
بسم الله الرحمن الرحيم

Obesity and cesarean section

DR SEYEDEH NOUSHIN GHALANDARPOOR_ATTAR

PERINATOLOGIST

BAQIATALLAH HOSPITAL

Obesity and cesarean section

- Obesity is a risk factor for cesarean birth, and the risks and challenges of cesarean birth increase with increasing severity of obesity. Perioperative planning and appropriate intervention help to reduce these risks and ensure optimal maternal and newborn outcomes.

PERIOPERATIVE CONSIDERATIONS

- The following factors increase morbidity in patients with obesity undergoing cesarean birth:
- Obesity is associated with numerous health hazards
- Obstructive sleep apnea (OSA) and obesity hypoventilation syndrome (OHS) are the most important respiratory problems associated with obesity
- Obesity increases the probability of both scheduled and emergency cesarean birth.

PERIOPERATIVE CONSIDERATIONS

- Incision-to-delivery time and total operative time are longer.
- Blood loss is increased, but blood transfusion requirements are not clearly higher
- Postoperatively, patients with obesity are at increased risk of wound infection and disruption, endometritis, and thromboembolism compared with patients with normal weight.

PERIOPERATIVE CONSIDERATIONS

- Peripheral intravenous lines may be difficult to place due to subcutaneous adiposity; central venous access may be needed if peripheral access is tenuous.
- Placement of neuraxial needles and catheters can be difficult because the usual anatomic landmarks are obscured, the patient may be unable to flex their back adequately, and the distance from skin to target is longer than normal.
- Mask ventilation may be difficult and intubation may be difficult or fail.
- Pharmacodynamics may be altered because patients with obesity have a larger volume of distribution for lipophilic drugs and a decrease in lean body mass and tissue water, compared with controls without obesity.
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ANESTHESIA

- Challenges and complications related to anesthesia are more common in patients with obesity, and include difficulty with monitoring, positioning, airway management, and neuraxial techniques, as well as longer surgical duration and increased risk of aspiration of gastric contents
- The choice between general and regional anesthesia should be guided by the urgency of the case, requirements of the surgical procedure, and comorbidities.
- Although patient preferences are also important, regional anesthesia is recommended for this patient population, especially those with severe obesity, because it is safer than general anesthesia

INTERVENTIONS TO REDUCE THE RISK OF COMPLICATIONS

- **Prevention of venous thromboembolism:**
- Thromboprophylaxis is typically recommended for patients with obesity undergoing cesarean birth, given that pregnancy, cesarean birth, and obesity are all risk factors for postpartum venous thromboembolism
- both mechanical and pharmacologic thromboprophylaxis are recommended for patients at higher risk of VTE, such as those with obesity
- We suggest application of an intermittent pneumatic compression device sized to accommodate large legs preoperatively, and add pharmacologic thromboprophylaxis postpartum once the patient is deemed stable from a surgical/anesthesia standpoint.

Prevention of surgical-site infection

- Important components of infection prophylaxis include using aseptic practices , minimizing duration of surgery, weight-based antibiotic prophylaxis, and preoperative optimum glycemic management in patients with diabetes
- **Preparation of the abdomen and vagina :** The abdomen and vagina are prepped with an antiseptic solution. Skin preparation with chlorhexidine-alcohol and vaginal preparation with chlorhexidine gluconate or povidone-iodine are reasonable options
- **Antibiotic prophylaxis:**
- Patients ≥120 kg: cefazolin 3 g IV within the 60 minutes prior to surgical incision
- Patients <120 kg: cefazolin 2 g IV within the 60 minutes prior to surgical incision
- consideration of additional intraoperative doses in patients with excessive blood loss or extended surgery (duration exceeding two half-lives of the drug)

Prevention of surgical-site infection

- For patients in labor and/or with rupture of membranes: add azithromycin 500 mg IV
- For patients with ruptured membranes who undergo cesarean birth without preoperative IV azithromycin, administering cefazolin 2 or 3 g IV preoperatively followed by cephalexin 500 mg orally plus metronidazole 500 mg orally every 8 hours for 48 hours following cesarean birth is another approach to reducing SSI.
- For patients with a true penicillin allergy (immediate hypersensitivity reaction), combination therapy with clindamycin 900 mg plus gentamicin 5 mg/kg (dosing weight) intravenously provides broad coverage

Prevention of aspiration

- **Prevention of aspiration:**
- Both pregnancy and elevated BMI are consistently associated with higher rates of gastroesophageal reflux.
- Measures to reduce the risk of aspiration (eg, fasting before scheduled cases and avoidance of solid food in labor; administration of no particulate antacids, H2-receptor antagonists and/or metoclopramide) are similar to those in pregnant patients without obesity.

Positioning and equipment

- **Transferring the patient to the operating table :**Moving and positioning the patient with obesity can be difficult and must be done carefully to prevent falls and other uncontrolled movements, as well as injury to the patient and staff
- **Choice of operating table :**Special operating tables may be needed. For example, a standard operating table has a weight capacity up to 500 pounds (227 kg), while a bariatric surgical table has a weight capacity up to 1000 pounds(454 kg). Bariatric table width extenders can be useful in increasing the support surface of the operating table

Positioning and equipment

- **Patient positioning:** Patient positioning is important to limit unfavorable physiological sequelae (eg, supine hypotension, respiratory dysfunction), provide optimum exposure for surgical procedures, and reduce the risk of perioperative nerve, joint, and soft tissue injury. Pressure points (including buttocks, lumbar region, and shoulders)should be well-padded to prevent skeletal muscle necrosis.
- Patients should be positioned with left uterine displacement to minimize the chance of aortocaval compression and supine hypotension. Traditionally, 15 degrees of lateral displacement is recommended.

Positioning and equipment

- **Blood pressure monitoring :** Blood pressure must be monitored with an appropriately sized blood pressure cuff. A thigh cuff is advised if the arm circumference is 45 to 52 cm and a large adult cuff if arm circumference is 35 to 44cm,
- If external measurements are not reliable, which sometimes happens in these cases, blood pressure can be monitored invasively
- **Intermittent pneumatic compression devices :** Intermittent pneumatic compression devices sized to accommodate large legs are applied preoperatively

Positioning and equipment

- **Surgical exposure :** A removable adhesive panniculus retractor/retention system or surgical tape placed prior to start of the cesarean for rostral retraction may improve exposure without concern for pressure points that may be caused by manual retraction.
- A self-retaining intraabdominal retractor can be added for the intraabdominal procedures.
- retracting an extremely large panniculus onto the thorax has been associated with cardiopulmonary compromise (eg, hypotension, hypoxia).

Positioning and equipment

- **Instruments and other supplies :** Long instruments and wide deep retractors (including panniculus retractors) are
- usually required to access structures deep in the pelvis. Appropriately sized gowns and stretchers and monitoring
- equipment must be available for patients with obesity

Abdominal wall incision

- The patient's body habitus, including weight distribution and panniculus size, should be carefully assessed before deciding upon the appropriate incision. The type of incision may affect exposure, ease of newborn delivery, postoperative pain and respiratory effort, wound strength, and wound complication rates.
- **Landmarks :** The surgeon must be aware of how abdominal wall adipose tissue can affect typical anatomic landmarks.
- The pubic symphysis and iliac crests are reliable landmarks regardless of maternal body habitus
- In patients with an apron-like panniculus, the umbilicus is a poor landmark for identifying pelvic organs
- the umbilicus may be caudal to the lower uterine segment

Abdominal wall incision

- Transverse or vertical? The choice of incision should be based on the surgeon's personal preference and judgment regarding patient specific technical factors (eg, type of pannus/where the weight is concentrated).
- Whether a transverse or vertical incision is superior for the pregnant patient with obesity remains controversial
- A large incision is especially important in the pregnant patient with obesity because uterine exposure may be
- suboptimal with a small incision, the fetus is likely to be large, and it is difficult to manually stretch the incision because of the thick abdominal wall
- The risk of infection can be reduced by not making multiple shallow strokes by scalpel or electrosurgery (which increases tissue damage) and by avoiding excessive dissection of the subcutaneous tissues (which increases dead space).

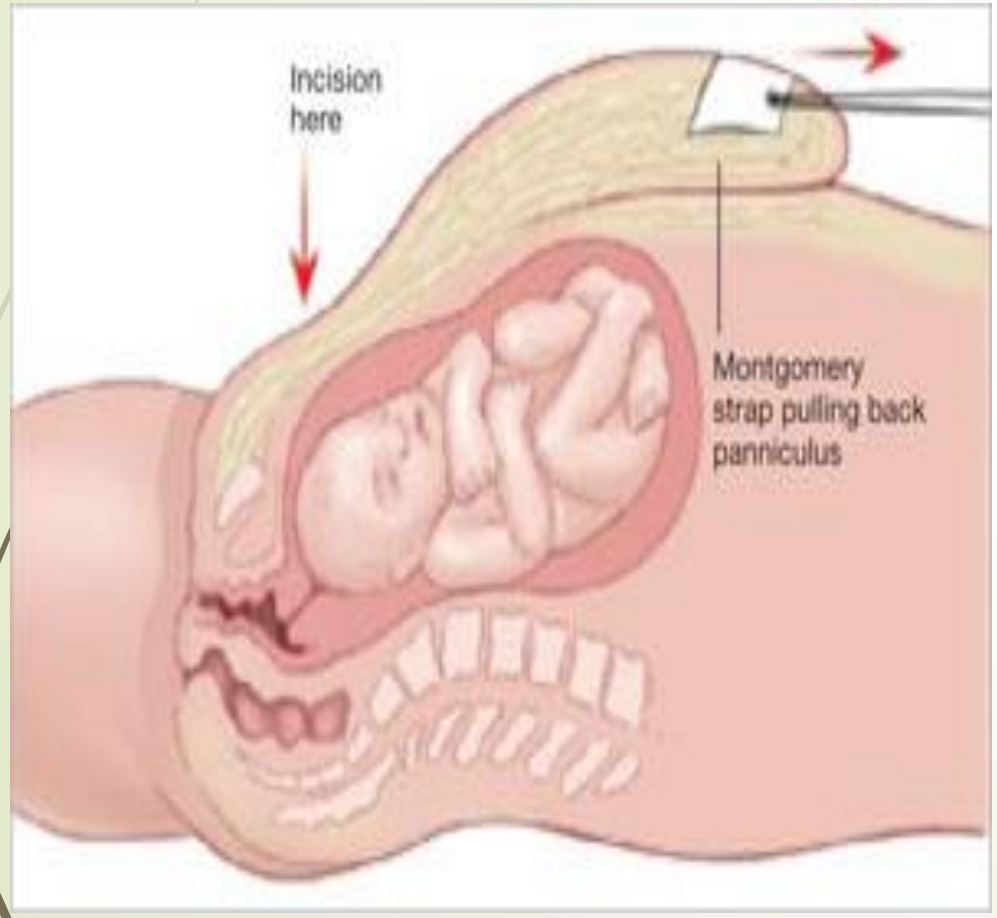
Suprapubic low-transverse incision

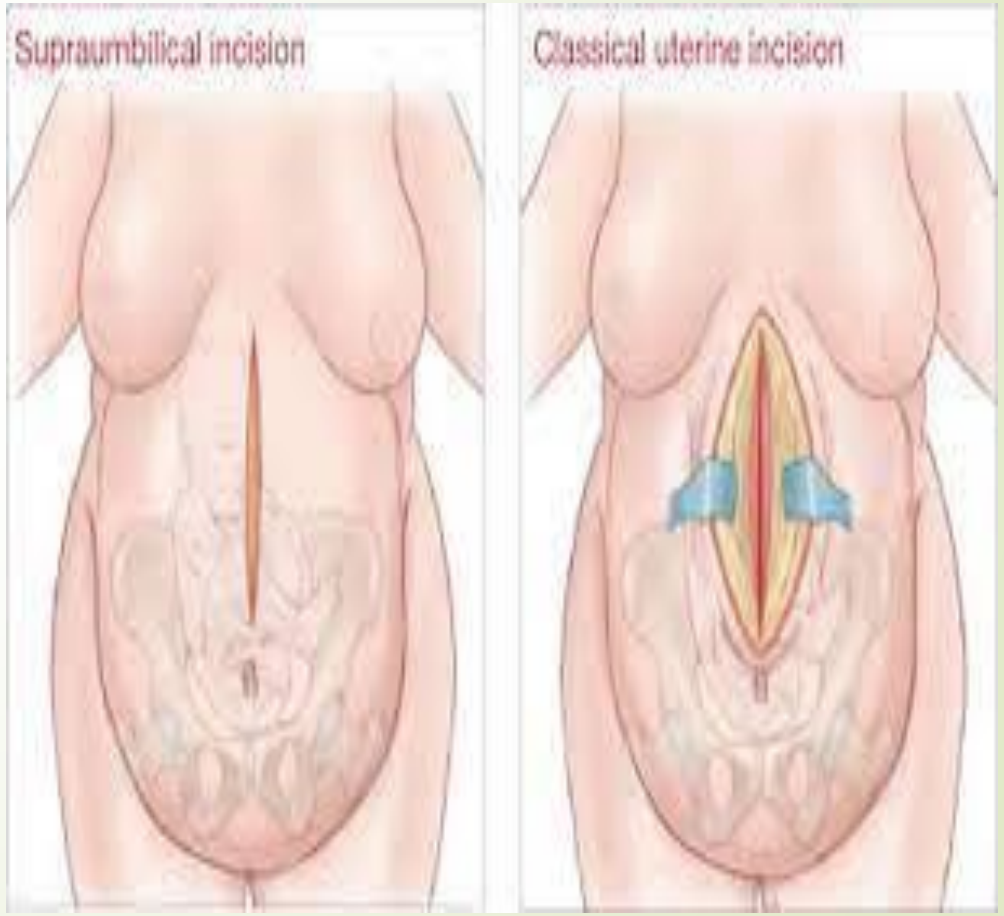
- The adipose tissue two finger-breadths cephalad to the pubic symphysis is not particularly thick, even in patients with severe obesity. For patients who weigh less than approximately 400 pounds (181 kg), elevating the panniculus and retracting it cephalad with a panniculus retractor/retention system or tape as discussed above allows placement of a low-transverse (eg, Pfannenstiel) or low midline (vertical) incision.
- A disadvantage of making an incision under the panniculus is that the wound must heal in a warm, moist environment with high bacterial colonization, thus potentially increasing the risk of infection.

Supraumbilical incision

- **Transverse :** For patients who weigh over 400 pounds (181 kg), and particularly those over 600 pounds (272kg), a transverse supraumbilical incision has some advantages: it has the strength of the transverse repair , avoids burying the wound under a large panniculus, and provides excellent abdominal exposure
- **Vertical:**A disadvantage of supraumbilical incisions is that exposure to the lower uterine segment can be suboptimal,necessitating a vertical hysterotomy, which is made in the midportion of the uterus extending toward the fundus.Rarely, this may require extracting the fetus as a breech.
- An alternative suprapannicular subumbilical incision technique that displaces the panniculus caudal has been described

Suprapubic low-transverse incision



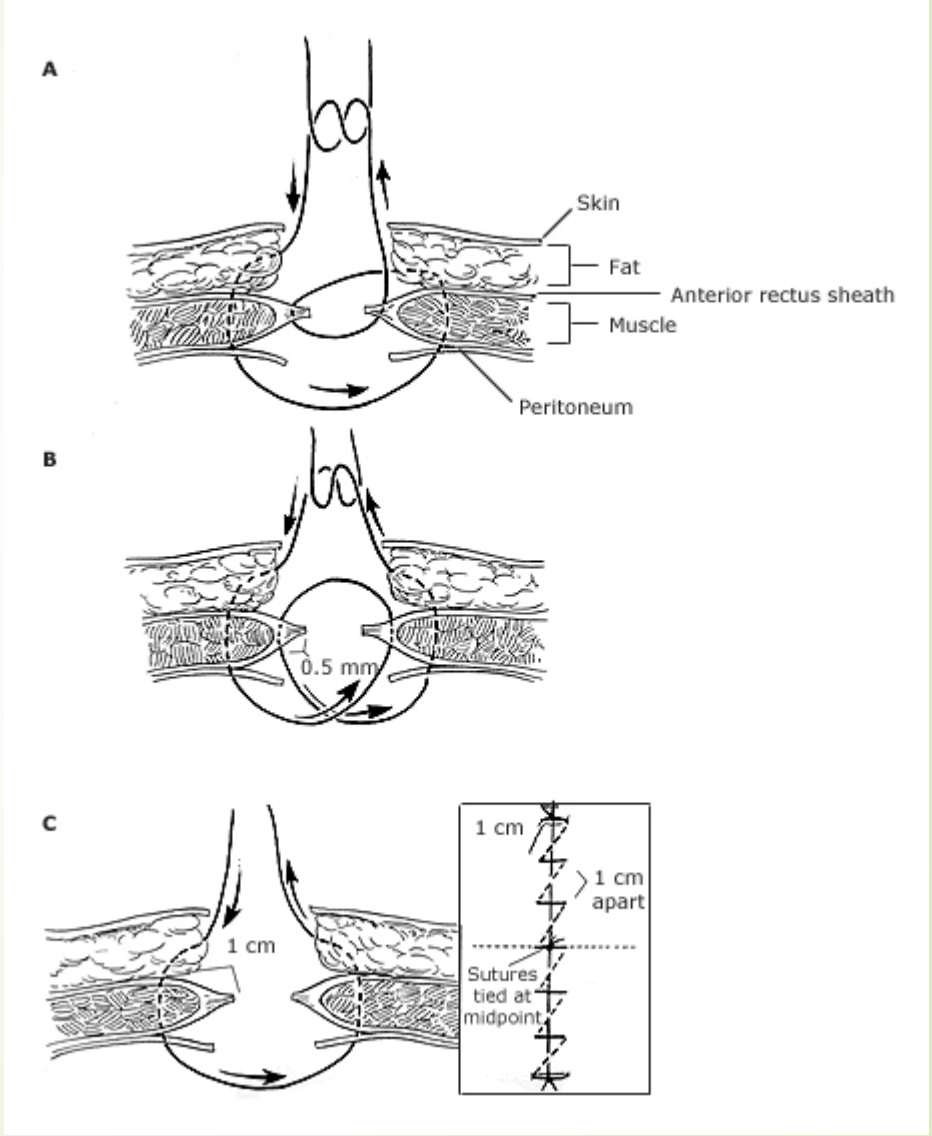


Hysterotomy incision

- We prefer a transverse incision in the lower uterine segment because it is associated with the lowest rate of uterine rupture in subsequent pregnancies. This is especially important for pregnant patients with obesity in whom rapid administration of anesthesia and cesarean birth may not be technically possible if the uterus ruptures in a future pregnancy
- The fetus can be difficult to extract because of the location of the hysterotomy and/or the surgeon's or assistant's inability to provide adequate fundal pressure. Some options to facilitate extraction include delivery as a breech or use of a forceps blade or vacuum device.

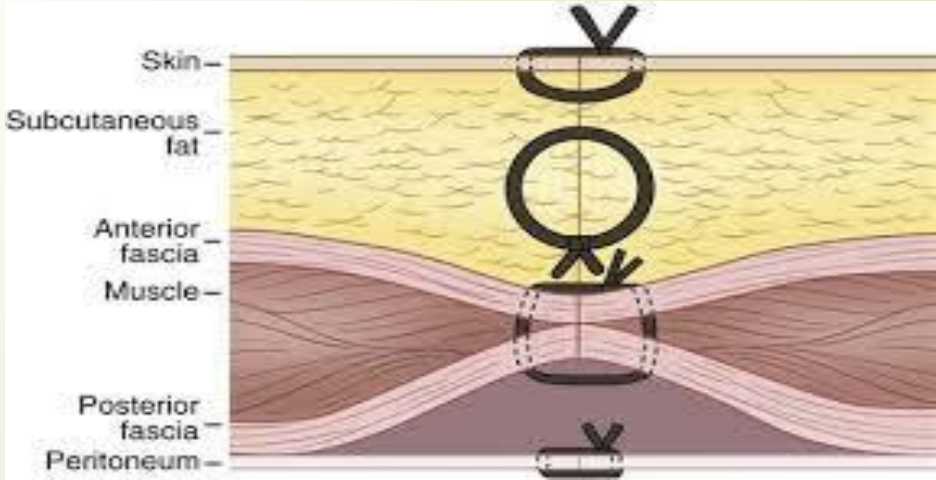
Fascial closure

- **Midline incision:** Mass closure of vertical incisions may reduce the risk of dehiscence and hernia formation compared with layered closure.
- The classic Smead-Jones technique (far-far-near-near) or an alternative approach (far-near-near-far) are acceptable methods.
- The key point is to approximate the fascia without strangulation
- **Transverse incision:**Few randomized trials have evaluated the optimum closure technique for transverse fascial incisions. A continuous nonlocking closure with slowly absorbable #0 or 1 braided suture (eg, polyglactin 910) is a common approach



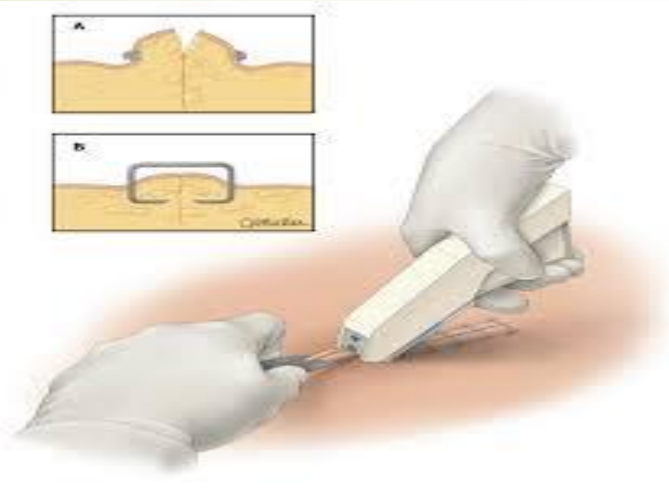
Subcutaneous closure

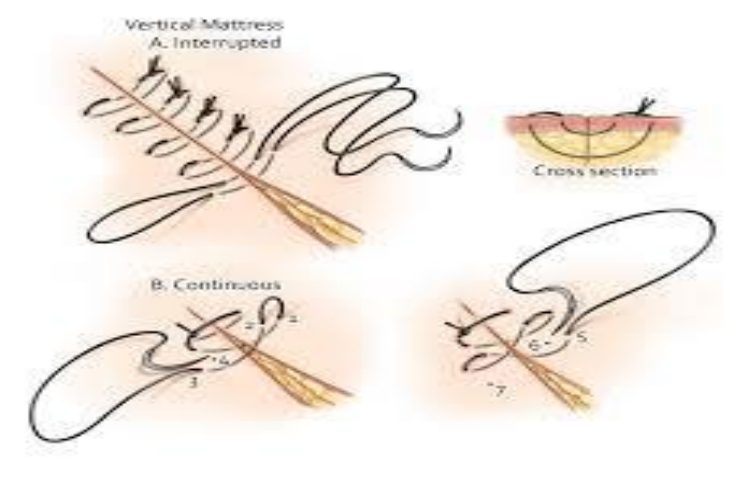
- The subcutaneous adipose layer should be closed when the layer is ≥2 cm thick; an absorbable 3-0 running suture is commonly used
- suture closure of the
- subcutaneous adipose layer at cesarean birth decreased the risk of subsequent wound disruption by one-third in patients with subcutaneous tissue depth ≥2 cm
- Drains:Subcutaneous drains are not recommended, as randomized trials show no clear benefit in the overall obstetric population



Skin closure

- Although practice in the overall obstetric population has shifted toward suture rather than staple closure, data are limited on the effect of skin closure method on the incidence of wound complications in patients with obesity who undergo cesarean birth.





POSTOPERATIVE CARE

- **Close monitoring:**Patients with obesity require close postoperative monitoring. Those with OSA, OHS, or significant cardiac disease should be admitted to a unit that can provide continuous cardiopulmonary monitoring for as long as it is needed, generally 24 hours. Fluid intake and output should also be monitored closely to maintain euvolemia,especially in patients with cardiopulmonary disease.
- **Positioning:**Both a head-up, 30-degree position and lateral decubitus positioning minimize compromise to airway and respiratory function. A Troop elevation pillow may assist in head elevation.
- If the patient develops vaginal bleeding and needs to undergo a speculum examination, the lithotomy and Trendelenburg positions can reduce ventilation by decreasing lung volume and increasing the work of breathing, but do increase venous return and cardiac output. Therefore, patients should be appropriately monitored during such examinations.

POSTOPERATIVE CARE

- **Respiratory physiotherapy:** Respiratory physiotherapy, including incentive spirometry, can be helpful to reduce atelectasis. Noninvasive continuous positive airway pressure is useful for patients preoperatively identified to have OHS or OSA
- **Early ambulation:** Early ambulation may improve bowel function, as well as decrease the risk of venous thrombosis.Physical therapy may be helpful for patients with mobility limitations.

Pain management

- **management:**Multimodal, opioid-sparing analgesia relies on various treatment modalities utilizing multiple analgesics with different mechanisms of action and side effects. Using multimodal analgesia seems to be the best approach to provide pain relief adequate to support ambulation, allow the patient to be alert and energetic to care for the newborn, minimize drug transfer into breast milk, and minimize side effects in both the mother and newborn. Avoidance of unnecessary opioid exposure is important in all patients to minimize risk for opioid use disorder.
- In patients with a history of OSA or obesity hypoventilation syndrome (OHS), opioid-related respiratory depression is an additional concern.

Pain management

- When opioids are needed to provide adequate pain control, use of multimodal analgesia allows a reduction in the dose.
- Opioids can be administered via oral, parenteral, and neuraxial routes
- Neuraxial opioids are preferred over parenteral opioids because they minimize the risk of respiratory depression and provide better analgesia
- Neuraxial administration does not eliminate the risk of respiratory depression
- When opioids are administered postoperatively, patients should be closely monitored with continuous pulse oximetry (eg, hourly in the first 24 hours and every two hours in the second 24 hours after cesarean

Wound care

- If the incision is under the panniculus, placing clean rolled towels beneath the panniculus postoperatively or an adhesive panniculus retractor improves air circulation.
- incisions should be closely monitored for signs of infection or disruption, even after the patient leaves the hospital
- Negative pressure wound therapy:We do not use negative pressure wound therapy as part of postoperative wound care on our service as the overall value of the intervention in patients with obesity undergoing cesarean birth remains unproven. Negative pressure wound therapy may reduce surgical site infection (SSI), but experience with clean, closed surgical wounds is limited and, among patients with severe obesity, there are few reports of its use in post cesarean birth according to abdominal skin incision type.

Take home message

- Patients with obesity may have additional health hazards that affect their morbidity from cesarean birth. Cesarean birth of these patients often requires modifying equipment, anesthesia and analgesia, and surgical technique to ensure an optimal outcome.
- When making the skin incision, attention to the distorted landmarks in patients with obesity is very important.


Thank you for your attention!
Questions? (We love 'em)


Thank You!