

# Anaesthetic Management of a Morbidly Obese Parturient Undergoing Cesarean Section

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## Abstract:

### Summary

*An increasing number of women with a morbid obesity are requiring anaesthetic care for labour and delivery. Management of these patients presents obstetric, anesthetic, and logistical challenges. We report our experience in the management of elective Caesarian section of a morbidly obese (BMI 61.6 kg/m<sup>2</sup>) parturient under epidural anaesthetic technique. Despite the increased risk of morbidity and mortality, our patient had an optimal outcome. An awareness of the hemodynamic and respiratory stability during anaesthetic management, postoperative analgesia and careful thromboprophylaxis will benefit parturient with morbid obesity.*

*Key Words: Morbid obesity; Caesarian section; Epidural anaesthesia*

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## Introduction

The World Health Organization (WHO) reported in 2016, more than 1.9 billion adults, 18 years and older, were overweight and of these over 650 million were obese.<sup>1</sup> On a worldwide scale, the prevalence of obesity has clearly increased markedly in recent decades, and women of childbearing age are certainly part of this global phenomenon.<sup>2</sup> Obesity has been identified as a significant risk factor for respiratory and infectious complications in general surgery<sup>3</sup> and for anaesthesia related mortality in obstetrics.<sup>4</sup> When compared to normal weight parturient obese patients are at increased risk of having either concurrent medical problems or superimposed antenatal diseases including pre-eclampsia and gestational diabetes.<sup>5</sup> Complications during labor such as intrapartum foetal distress, failure to progress, abnormal presentation necessitating instrumental delivery and cesarean section are more common.<sup>5,6</sup> In addition there is an increased

incidence of deep vein thrombosis, hypoxaemia, and wound infections perioperatively.<sup>7</sup> Furthermore, the anaesthesiologist frequently has to deal with technical difficulties regarding airway management and regional anaesthesia.<sup>7</sup>

We report case of a morbidly obese parturient underwent elective cesarean section highlighted the complexity and challenges that are associated with the anaesthetic care of this patient population.

## Case Report

We assessed this 30-year-old woman, 37 weeks pregnancy with history of one previous cesarean section under spinal anaesthesia. The patient's body weight was 148 kg and her body height was 154.94 cm (body mass index = 61.6 kg/m<sup>2</sup>). The patient's airway appeared unremarkable (Mallampati II, thyromental distance 7 cm), venous access looked obtainable and anatomical

landmarks of the spine were palpable. Her haemoglobin was 12.10 gm/dl, oxygen saturation was 97% on room air, ECG and echocardiogram showed normal cardiac function with a left ventricular ejection fraction of 65%. She was accepted in ASA Grade III and considering that she was morbidly obese and had had one previous cesarean section under spinal anaesthesia, epidural technique was proposed and consent obtained.

At 09:00 AM on the scheduled day, patient was brought to operation theatre, IV access was secured with 18-gauge cannula and routine monitoring was established. The patient in sitting position, epidural block was performed at the L2-3 interspace using a 10 cm 18(G) Touhy needle. The epidural space was located without difficulty at 8 cm and the epidural catheter was advanced 4 cm into the epidural space uneventfully and secured with adhesive dressings. A test dose of 3 ml lidocaine 2% 3 mL of with epinephrine 1:200 000 was administered and a bolus of a total of 15 ml bupivacaine 0.5% was injected in increments of 5 ml leading to a confirmed bilateral sensory block to the T4 dermatome to touch and cold, was established prior to skin incision. Blood pressure was maintained within normal values by intravenous hartmann's solution 1500 ml and single dose of inj ephedrine 5 mg intravenously. A healthy female baby was delivered uneventfully at 0935 AM. The uterine cavity was closed and haemostasis was obtained. Estimated blood loss was 750 ml. Surgical procedure was completed after 90 minutes of skin incision and the patient was transferred to the postoperative ward.

Postoperative analgesia was maintained with 6-8 ml of 0.25% bupivacaine with fentanyl 2µg/ml, injected through epidural catheter 4 hourly for 48 hours. Epidural catheters was removed after 48 hours postoperatively. After 4 hours of removal of epidural catheter DVT prophylaxis started by enoxaparin 40 mg SC Daily; for next 5 days. She

was followed up on day 3 and then 4 weeks later over telephone and was found to be satisfied and very pleased with the entire conduct of peri-operative care and hospital stay with no complaints.

## Discussion

Although there are no pregnancy-specific definitions of obesity, pregnant women are considered obese when the BMI is  $> 30$  kg/m<sup>2</sup>. Morbid obesity is described as a BMI  $> 40$  kg/m<sup>2</sup>.<sup>8</sup> Morbidly obese pregnant women are at increased risk for hypertensive disorders (e.g., preeclampsia, chronic hypertension), coronary artery disease, respiratory disorders (e.g., asthma, sleep apnea), cerebrovascular disease, diabetes mellitus, nonalcoholic fatty liver disease as well as thromboembolic disease.<sup>5</sup> All of these conditions can complicate obstetric management and lead to greater maternal, neonatal, surgical, and anaesthetic risk.

These patients are also at increased risk for instrumental and cesarean delivery.<sup>5</sup> The risk of cesarean section increases linearly with increasing BMI. Cesarean deliveries are more often complicated by longer operative times, increased operative blood loss and postpartum hemorrhage, postoperative endometritis, wound infection, as well as increased length of hospital stay. Hood and Dewan<sup>7</sup> noted that all major postpartum complications in morbidly obese women were associated with cesarean section. In spite of the technical difficulties associated with regional anaesthesia in the morbidly obese such as patient positioning, identification of anatomical landmarks, and frequent dislodgment of epidural catheters,<sup>9</sup> its successful use for cesarean section has been reported.<sup>9</sup> Epidural anaesthesia offers several advantages, including an easily titratable local anaesthetic dose and level of anaesthesia, ability to extend the block for surgical delivery and prolonged surgery,

slower and more easily controllable hemodynamic changes, decreased potential for excess motor blockade and its utilization for postoperative analgesia.<sup>10,11</sup>We therefore opted epidural anaesthesia for elective cesarean section in this particular patient.

The epidural space was reached at 8 cm which is in agreement with other reports in morbidly obese subjects demonstrating that it is rarely deeper than 8 cm in this patient population.<sup>12</sup>The presence of epidural fat and increased venous distension from aortocaval compression increases the cephalad spread of epidural local anaesthetic in obese parturient and the risk of hypotension and respiratory embarrassment is greater when compared to the lean parturient.<sup>13</sup>We carefully titrated the dose of epidural local anaesthetic the injection of these boluses of bupivacaine 0.5% and fall in systemic blood pressure was not remarkable.

Morbid obesity increases the risk for postoperative complications, including: hypoxaemia, atelectasis, deep venous thrombosis, pulmonary embolus, pneumonia, pulmonary edema, postoperative endometritis, wound infection, and dehiscence.<sup>14</sup>Early ambulation, thromboprophylaxis, chest physiotherapy, and effective postoperative pain control are essential in preventing complications in these patients. Regional anaesthetic techniques has a clinical impact beyond its well-acknowledged beneficial effects of reducing pain, reduced opioid consumption, and improved quality of early recovery.<sup>15</sup>We maintained postoperative analgesia for this patient with 6-8 ml of 0.25% bupivacaine with fentanyl 2µg/ml, injected through epidural catheter 4 hourly for 48 hours and the postoperative period was uneventful.

Caesarean section itself is a risk factor for deep venous thrombosis (DVT). Others include

obesity, high parity, infection, pre-eclampsia, dehydration and immobility.<sup>16</sup>Thromboprophylaxis should be commenced as soon as the immediate risk of haemorrhage is reduced. Epidural and spinal anaesthesia both reduce DVT risk by improving blood flow through the legs secondary to sympathectomy-induced vasodilatation; both anaesthesia methods may also reduce perioperative hypercoagulability that occurs as a result of the surgical stress response.<sup>17</sup>In this patient we administered epidural analgesia for 48 hours to reduce the risk of DVT. After 4 hours of removal of epidural catheter DVT prophylaxis done by enoxaparin 40 mg SC Daily; for next 5 days.

### Conclusion

The prevalence of obesity is increasing, and it is associated with significant comorbidities and increased obstetric, neonatal, surgical, and postoperative complications. Antepartum anaesthetic consultation should be performed to evaluate comorbidities, counsel patients, and plan for care. Successful management of the morbidly obese parturient requires a multidisciplinary team approach initiated early in pregnancy. Epidural anaesthesia is a safe option and effective in morbidly obese parturient undergoing cesarean section. Adequate postoperative analgesia and thromboprophylaxis are critical in the postoperative period.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent. In the form, the patient has given consent for her images and other clinical information to be reported in the journal. The patient understands that their names and initials will not be published and due efforts will be made to conceal their identity.



Figure 1: Patient in sitting position for preparation of epidural anaesthesia.



Figure 2: Performing epidural anaesthesia.



Figure 3: Patient in supine position.

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