



Anesthetic management of super-morbidly obese parturients for cesarean delivery with a double neuraxial catheter technique: a case series

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ABSTRACT

Parturients with super-morbid obesity, defined as body mass index greater than 50 kg/m², represent a growing segment of patients who require anesthetic care for labor and delivery. Severe obesity and its comorbid conditions place the parturient and fetus at greater risk for pregnancy complications and cesarean delivery, as well as surgical and anesthetic complications. The surgical approach for cesarean delivery in these patients may require a supra-umbilical vertical midline incision due to a large pannus. The dense T4-level of spinal anesthesia can cause difficulties with ventilation for the obese patient during the procedure, which can be prolonged. Patients also may have respiratory complications in the postoperative period due to pain from the incision. We describe the anesthetic management of three parturients with body mass index ranging from 73 to 95 kg/m² who had a cesarean delivery via a supra-umbilical vertical midline incision. Continuous lumbar spinal and low thoracic epidural catheters were placed in each patient for intraoperative anesthesia and postoperative analgesia, respectively. Continuous spinal catheters were dosed with incremental bupivacaine boluses to achieve surgical anesthesia. In one case, the patient required respiratory support with non-invasive positive pressure ventilation. Two cases were complicated by intraoperative hemorrhage. All patients had satisfactory postoperative analgesia with a thoracic epidural infusion. None suffered postoperative respiratory complications or post-dural puncture headache. The use of a continuous lumbar spinal catheter and a low thoracic epidural provides several advantages in the anesthetic management of super-morbidly obese parturients for cesarean delivery.

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Introduction

Obesity has become a public health epidemic in many nations worldwide, and is a serious health problem among reproductive-aged women. Super-morbid obesity, or body mass index (BMI) ≥ 50 kg/m², and its comorbid conditions place the parturient and fetus at increased risk of complications related to pregnancy, surgery and anesthesia.^{1,2} The peripartum care of these patients for cesarean delivery is challenging, and requires careful, multidisciplinary planning and communication to optimize patient outcomes.

We describe the anesthetic management of three parturients with BMI ranging from 73 to 95 kg/m² for cesarean delivery. The obstetricians planned a midline, supra-umbilical vertical skin incision for each patient, as it was thought that a large pannus would complicate

a Pfannenstiel incision. Surgical anesthesia was delivered via a lumbar spinal catheter, and a low thoracic epidural catheter was placed for postoperative analgesia. The use of two epidural catheters (low thoracic and lumbar) for cesarean delivery in a super-morbidly obese parturient has been previously reported,³ but we are not aware of any reports of a technique that incorporates a spinal catheter.

Case series

Three pregnant women, 29–40 years old, with super-morbid obesity were referred for anesthetic evaluation in the third trimester in preparation for elective cesarean delivery. Their co-morbidities and airway examinations are described in [Table 1](#). All women underwent transthoracic echocardiography (TTE) and were screened for obstructive sleep apnea (OSA) in the third trimester, if that diagnosis was not already established.

On the day of delivery, two 18-gauge peripheral intravenous catheters and a radial arterial line were placed before surgery. On the operating table, in a seated position, each patient received a lumbar intrathecal catheter for primary anesthesia at L3–4 or L4–5, as well as a low thoracic epidural catheter. Identification of landmarks

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Table 1 Details of preoperative examination and anesthetic management for cesarean delivery of three parturients with super morbid obesity

| | Case 1 | Case 2 | Case 3 |
|--|---|---|---|
| Height (cm) | 154.9 | 160 | 157.5 |
| Weight (kg) | 175.1 | 244 | 197 |
| Body mass index (kg/m ²) | 73.0 | 95.3 | 79.4 |
| Airway examination | Mallampati class 4; short, thick neck with limited extension; adequate mouth opening & thyromental distance; dyspnea when reclining beyond 45° | Mallampati class 2; thick neck; adequate mouth opening, neck extension & thyromental distance | Mallampati class 3; thick neck; adequate mouth opening, neck extension & thyromental distance |
| Past medical history | Chronic hypertension Obstructive sleep apnea on BiPAP Asthma CHF (diastolic dysfunction) Insulin-dependent diabetes mellitus | Prior cesarean delivery Chronic hypertension | Prior cesarean delivery Chronic hypertension Tobacco use Gastroesophageal reflux disease |
| Gestational age (weeks, days) | 37, 0 | 38, 1 | 39, 4 |
| Anesthetic technique* | <i>Thoracic epidural</i> T11–12; LOR at 11 cm <i>Lumbar spinal catheter</i> CSF at 9 cm Landmark-guided | <i>Thoracic epidural</i> T10–11; LOR at 12 cm <i>Lumbar spinal catheter</i> CSF at 10 cm Ultrasound-guided | <i>Thoracic epidural</i> T10–11; LOR at 13.5 cm <i>Lumbar spinal catheter</i> CSF at 9 cm Landmark-guided |
| Neuraxial dosing for surgical anesthesia | <i>Pre-incision</i> <i>Intrathecal</i> : 10 mg bupivacaine, in two divided doses → T5 fentanyl 15 µg, morphine 150 µg with initial dose <i>Maintenance dose</i> 10 mg bupivacaine | <i>Pre-incision</i> <i>Intrathecal</i> : 7.5 mg bupivacaine, in two divided doses → T6 fentanyl 15 µg, morphine 150 µg with initial dose <i>Maintenance dose</i> 2.5 mg bupivacaine | <i>Pre-incision</i> <i>Intrathecal</i> : 13.75 mg bupivacaine, in three divided doses → T8 fentanyl 15 µg, morphine 150 µg with initial dose <i>Epidural</i> : 2% lidocaine 8 mL → T6 <i>Maintenance dose</i> <i>Intrathecal</i> : 2.5 mg bupivacaine <i>Epidural</i> : 2% lidocaine 3 mL |
| Apgar score (1 min, 5 min) | 2, 9 | 7, 9 | 4, 9 |
| Vasopressor requirement | None | Phenylephrine 1000 µg | None |
| Total surgical time (min) | 240 | 240 | 80 |
| Need for intraoperative ventilation | BiPAP | None | None |
| Estimated blood loss (mL) | 3000 | 2000 | 900 |
| Postdural puncture headache | None | None | None |

*17-gauge, five inch Tuohy needle used to introduce all spinal and epidural 20-gauge Smith-Portex catheters. CHF: congestive heart failure; BiPAP: bilevel positive airway pressure; LOR: loss of resistance; CSF: cerebrospinal fluid.

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