

Spinal Anaesthesia for Caesarean Section in a Morbidly Obese Parturient: A Case Report

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Abstract

The population of obese individuals is increasing worldwide. Maternal obesity is an important risk factor in pregnancy and problems such as difficulty in endotracheal intubation, risk of aspiration, and hypoxia may occur during general anaesthesia. A 28-year-old woman (height 1.6 m, body weight 126 kg, BMI 49.2 kg/m²) visited GCS Hospital, Ahmedabad for selective caesarean section at a gestational age of 37 weeks. Patient was diagnosed with PIH. Spinal anaesthesia was selected because of the high possibility of endotracheal intubation failure due to super morbid obesity. Considering the possibility of hypotension, an arterial cannula was placed in the right radial artery for invasive arterial pressure monitoring. After sterile preparation, spinal anaesthesia was performed through the L3–4 interspinous space using a 90 mm 24-gauge spinal needle. During surgery, Blood pressure was maintained between 160/88 and 86/38 mm Hg and heart rate was maintained between 70 and 104 beats/min. The surgery was completed uneventfully. The block level of spinal anaesthesia was maintained at the T8 dermatome level during the operation and was also confirmed at the end of operation.

Keywords : BMI, Caesarean section, Morbid obesity, Spinal anaesthesia

Introduction:

The population of obese individuals is increasing worldwide.⁽¹⁾ The World Health Organization uses the body mass index (BMI) to define a normal weight as 18.9 to 24.9 kg/m², overweight as 25 to 29.9 kg/m², and obese as 30 kg/m² or more. Class I obesity is defined as BMI 30 to 34.9 kg/m², class II obesity as BMI 35 to 39.9 kg/m², and class III obesity as BMI 40 kg/m² and above.⁽²⁾ BMI 40 kg/m² and above is defined as morbid obesity, and BMI 50 kg/m² and above is defined as super morbid obesity.^(3,4) As the number of obese people increases, the number of morbidly obese parturients who undergo caesarean sections is also increasing. In patients with morbid obesity, the frequency of a caesarean section is more than double that in normal parturients and the risk of gestational

hypertension, preeclampsia, gestational diabetes, macrosomia, and wound complications is also increased. In addition, there is a high incidence of endotracheal intubation failure during general anaesthesia, a high risk of death from sequelae of the lung or heart, and a high incidence of failure and sequelae in regional anaesthesia.^(5–7) In pregnancy, functional residual capacity decreases and oxygen consumption increases, especially in obese parturients. Therefore, maternal obesity is an important risk factor in pregnancy, and problems such as difficulty in endotracheal intubation, risk of aspiration, and hypoxia may occur during general anaesthesia. If there is no contraindication to it, regional anaesthesia is preferred to general anaesthesia. Although the number of morbidly obese parturients undergoing caesarean section is increasing, little is known about which anaesthetic technique is appropriate for them. We report a case of spinal anaesthesia performed during the caesarean section of a 37 weeks pregnant woman with super morbid obesity (BMI 49.21 kg/m²). The patient consented to the publication of this case report.

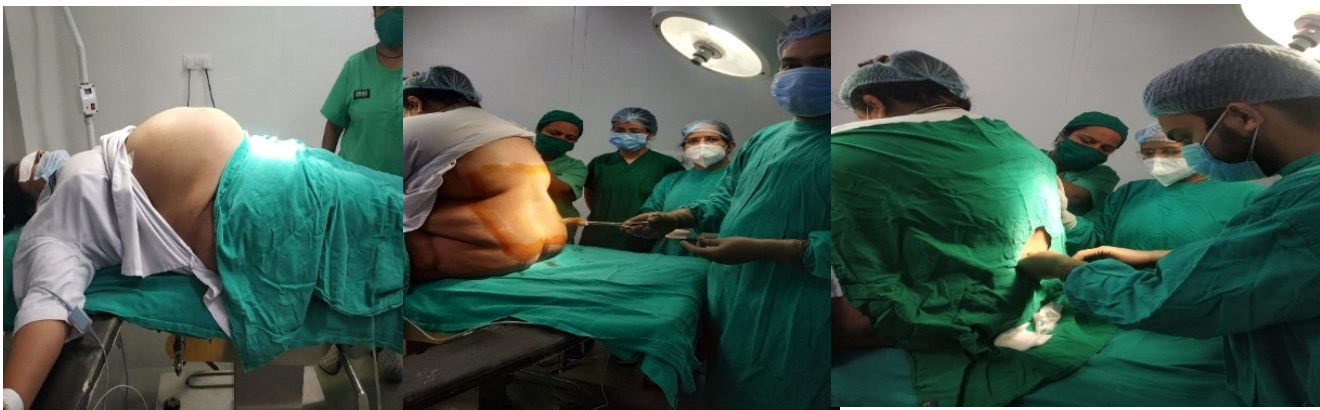
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Case report:

A 28-year-old woman (height 1.6 m, body weight 126 kg, BMI 49.2 kg/m²) visited GCS Hospital Ahmedabad for selective caesarean section at a gestational age of 37 weeks. Patient was diagnosed with PIH.

In preoperative anaesthetic evaluation, spinal anaesthesia was selected because of the high possibility of endotracheal intubation failure due to super morbid obesity. The patient entered the operating room after 8 hours of fasting. The vital signs measured before induction of anaesthesia were as follows: blood pressure 180/104mm Hg, heart rate 92 beats/min, body temperature 37.0°C, respiratory rate 18 breaths/min, and pulse oxygen saturation level 97%. Considering the possibility of hypotension, an arterial cannula was placed in the right radial artery for invasive arterial pressure monitoring during spinal anaesthesia. The patient was placed in a sitting position. After sterile preparation, the skin was locally anesthetized with 2% lidocaine, and spinal anaesthesia was performed through the L3–4 interspinous space using a 90 mm 24-gauge spinal needle. After dura puncture, cerebrospinal fluid was confirmed, and 10mg of 0.5% hyperbaric bupivacaine was injected into the subarachnoid space. The patient was then placed in a supine position, and the block level of spinal anaesthesia was checked. A sensory block test to cold alcohol pads confirmed nerve block to the T8 dermatome level. Immediately after spinal anaesthesia, invasive arterial blood pressure was measured as 176/98mm Hg and heart rate as 100 beats/min. Seven minutes after the operation began, a baby weighing 4.2 kg was delivered; the baby had APGAR

scores of 7 and 9 at 1 and 5 minutes, respectively. Invasive arterial blood pressure was maintained between 160/88 and 86/38 mm Hg and heart rate was maintained between 70 and 104 beats/min. The surgery was completed uneventfully with an estimated blood loss of 700 ml. The intravenous fluids injected intravenously during surgery were 300 mL of colloid and 1400 mL of crystalloid. The total operation time was 72 minutes. The block level of spinal anaesthesia was maintained at the T8 dermatome level during the operation and was also confirmed at the end of operation. The patient did not experience intraoperative pain. For post operative pain relief USG guided TAP block was given. After confirming normal vital signs, the mother was transferred to the recovery room, and vital signs in the recovery room were normal. The patient was discharged on postoperative day 4.

Discussion:

Obesity in the general population is increasing rapidly in developed countries. In morbidly obese parturients, the incidence of caesarean sections is twice as high as in normal parturients, and the risk of gestational hypertension, preeclampsia, gestational diabetes, macrosomia, and wound complications is also increased.⁽⁸⁾ In addition, the failure rate of endotracheal intubation during general anaesthesia is high, and the risk of death due to pulmonary or cardiovascular complications is high,⁽⁸⁾ Anaesthesia methods that can be applied to a parturient undergoing caesarean section include general anaesthesia or regional anaesthesia. It is not known which method of anaesthesia is superior for obese parturients and for

super morbidly obese parturients in particular. Regional anaesthesia was given in this case because of the possibility of difficult intubation. Failure rate of endotracheal intubation for parturients is reported to be about 8 times higher than general surgery patients. Regional anaesthesia is widely used in the field of obstetric anaesthesia and is the most commonly used anaesthesia in caesarean section. It mitigates the risk of general anaesthesia and related potential complications such as failed tracheal intubation and aspiration.

Regional anaesthesia for caesarean section includes epidural anaesthesia and spinal anaesthesia, as well as continuous spinal anaesthesia and combined spinal-epidural anaesthesia. The most common method for caesarean section is spinal anaesthesia; the advantage is that the neuraxial block is rapid and intense. When using spinal anaesthesia, a small amount of local anaesthetic is used, so that the fetus is less likely to be exposed to the drug, and the risk of systemic toxicity of the local anaesthetic to parturients is also low. However, there are disadvantages of single dose spinal anaesthesia, including precipitous hypotension, post dural puncture headache, and limited control of the sensory level. It is difficult to identify landmarks when performing regional anaesthesia in morbidly obese patients. It is also often difficult to identify the midline and to palpate spinous processes in the obese patient population. As the BMI increases, the distance to the epidural space increases.⁽⁹⁾ Therefore, spinal anaesthesia in obese patients is expected to require a spinal needle longer than the standard spinal needle. However, in most obese patients, spinal and epidural anaesthesia has been successfully performed with standard length needles.⁽¹⁰⁾ Spinal anaesthesia for caesarean section is generally safe for both the mother and fetus but can often result in maternal hypotension. Reducing the dose of local anesthetics for spinal anaesthesia reduces the frequency of hypotension. In this case, hypotension (80/48) occurred after induction and managed with Mephantamine 6mg. The dose of bupivacaine needed for spinal anaesthesia for caesarean section is less than that needed for non-pregnant. Spinal anaesthesia during caesarean section provides a strong nerve block, but there is a risk of conversion to general anaesthesia with prolonged

surgery. In this case, the nerve block was well maintained until the end of the operation, and no additional anaesthesia was needed. However, the possibility of prolongation of the operation time due to the macrosomia and difficulty in surgical procedures during the caesarean section of obese patients should be considered in terms of epidural anaesthesia and combined spinal-epidural anaesthesia. Although obesity in the general population and consequently, the incidence of obesity in the obstetric population is rapidly increasing, there is no established strategy for selecting a method of anaesthesia in patients with morbid obesity (BMI 40 kg/m² or more). For this reason and considering the amount of bupivacaine used for spinal anaesthesia, we wanted to share our experience with spinal anaesthesia for caesarean section in a super morbidly obese parturients.

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