

Intraoperative Positioning and Care of the Obese Patient

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The perioperative nurse involved in the intraoperative care of the obese patient is faced with numerous issues and challenges. As a growing number of these patients present for medical care, the nurse must consider the special positioning needs for surgery and the equipment needed to promote the safest environment for the patient. This article addresses positioning considerations for the obese patient and special equipment needs and selection in the operating room.

Statistics from the National Center for Health Statistics of the Centers for Disease Control and Prevention indicate that more than 60% of adults in the United States are overweight, and 20% are morbidly obese (National Task Force on the Presentation and Treatment of Obesity, 2002). With obesity having doubled in 20 years, the number of morbidly obese individuals also on the rise, and new data showing that the number of children who are overweight (defined as body mass index-for-age at or above the 95th percentile on Centers for Disease Control growth charts) continues to increase, it is no wonder that surgical nurses are seeing more overweight patients now than ever seen previously. This patient population presents the nurse with many new issues and challenges in the perioperative setting.

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More than 300,000 deaths annually can be attributed to obesity (The American College of Surgeons Committee, 2000). Healthcare expenditures related to this problem total 6% or approximately \$238 billion per year nationally. With increased technology and the advent of bariatric weight loss procedures, obesity-related costs have risen tremendously.

A survey by Novation, a group-purchasing organization for hospitals and healthcare institutions, found that hospitals are seeing more obese patients today than ever seen previously (Lucido, 2003). Some hospitals estimate that additional costs associated with treating or accommodating the severely obese can reach up to \$500,000 per year per institution. Hospitals around the country must buy specialized equipment such as larger beds, large wheelchairs, blood pressure cuffs, toilets, walkers, and so forth, and in some cases, even remodel their facilities to cope with the ever-increasing number of obese patients presenting for care, according to the survey of hospital-purchasing executives (Lucido, 2003).

The nurse must use all of his or her acquired skills for assessing the patient and must work with the surgical team in developing a plan of care that will promote safety and positive outcomes for the obese surgical patient. A step-by-step approach to this process follows.

PREOPERATIVE CARE

Perform a complete and thorough patient assessment, which provides necessary information for the appropriate planning for the intraoperative phase.

Be aware of comorbidities that put the patient at a greater risk for complications, including the following:

- Diabetes
- Hypertension
- Hyperlipidemia
- Cardiac disease
- Sleep apnea
- Osteoarthritis
- Heartburn (ie, gastroesophageal reflux disease)
- Depression
- Stress incontinence
- Menstrual irregularity

Review the patient's laboratory findings. Liver disease is not uncommon owing to infiltration of fat into the liver, a finding that increases noticeably when tied in with a positive glucose intolerance. Understand that liver function tests may not actually indicate the true severity of any liver disease present.

Review electrocardiogram results. Common changes include

- Increased heart rate
- Increase or decrease in QRS voltage (from a large, fatty chest or hypothyroidism)
- Slowed conduction
- Signs of ischemia or myocardial infarction

Check the patient's history for recent weight gain or loss, diet, use of appetite suppressants, and gastric surgery. Allow enough preparation time before the start of surgery for team planning. Thorough attention to preoperative patient care assists in evaluating proper set up of the operating suite.

EQUIPMENT SELECTION IN THE OPERATING ROOM

Evaluate and select the appropriate positioning equipment prior to the patient entering the operating room (OR). Most OR tables can safely support a 500-lb patient and still be used for their special functions. Many OR table manufacturers have addressed the issue of the larger patient by producing heavy-duty OR tables capable of lifting and supporting patients weighing 800 to 1000 lb. Obese patients are at an increased risk for falling off the OR table because of instability and weight load shifts. These newer tables have side extensions for added support for very wide patients (Figures 1 and 2).

For facilities using older tables without these accessories, the addition of extra arm boards to the lower end of the table allows for additional support to lower extremities. Always follow the manufacturer's recommendations for the use of OR tables and attachments.

Adequate padding is essential for the obese patient. The extra weight of the patient puts additional pressure on the areas that come in contact with the OR table or the positioning devices used.



Figure 1. Skytron 6600B operating table capable of lifting 1000 pounds. (Courtesy of Skytron, Grand Rapids, MI.)

The Association of periOperative Registered Nurses recommends that padding and positioning devices maintain a normal capillary interface pressure of 32 mm Hg or less, thereby reducing the risk of OR-acquired pressure ulcers (Association of periOperative Registered Nurses, 2004). Pads and bolsters made of viscoelastic polymers, such as Akton, reduce pressure and provide adequate support for the desired position (Figure 3). Foam products tend to be ineffective because they may be compressed and “bottom out,” providing no relief of pressure and little or no support, especially in heavy patients.

Appropriate instrumentation, such as larger retractors, long staplers, and long instruments, must be available. Proper planning and corroboration among the nurse, surgeon, and anesthesiologist help prevent delays in procedures and address potential problems before they occur.



Figure 2. A variety of accessories are available to aid in supporting and positioning the patient. (Courtesy of Skytron, Grand Rapids, MI.)

INTRAOPERATIVE CARE

With all of the preassessments completed, there is still a chance that the patient will experience problems in the OR. Some of the issues that the nurse must be aware of follow.

Airway Management

Difficult intubation is relatively more common in the obese patient, and it is extremely important to formulate an airway management plan with the anesthesiologist. Assist him or her with induction of general anesthesia or placement of epidural and spinal anesthetics.

During intubation, the weight of the head increases exertion during laryngoscopy. A “bull neck” (short, thick neck) inhibits mobility and makes visualization of the larynx difficult during laryngoscopy. Head tilt may require the use of blankets or sheets under the back, scapulae, shoulders, and the head and neck to provide sufficient “lift” for visualization. Large breasts may get in the way of the laryngoscope handle. It may be necessary to insert the laryngoscope blade separately into the mouth and then hook it to the laryngoscope handle.

Obese patients desaturate oxygen rapidly because of decreased functional reserve capacity, the weight of the viscera on the diaphragm, compliance changes, and the extra weight of the chest wall to elevate with accessory muscles of respiration. Respiratory distress may necessitate “awake” intubation in the sitting position. Always be prepared for emergency cricothyrotomy or tracheostomy.

Blood Pressure Measurement

Be sure to use an appropriately sized blood pressure cuff. Many times a “thigh” cuff is used on the arm. A selection of oversized cuffs is recommended. Some patients may be considered for an arterial pressure monitoring line placement.

Foley Catheters

A massive abdomen in either sex may require retraction by tape or assistants to visualize the perineum. In very large women, a catheter is sometimes placed more easily with the patient in a lateral position, with the upper leg flexed or lifted by a helper.

Intravenous Access

The excessive subcutaneous fat of the obese patient makes it harder to locate deeper veins. An ordinary rubber tourniquet usually tends to be ineffective. Use of an appropriately sized blood pressure cuff as a tourniquet may help distend the veins better. Central lines in the neck may not be feasible, because



Figure 3. Assorted viscoelastic polymer positioning devices. (Courtesy of Action Products, Hagerstown, MD.)

these patients typically have short, thick necks. Femoral vein central access is complicated by difficulties in identifying landmarks and the necessity of having to retract the abdomen from the femoral area to provide access.

POSITIONING THE PATIENT

Body Mechanics

The safe transfer of the patient to the OR table and subsequent positioning must be performed with an adequate number of personnel and equipment. A sufficient number of staff members provides safety for both the patient and the staff. Using good body mechanics is crucial. Most back injuries to staff are the result of failing to summon enough help. Always be sure that you have sufficient assistance staff.

The supine patient finds respirations difficult and may need to have the back elevated. Abdominal weight can compress the inferior vena cava and the aorta, impeding normal blood flow. The Trendelenburg position exacerbates this condition and may lead to fatality due to cardiorespiratory decompensation.

The prone position is not well tolerated by the overweight patient. Compression on the abdomen may constrict the inferior vena cava and the aorta (as in the supine and Trendelenburg position) in addition to compressing the diaphragm, making ventilation difficult.

The lateral position is usually well tolerated by obese patients. Proper size and placement of the axillary support is essential. Be careful that large, pendulous abdomens do not hang over the side of

the OR table, because they can have the effect of pulling the patient off the table via gravity. Standard safety straps may prove to be too short. The use of 3-inch silk or adhesive tape is indicated to stabilize the patient in place on the OR table.

Careful planning and selection of positioning equipment is key in providing a safe position for the patient. The nurse should apply knowledge and common sense to positioning. Stand back and look at the final position to see if everything looks right. Consult with the anesthesiologist and surgeon for their approval of the final position, and document the process accurately and completely in the nurse's record.

OTHER CONSIDERATIONS

Thermal Regulation

The benefits of maintaining temperature in surgery are well documented. For the obese patient, avoiding hypothermia prevents increasing the metabolic demand on the patient's body. Monitor the patient's temperature and provide appropriate interventions to maintain it. Forced air warmers are extremely efficient in helping to warm the patient, along with blood and intravenous fluid warmers.

Electrocautery

Because of the additional adipose on the patient, electrocautery current is altered. Higher-than-usual settings for cutting and coagulation may be necessary to achieve desired results. Return electrode placement should continue to be over the most muscular area available using the largest-size pad. Follow the manufacturer's guidelines on all electrocautery equipment.

Anti-embolic Stockings

Obese patients are predisposed to varicose veins and peripheral vascular disease and are at greater risk for the development of a deep vein thrombosis or thromboembolism. Place appropriately sized compression stockings on the patient to improve lower extremity circulation. Have the patient's postoperative, special hospital bed delivered directly to the OR suite so that the patient may be transferred directly onto the bed after surgery.

POSTOPERATIVE CARE

After surgery, the obese patient still requires the nurse's special consideration. A few final matters that the nurse should attend to include assessment of skin and respiratory function.

Skin Assessment

Assess the patient's skin immediately postoperatively, noting in particular any areas of breakdown or unusual redness. Determine if reddened areas are true pressure injuries or hyperemia. Document abnormal findings and notify the surgeon immediately.

Respiratory Function

Recovery room staff must be competent in the immediate postoperative care of the severely obese patient, especially in the area of respiratory support and airway management.

CONCLUSION

The care of the obese patient in the OR is a unique situation requiring care, compassion, knowledge, special equipment, and most importantly, teamwork and planning to ensure a safe surgical experience. It is hoped that the points presented in the article will assist the nurse in achieving a successful outcome for patients and surgeons alike.

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