Indian Journal of Clinical Anatomy and Physiology 2024;11(1):101–103

Content available at: https://www.ipinnovative.com/open-access-journals

Indian Journal of Clinical Anatomy and Physiology

Journal homepage: https://www.ijcap.org/

Case Report

The impact of ultrasound- guided neuraxial blockade on anaesthetic outcomes in morbidly obese parturients: A case report

Charu Sharma[1]*, Jyotsna Bhargava[1], Rajiv Lochan Tiwari[1], Ritu Sharma[1]

[1]*Dept. of Anaesthesiology, Fortis Escorts Hospital, Jaipur, Rajasthan, India*

ARTICLE INFO

Article history:
Received 06-12-2023
Accepted 11-01-2024
Available online 26-03-2024

Keywords:
Parturients
Caesarean section
Morbidly obese
Body mass index

ABSTRACT

Obesity being a global epidemic is increasing in parturients nowadays, leading to super morbid obese parturient undergoing caesarean section. Caesarean section in morbidly obese poses many anaesthetic challenges under general anaesthesia a well as neuraxial anaesthesia. We report a case of super-super obese parturient with body mass index (BMI) of 63kg/m^2 who underwent elective caesarean section under combined spinal epidural anaesthesia with ultrasound guidance successfully. We aim to highlight the anaesthetic considerations and implications associated with such patients.

1. Introduction

Sedentary lifestyle and unhealthy dietary habits are the leading causes of obesity worldwide. On the basis of BMI, World Health Organization classify obesity as, Class 1- 30.0 to 34.9 kg/m^2, Class 2- 35.0 to 39.9 kg/m^2 and Class 3 ≥ 40 kg/m^2.[1] Class 3 obesity further classify as morbid obesity (BMI 40 to 49.9 kg /m^2), super obesity (BMI 50 to 59.9 kg/m^2) and super-super obesity (BMI >60 kg/m^2).[1] Obesity is associated with several comorbidities like hypertension, diabetes mellitus 2, stroke and coronary artery disease, congestive heart failure and pulmonary embolism. Obese parturients have a higher risk of obstetric complications like gestational diabetes, pre-eclampsia, eclampsia and macrosomia leading to need of caesarean delivery.[2] There are increased anaesthetic challenges during caesarean section in morbidly obese patients like technical difficulties during neuraxial anaesthesia and airway related problems in general anaesthesia. Neuraxial anaesthesia though difficult but remains the preferred anaesthetic technique in such patients and the use of advances like ultrasonography for finding the midline and depth of epidural space is the saviour in these difficult cases.[3] We report a case of a super-super obese parturient who underwent elective caesarean section under neuraxial anaesthesia with the aid of ultrasound successfully.

2. Case Report

A 31-year-old female (height 165 cm, weight – 172 kg, BMI -63.1 kg/m^2) super-super obese primigravida with 36 weeks of gestation with hypertension posted for Elective caesarean section. She was known hypertensive from last 6 years, her blood pressure was well controlled with tablet labetalol 100mg BD. She had bariatric surgery 10 years back which resulted in 55kgs weight loss which she regained eventually over years. On examination her vitals were - pulse rate – 86/min, blood pressure was 124/76 mmHg, respiratory rate was 16/min, saturation on room air was 97%. Airway examination revealed Mallampati class III, short and thick neck and heavy breast indicating possibility of difficult intubation. All systemic examination were normal. On Investigation, CBC, PT/INR, LFT, KFT, lipid profile, HbA1C, TFT and ECG were within normal

* *Corresponding author*.
E-mail address: drcharusharma15@gmail.com (C. Sharma).

https://doi.org/10.18231/j.ijca.2024.020

limits. 2D echo revealed ejection fration of 55%, mild MR, mild TR and no RWMA. USG showed a single live fetus of 36 weeks with breech presentation. She had history of snoring and preferred sleeping in lateral position or in semi recumbent position with two-three extra pillows indicating obstructive sleep apnea but without any oxygen therapy. Our plan of anaesthesia was combined spinal epidural anaesthesia and trolley for difficult intubation (including fiberoptic device) was also made ready. She was kept nil per oral for 8 h before surgery. The patient was shifted to the operation theatre on the day of surgery, two 18 G peripheral intravenous catheter were secured. Standard monitors like non-invasive blood pressure monitoring, SPO2, ECG were attached, preloading done with 500 ml of normal saline prior to epidural insertion. Patient was made to sit with the help of two nursing staff for neuraxial placement (Figure 1). Under all aseptic precautions, painting and draping done. It was very difficult to find the midline so with the aid of ultrasonography, midline was traced successfully but the inner structures were not so clearly visible due to fat, so after compression of the skin about 1cm with the probe the depth of epidural space was found to be around 5.4 cm (Figure 2). Local infiltration of L3- L4 space and the overlying skin was done with 2ml 2% lignocaine. Combined spinal epidural set was opened and epidural space was located at 6.5 cm using 18G 8 cm Tuohy epidural needle and test dose of 3ml lignoacaine 2% with adrenaline 1:200000 given. Then 27G 138mm pencan spinal needle inserted through epidural needle and subarachnoid space confirmed after free backflow of cerebrospinal fluid and 3ml (15mg) of 0.5% heavy bupivacaine administered. After removing spinal needle from epidural needle, 20G epidural catheter was threaded and fixed 5 cm into the epidural space. Patient was immediately positioned in semi-recumbent position with 15-degree left lateral tilt, sensory T5 level achieved and surgery started. During surgery there were two episodes of hypotension which were managed by inj mephentermine IV. A 2.6 kg baby delivered with APGAR score of 8 and 9 at 1 and 5 minutes respectively and shifted to NICU, after delivery 10 IU oxytocin IV bolus given and 20 IU added in 500ml 0.9% normal saline for adequate uterine contractions. The surgery was completed in 90 minutes uneventfully. Postoperatively epidural analgesia maintained for 24 hours, thromboprophylaxis achieved with compression stockings and inj clexane 75 mg sc once a day. Patient was discharged on day 4.

Figure 1: Super-super obese parturient (BMI-63kg/m^2)

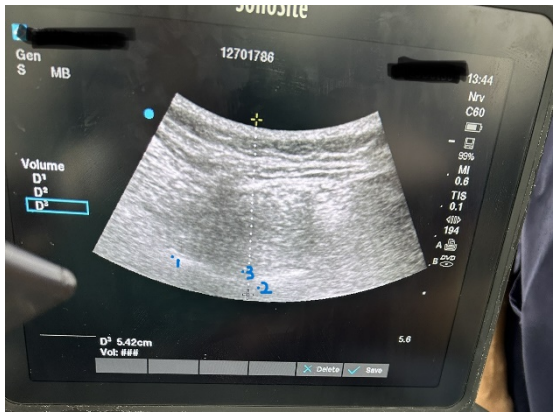

Figure 2: Ultrasonography of lumbar vertebra for midline and distance from skin to epidural space. 1-transverse process, 2-anterior complex

3. Discussion

Obese parturients are considered as a high risk population due to complications of obesity along with physiological changes of pregnancy.[1] There is increased risk for maternal mortality and morbidity in obese parturient due to anaesthesia related complications.[4] Anaesthetic considerations of the obese parturient are difficult venous access, difficult blood pressure monitoring, longer surgical time needing more anaesthesia, increased risk of gastric content aspiration, rapid desaturation, increased oxygen demand, difficult mask ventilation, difficult intubation, increased risk of supine hypotension syndrome, difficult neuraxial anaesthetic techniques. Few cases of sudden death have been reported in morbidly obese parturient on assuming the supine position due to uterine compression of large vessels along with large panniculus.[5,6] The choice of anaesthesia for caesarean section in such patients is neuraxial anaesthesia so that complications associated with general anaesthesia like difficult airway management, chances of pulmonary aspiration, reduction in functional residual capacity, increased oxygen consumption, rapid desaturation during induction, pulmonary embolism

and risk of postpartum haemmorhage due to volatile anaesthetics is avoided. However, neuraxial anaesthesia can be challenging in obese parturient due to difficulty in positioning, identifying midline, failed anaesthesia, chances of high spinal block, hypotension and post-dural puncture headache, its successful use with the aid of ultrasonography to locate the midline and depth of epidural space has been reported here. Combined spinal epidural anaesthesia offers dense and fast onset block by spinal anaesthesia and ability to extend the block in prolonged surgery and postop analgesia by epidural catheter in situ.[7,8] Immediately after positioning the catheter in epidural space, it should be secured to skin prior to changing position back to supine to reduce the risk catheter being pulled out of epidural space leading to inadequate or no effect intraoperatively.[9] Not even a single clinical trials have supported the risk of high spinal block due to use of standard dose of hyperbaric bupivacaine intrathecally in obese partuirent, so no dose reduction is advised as it may increase the risk of inadequate level of block and the need to convert into general anaesthesia intraoperatively.[1] Epiduralcatheter in situ helps in providing post operative analgesia without any respiratory complications due to use of systemic opioids.[9] Ultrasound imaging is a boon in performing neuraxial anaesthesia in morbidly obese patients by helping in identifying the midline, localizing the depth of epidural space and reducing multiple needle pricks which may be not acceptable to patient.[10] The visibility of several anatomical landmarks may be reduced during pregnancy due to fat making anaesthesiologists to compress skin 0.5-1cm with the probe for better vision because of which the actual epidural depth is 0.5-1cm more than what we get during scan. Chances of conversion from neuraxial anaesthesia to general anaesthesia is always there so anaesthesiologist should always be ready with difficult airway management if needed and the trolley of difficult airway management should always be ready in these cases prior to wheeling in the patient inside operation theatre. However, the utility of USG is well-established in such cases. Also, it is difficult to use USG if parturient is posted for emergency caesarean section or is already having labour pains, in such cases anaesthetist can try with blind neuraxial technique which may be very difficult or proceed with general anaesthesia with difficult airway management. Early use of mechanical and pharmacologic thromboprophylaxis should be initiated with early mobilization as venous thromboembolism is one of the major cause of maternal mortality and morbidity.[11]

4. Conclusion

The successful perioperative management in super obese parturients requires detailed knowledge about the peripartum implications of obesity. Procedures both GA or neuraxial blocks are usually difficult and associated with risk of complications in morbidly obese parturients. Therefore, proper preoperative planning, availability of atleast two anaesthetists and back-up plan for difficult airway management should be readily available. Ultrasonography if available should be used for neuraxial blocks to prevent multiple needle pricks and to prevent complications associated with general anaesthesia.

5. Source of Funding

None.

6. Conflict of Interest

None.

References

1. Patel SD, Habib AS. Anaesthesia for the parturient with obesity. *BJA Educ*. 2021;21(5):180–6.
2. Kominiarek MA, Chauhan SP. Obesity before, during, and after pregnancy: a review and comparison of five national guidelines. *Am J Perinatol*. 2015;33(5):433–41.
3. Balki M, Lee Y, Halpern S, Carvalho JC. Ultrasound imaging of the lumbar spine in the transverse plane: the correlation between estimated and actual depth to the epidural space in obese parturients. *Anesth Analg*. 2009;108(6):1876–81.
4. Mhyre JM, Riesner MN, Polley LS, Naughton NN. A series of anesthesia-related maternal deaths in Michigan, 1985-2003. *Anesthesiology*. 2007;106(6):1096–104.
5. Tsueda K, Debrand M, Zeok SS, Wright BD, Griffin WO. Obesity supine death syndrome: reports of two morbidly obese patients. *Anesth Analg*. 1979;58(4):345–7.
6. Drenick EJ, Fisler JS. Sudden cardiac arrest in morbidly obese surgical patients unexplained after autopsy. *Am J Surg*. 1988;155(6):720–6.
7. Saravanakumar K, Rao SG, Cooper GM. Obesity and obstetric anaesthesia. *Anaesthesia*. 2006;61(1):36–48.
8. Øberg B, Poulsen TD. Obesity: an anaesthetic challenge. *Acta Anaesthesiol Scand*. 1996;40(2):191–200.
9. Whitty RJ, Maxwell CV, Carvalho JC. Complications of neuraxial anesthesia in an extreme morbidly obese patient for Cesarean section. *Int J Obstet Anesth*. 2007;16(2):139–44.
10. Grau T, Leipold RW, Conradi R, Martin E, Motsch J. Ultrasound imaging facilitates localization of the epidural space during combined spinal and epidural anesthesia. *Reg Anesth Pain Med*. 2001;26(1):64–7.
11. D'Alton ME, Friedman AM, Smiley RM, Montgomery DM, Paidas MJ, D'Oria R, et al. National Partnership for Maternal Safety: Consensus Bundle on Venous Thromboembolism. *J Obstet Gynecol Neonatal Nurs*. 2016;45(5):706–17.

Author biography

Charu Sharma, Associate Consultant https://orcid.org/0000-0002-8945-0635

Jyotsna Bhargava, Additional Director

Rajiv Lochan Tiwari, Director, HOD

Ritu Sharma, Additional Director

Cite this article: Sharma C, Bhargava J, Tiwari RL, Sharma R. The impact of ultrasound- guided neuraxial blockade on anaesthetic outcomes in morbidly obese parturients: A case report. *Indian J Clin Anat Physiol* 2024;11(1):101-103.