Anaesthetic Management of a Super Morbid Obese Patient

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INTRODUCTION

'Obesity' is defined as a condition with excess body fat to the extent that health and well-being are adversely affected and uses a class system based on the body mass index (BMI), by the world health organization (WHO). Anaesthetic management of morbidly obese is challenging, as there is an increased risk of perioperative respiratory insufficiency and supplemental oxygen must be given throughout recovery period. The incidence of morbid obesity continues to grow and anaesthesiologists are exposed to obese patients presenting for various procedures.

The prevalence of obesity is on the upward trend worldwide. Obesity is a multi-system disorder, involving the respiratory and cardiovascular systems, and therefore, undergoing a surgical procedure under anaesthesia may entail a considerable risk. Thus, a multidisciplinary approach is required in treating such patients. Quantification of the extent of obesity is done using the body mass index. BMI is defined as the relationship between weight and height (weight [kg] / height^2 [m^2]).

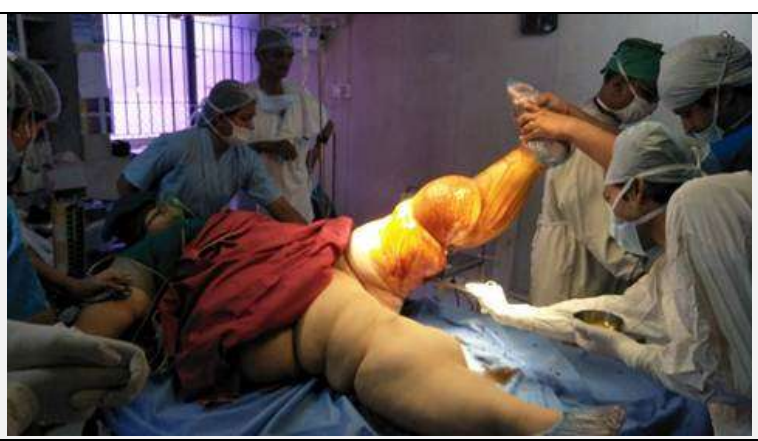

Figure 1. Super Morbid Obese Woman Posted for Excision of Left Lower Limb Lipoma

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BMI is Divided into 5 Categories

- < 25 kg/m^2 = normal,
- 25 - 30 kg/m^2 = overweight,
- > 30 kg/m^2 = obesity,
- > 35 kg/m^2 = morbid obesity,
- > 55 kg/m^2 = super morbid obesity.

With BMI >30 kg/m^2, particularly in smokers, morbidity and mortality increase sharply and the risk is directly proportional to duration of obesity.[1] 'Morbid Obesity' is defined as BMI more than 35 kg/m^2 with co-morbid conditions or 40 kg/m^2 without co-morbid conditions. BMI is the most useful among the available markers, even though BMI is not an ideal measure of risk.[2] Obesity is frequently associated with challenges during anaesthesia.

Regional anaesthesia (RA) offers many advantages in obese patients, including minimal airway intervention, less cardiopulmonary depression, improved post-operative analgesia, decreased opioid consumption, decreased post-operative nausea and vomiting (PONV), early ambulation, reduced post-anaesthesia care unit (PACU) and hospital length of stay as compared to general anaesthesia. RA is associated with improved post-operative analgesia, especially with usage of long-acting local anaesthetics or continuous peripheral nerve blocks. RA can be technically challenging in obese patients because of difficulties in patient positioning, identifying the bony and muscular landmarks and the depth of needle penetration inspite of the advantages offered by RA.

Anaesthesiologists must carefully consider the technical difficulties encountered and the limitations of RA in obese patients.

Here we report a case of super morbidly obese woman who presented for lipoma excision over left lower limb and the anaesthetic management is discussed.

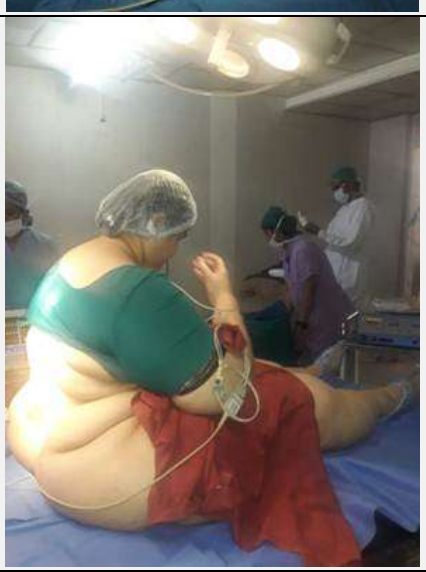

Figure 2 & 3. Posterior and Lateral View of the Patient

PRESENTATION OF CASE

A 37-year-old super morbidly obese female with a total body weight of 185 kg, height of 168 cm, (BMI = 65.5), presented with a history of swelling in left calf of 1-year duration. Patient was a known case of hypertension and diabetes mellitus since 5 years on treatment with metoprolol 50 mg once daily, nifedipine 20 mg twice daily, telmisartan 40 mg + hydrochlorthiazide 12.5 mg once daily, metformin 500 mg twice daily, rosuvastatin 10 mg once daily.

Patient gave history of undergoing two caesarean sections under subarachnoid block which were uneventful. Patient also gave history of snoring, awakening from sleep multiple times during night, morning fatigue, which are all suggestive of obstructive sleep apnoea (OSA). Sleep study could not be performed to at our centre to confirm the degree of sleep efficiency and apnoea / hypopnea index.

Examination of the lower back could not reliably show a normal vertebral column and bony landmarks due to the presence of massive fatty tissues (Fig 2 and 3). Airway examination revealed an apparently normal dentition with Mallampati classification II.

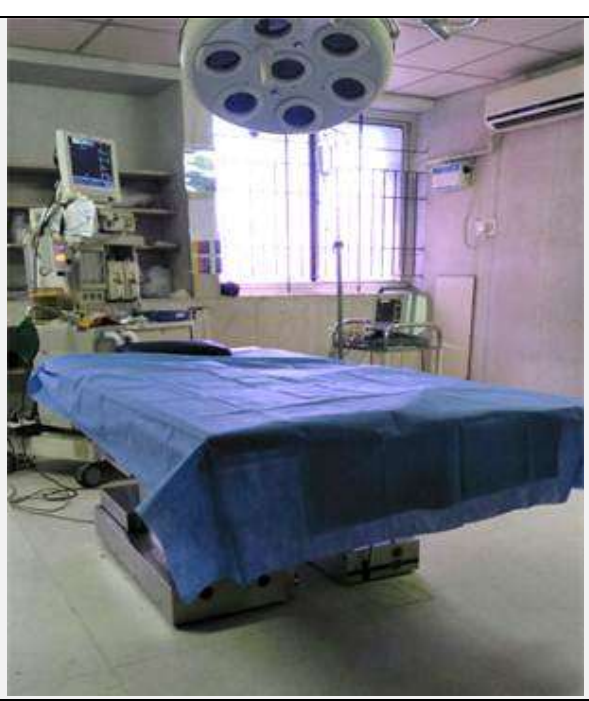

Figure 4. Two OT Tables Were Joined Together

Figure 5. 25 x 25 cm Swelling in the Left Calf

Difficulty in laryngoscopy and tracheal intubation were anticipated. The patient was classified as American society of Anaesthesiologists (ASA) physical status class III.

ECG was within normal limits. Fasting blood glucose was 156 mg/dl. All other biochemical parameters were normal. On the day of surgery, patient was advised to take her routine antihypertensive medications and rosuvastatin.

ANAESTHETIC MANAGEMENT

Due to the expected airway difficulties, regional anaesthesia was planned along with preparation for anticipated difficult tracheal intubation and ventilatory support if required. Details of the techniques chosen were discussed with the patient. Two OT tables were joined together in order to accommodate the patient (Fig 4). 18 G intravenous cannula was secured on the volar aspect of the left forearm. Standard ASA monitors such as pulse oximeter, electrocardiogram (ECG) leads, non-invasive blood pressure cuff, temperature probe, EtCO2 monitor were attached. Adequacy of mask ventilation was checked. Prior to induction of anaesthesia, baseline variables such as blood pressure of 170/90 mmHg, pulse rate of 90/min, sPO2 of 95 % on room air were recorded. 500 ml of normal saline (NS) intravenous fluid was commenced as preload.

For the induction of spinal anaesthesia, patient was positioned sitting with neck flexed and lower limbs stretched out straight (Fig 5). Under strict aseptic precautions, lumbar puncture was done at L3-4 intervertebral space with 23G BD Quincke's spinal needle and clear free flow of cerebral spinal fluid (CSF) was noted. Inj. bupivacaine (0.5 % heavy) 3.5 cc was introduced in the subarachnoid space. After injection of drug, patient was placed supine with 20^0 head up. Sensory level of T12 blockade was achieved after 5 minutes. Oxygen 5 L/min was administered via a face mask. Patient maintained stable vital parameters.

The mean arterial blood pressure (MAP) ranged between 85 to 110 mmHg with heart rate (HR) between 80 to 90 bpm. The surgery lasted 40 minutes and was uneventful. Patient was transferred with the help of 8 hospital staff directly on mobile cot as none of the trolleys could accommodate her.

Patient was then shifted to the post-operative ward in propped up position. Supplemental oxygen was given throughout recovery period. Patient was at high risk for venous thromboembolism (VTE), which was further exacerbated with high BMI and history of OSA. Post-operatively, patient was started on Inj. enoxaparin (LMWH) 60 mg Q12H subcutaneously for 72 hours for the purpose of thromboprophylaxis.

DISCUSSION

Obese surgical patients pose several challenges to the anaesthesiologists. Anthropometric changes is one of the challenge. An increased incidence of medical co-morbidities like non-insulin dependent diabetes mellitus (NIDDM), hypertension, cardiopulmonary disease, venous thromboembolism, and psychosocial disease are associated with obesity. In the treatment of VTE, total body weight (TBW) is used for the calculation of the initial bolus dose and infusion rate of anticoagulant to achieve a therapeutic partial thromboplastin time (PTT), with dosing adjusted accordingly.[3] The dose of low molecular weight heparin (LMWH) should be adjusted according to TBW.[4]

Suggestions for enoxaparin dose adjustement are as follows:

(i) BMI < 50 kg/m^2 - Enoxaparin 40 mg BID SQ;

(ii) BMI > 50 kg/m^2 - Enoxaparin 60 mg BID SQ.

NSAIDs should be used judiciously as a part of multimodal post-operative analgesic regimen, as they may increase the incidence of post-operative renal dysfunction although they are extremely effective.[5]

CONCLUSIONS

Obesity has become a worldwide pandemic. Morbidly obese patients undergoing a surgical procedure under anaesthesia pose a great challenge to the anaesthesiologist and intensive care staff. Better understanding of the pathophysiology and complications associated with obesity help to improve the outcome in obese patients.

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Disclosure forms provided by the authors are available with the full text of this article at jebmh.com.

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