

Obesity and the Critical Care Pregnant Patient

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KEYWORDS

- Obesity (morbid, super) • Maternal mortality • BMI
- National Health and Nutrition Examination Survey

KEY POINTS

- Obesity puts the gravid patient at risk for serious health problems such as diabetes in pregnancy, hypertensive diseases, and obstructive sleep apnea.
- The antepartum issues that are influenced by obesity all contribute to cardiovascular health problems, which are linked to a higher rate of maternal mortality.
- Obese gravidas, compared with normal-weight gravidas, experience an increased number of intrapartum difficulties, such as labor dystocia, and prolonged operative course.
- Obese gravidas also experience more complications in the immediate postnatal and puerperal recovery periods.
- Anesthetic management of the obese pregnant patient is made problematic by the physiologic changes in body habitus, some of which may require advanced critical care and support.

CASE PRESENTATION

A 27-year-old gravida 2 para 1001 presents at 38 0/7 weeks for repeat cesarean section. Her medical history is significant for superobesity. Her prepregnancy weight was 560 lbs (254 kg). She is 5'3" tall (1.6 m), giving her a total body mass index (BMI) of 99.2 kg/m² at intake appointment.

This pregnancy has been complicated by gestational diabetes, for which she initially started metformin. However, for the last 3 weeks, she has been on subcutaneous insulin (currently 40 U of long-acting insulin and 20 U of immediate-acting insulin

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with each meal). She has required steady dose increases to maintain euglycemia. She has experienced fluctuating bouts of hypoglycemia in between her predominant hyperglycemic episodes, which led to her current set insulin dosing at each meal.

Her past medical history is significant for a previous pulmonary embolism owing to a deep venous thrombosis, both of which occurred spontaneously, during the puerperal period of her last pregnancy. She was tested for thrombophilias, all of which were negative for significant findings. Her laboratory tests show a homozygous MTHFR defect without an elevated homocysteine level.

Her past obstetric history was significant for a previous cesarean section at 40 weeks gestation after prolonged labor (per the attending note: "failure to descend"). The infant weighed 7 lb 4 oz at 40 weeks. That pregnancy was otherwise uncomplicated.

On day of delivery, her admission physical now shows her weight to be 612 lbs (277.6 kg). The patient states she started feeling contractions last evening, which have progressed to the point where her contractions are now occurring every 8 to 10 minutes. Her blood glucose values before admission have fluctuated between 68 and 170 mg/dL.

Current medications include insulin, and enoxaparin, which was replaced by twice daily heparin injections starting 1 week ago.

The cesarean section is performed under combined spinal epidural anesthesia that results in the delivery of a 4785 g infant. The surgeons enter the peritoneal cavity through a vertical, supraumbilical incision, and the infant is extracted through a posterior, fundal classical uterine incision. The total operative time is longer than 2.5 hours.

Postnatally, the patient is restarted on heparin, but her dosing is changed by different providers, likely owing to her large volume of distribution. She is also started on warfarin (Coumadin) at the end of postoperative day 1.

On postoperative day 2, she notes a headache that runs from the top of her head to the back of her neck, which is temporarily alleviated with oral narcotics, promethazine (Phenergan) and caffeine. However, the headache persists. The anesthesia service consults, but declines blood patch placement owing to her anticoagulation. Of note, she continues on both warfarin and heparin throughout her postpartum course, which is extended as an inpatient owing to her symptoms and the fact that she cannot consistently reach her target international normalized ratio value.

On postoperative day 6, the patient exhibits mental status changes: somnolence, unintelligible mumblings, and falls to her knees once. No specific focal neurologic signs are discerned. Neurologic consultants order a computed tomography scan, but her size makes the imaging study impossible. A naloxone (Narcan) challenge is given without improvement. Unfortunately, patient mental status declines and she becomes obtunded.

The patient is transferred to the intensive care unit and intubation is required. Aggressive efforts to reverse anticoagulation are empirically started, but the patient shows papilledema, loss of corneal and doll's eye reflexes, and absent gag response. An electroencephalogram done after reversal of sedation shows absent cortical activity and an apnea test confirms no brain stem response. The decision is made to withdraw life support on postoperative day 8.

INTRODUCTION

Obesity has long been a subject of intermittent study. The medical literature characterizing the period prevalences of obesity in industrialized nations may be traced for

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