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Case Report

Anesthesia management of superobese pregnant patient under spinal anesthesia in cesarean section

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ABSTRACT

Morbidly obese parturient requires specialized anesthetic care for safe labour and delivery. Regional anesthesia is considered safer than general anesthesia for cesarean section in super morbid obese parturient. We present this case to discuss anesthetic challenges associated with regional anesthesia and our approach in successful management of cesarean section in super morbid obese parturient.

1. Introduction

The anatomical and physiological changes of pregnancy along with complications associated with obesity like Gestational diabetes, pre-eclampsia, obstructive sleep apnoea (OSA), cardiac disease etc makes such parturient a particularly high-risk population.[1] WHO has classified obesity as class 1 for BMI (30–34.9 kg/m^2), class 2 for BMI (35–39.9 kg/m^2) and class 3 (BMI > 40 kg/m^2).[2] Class 3 obesity is further stratified into morbid obesity BMI (40–49.9 kg/m^2), super obesity (BMI 50–59.9 kg/m^2) and super-super obesity (BMI ≥ 60 kg/m^2). We present a case of superobese parturient (BMI-54kg/m^2) who underwent caesarean section successfully under spinal anaesthesia. Anaesthetic challenges in superobese parturient include technical difficulty in neuraxial anaesthesia, difficult airway management, availability of proper size equipment, management of associated co-morbidities and postoperative care.

2. Case Report

We report a case of 31 years old (height 155 cm, weight – 130 kg, BMI -54.1kg/m^2) superobese primigravida with 32 weeks of gestation with Gestational Diabetes Mellitus and severe pre-eclampsia posted for Emergency LSCS in view of non-reassuring Non- Stress Test.

Parturient was referred to our hospital with raised B.P 170/110 mm Hg, headache, generalized swelling and was treated with tablet labetolol 100mg twice daily since 2 days. She had recently recovered from Dengue infection and was treated for severe anemia with blood transfusion. She had cardiac evaluation for Grade 3 dyspnea and generalized edema which was attributed to morbid obesity, anemia, and preeclampsia. On Investigation, ECG and 2D Echo were within normal limits. On fundoscopy no papilledema was seen. She was recently diagnosed with Diabetes Mellitus which was controlled with fixed dose insulin. She also gave history of snoring, and she preferred sleeping in lateral position indicating Obstructive Sleep Apnea and was not any oxygen therapy. USG showed a live fetus of 31 weeks and 5 days with transverse presentation. Non stress test (NST) was non- reassuring, decision was taken for

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Emergency LSCS. On examination, we found patient had difficult airway with Mallampatti grade 3 with heavy jaw, short neck, mouth opening was adequate with normal neck movements (Figure 1). Her neck circumference was 40 cm. Generalised body oedema with bilateral pitting edema was present. On Spine examination, spinous processes were not palpable due to edema and fatty tissues. Detailed Laboratory investigations done included Hemogram, Renal function tests, Liver function test with coagulation profile which showed normal PT/INR ratio and platelet count of 2.14 lakh/microliter and all other values were within normal limits.

Fig. 1: Superobese parturient with difficult Airway

Operating room was prepared with difficult airway cart with video laryngoscopes and difficult airway equipment, long spinal needle, large wedge and drugs as per body weight. Our plan A of Anesthesia was regional anesthesia with epidural and spinal anesthesia, Plan B was Spinal anesthesia with additives. Our plan C was General Anesthesia in case of failed regional anesthesia. Preoperative aspiration prophylaxis Inj Metoclopramide 30 mg iv and Inj. Pantoprazole 40 mg iv was given. Adequate blood and blood products were arranged. After confirming adequate NBM and informed consent, parturient was shifted to OT in left lateral position and transferred to OT table safely. ASA standardized monitors like ECG, NIBP with extra-large B.P cuff, Spo2 were attached. Preoperative vitals were HR-88/min, BP-150/90mmhg, Spo2-98% on room air and preop BSL was 110mg/dl. Two wide bore 18 G iv access taken, and RL started judiciously. Under aseptic precautions painting and draping was done in sitting position. Standard 18 G Tuohy's epidural needle 8cm in length was tried at two different levels including L1-L2 space but it fell short of length. Then, the decision to proceed with Spinal anesthesia was taken. At L4-L5 spinal space, 25 gauze Whitacre long spinal needle of 120 mm length used (Figure 2) and subarachnoid space was reached at approximately 9.5 cm distance from tip of needle. Inj.Bupivacaine heavy 0.5% 2CC with Inj.Fentanyl 10mcg was given after confirming free flow of CSF. Parturient was made supine and wedge was given to avoid supine hypotension. Sensory T6 level was achieved and surgery started, baby delivered with APGAR score 9. Baby was shifted to NICU for observation. Intraoperatively strict and vigilant monitoring was done for IV fluids, blood sugar, Vitals, Blood loss and Urine output. Intraoperatively, patient was hemodynamically stable and surgery completed uneventfully in 45 minute. Patient was shifted to recovery and vigilant monitoring was done post-operatively. Postoperative analgesia was provided with paracetamol 1gm intravenously. Patient was started on Inj clexane 0.6 ml subcutaneously for thromboprophylaxis 12 hours after surgery. Patient postoperative course was uneventful.

Fig. 2: Long spinal needle

3. Discussion

Morbidly obese parturients are at increased risk for antenatal comorbidities, longer first stage of labor and cesarean delivery.[3] Many studies showed that there is increase in risk for maternal mortality and morbidity in obese parturient due to anesthesia related complications.[4,5] Proper planning with early involvement of anesthesiologist, and vigilant postoperative care constitutes important part in managing obese parturient. Spinal anaesthesia is considered as choice of anaesthesia for caesarean delivery as it provides dense block, fast onset with good surgical condition avoiding complications of General Anaesthesia. Important concerns in giving General Anesthesia in superobese parturient are difficult mask ventilation, rapid desaturation during apnea period, difficult intubation, increased risk of pulmonary aspiration, thromboembolism, and postoperative respiratory failure. Neuraxial anaesthesia can be difficult in obese parturient, but it is preferred over General Anaesthesia as it avoids airway manipulation, prevent fetal exposure to volatile anaesthetic, and decreases risk of post-partum haemorrhage from volatile anaesthetic exposure.[6,7] However, Regional Anaesthesia can be challenging in obese

parturient due to difficulty in positioning, identifying spinal spaces, failed or inadequate action, chances of high spinal block, hypotension and postdural puncture headache. We faced several challenges like difficult iv access, transferring of the patient, identification of spinal space, availability of proper sized spinal needle, deciding the dose of local anesthesia etc. The dose requirement of bupivacaine needed for spinal anaesthesia for caesarean section is less than that needed for non-pregnant due to low CSF volume and increased sensitivity to local anaesthesia in pregnancy. Carvalho B. et al[8] in their dose response study using a single-shot spinal technique in morbidly obese patients undergoing caesarean delivery suggested that doses of intrathecal bupivacaine less than 10 mg may not adequately ensure successful intraoperative anaesthesia and even when the initial block obtained with a low dose is satisfactory, it will not guarantee adequate anaesthesia throughout surgery. There is little data available on safe and adequate dose of Bupivacaine for spinal anaesthesia for caesarean section in Superobese parturient. We decided a dose of 10 mg of hyperbaric 0.5% bupivacaine with 10 mcg of fentanyl in our case and we were able to achieve adequate anaesthesia for surgery without complications like profound hypotension and high spinal block.

Our plan A of anesthesia was Epidural with spinal anesthesia in view of the possibility of prolongation of surgery due to obesity. In our case, Epidural Tuohy needle 8 cm fell short to reach epidural space even at L1-L2 and T12-L1. Due to Emergency situation, we were not able preoperatively do ultrasound scan to know the distance and orientation of spinal and epidural space. However, we had Whitacre spinal needle 25 G 120 mm long spinal needle through which we were able to reach the subarachnoid space at an approximate depth of 9.5 cm in first attempt. One of our main concerns was that in case if surgery gets prolonged due to technical difficulty, it would have been difficult task to give general anesthesia. Our experienced obstetricians were able to successfully deliver the baby and completed surgery under SAB anesthesia in spite of surgical difficulties.

BMI has a significant influence on average skin to lumbar epidural space distance (STLESD) in obstetric population. Estimated distance is shown around 8cm (7-9 cm) in parturient with BMI > 40kg/m^2.[9,10] This distance is significant in superobese parturient (BMI > 50kg/m^2) as reaching epidural space with routine epidural needle becomes extremely difficult. Our experience also showed that this distance was more inspite of little or no needle inclination with midline approach. We suggest that preoperative scanning with Ultrasound can help in locating lumbar epidural spaces and distance which can reduce multiple trials and needle pricks. Long spinal needles Quincke's bevel end 25G,20G,22G of length ranging from 120mm, 150 mm, 178mm and Whitacre pencil tip needle-21G, 22G, 25G, 26G, 27G of length varying from 145mm, 185mm, 103mm, 120mm are commercially available in India. Long Epidural needles are available in length of 9cm,10cm,12cm and 15cm. CSE sets are also available with standard 8cm Tuohy's needle and long spinal needles 25G, 27G of length 118mm, 128mm. We recommend long spinal needles and CSE sets should be easily available and kept in institutions for managing special cases of super morbid obese patients thus making anesthesia safe for patients. Experienced Anaesthesiologist with detailed preparation, team effort and vigilant postoperative care is vital for successful management of Super morbid obese parturient.

4. Conflict of Interest

None.

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