has poorly controlled hypertension.

**References**


22. Practice guidelines for the perioperative management of patients with obstructive sleep apnea: an updated report by the American Society of Anesthesiologists Task Force on Perioperative Management of Patients with Obstructive Sleep Apnea. Anesthesiology 2014;120:268–86. [PubMed] [Full Text]