

# Laparoscopic Bariatric Surgery of Super-obese Patient with Intractable Anterior Abdominal Wall Cellulitis: A Rare Challenge to Anaesthesiologist

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## ABSTRACT

Obesity has become an epidemic problem worldwide. Obesity and its related comorbidities present a variety of challenges to anaesthesiologist. Bariatric surgery is the best treatment modality for patients who do not respond to dietary restriction and medical management. An anaesthesiologist should be experienced enough to handle the airway, pain, fluid management and acidosis in the obese patients undergoing bariatric surgery. Laparoscopic vertical sleeve gastrectomy for weight loss was planned for a 48-year-old, super-obese male patient (weight 187 kg, height 155 cm, BMI 77 kg/m<sup>2</sup>) with anterior abdominal wall cellulitis which was not responding to antibiotics. On pre-operative examination, patient had a short thick neck, Grade 3 mallampati class, mild obstructive sleep apnoea and hypertension. Patient was given trial of Continuous Positive Airway Pressure (CPAP) in pre-operative period. Induction of anaesthesia was done in the semi-sitting position. Maintenance was provided with desflurane, oxygen/air mixture and dexmedetomidine infusion. However, patient had delayed recovery. Extubation was done on return of spontaneous ventilation and when patient was awake. He was initially put on CPAP and later on, reintubation was done as he was unable to maintain saturation in immediate post-operative period.

**Keywords:** Continuous positive airway pressure, Laparoscopic vertical sleeve gastrectomy, Obesity, Weight loss

## CASE REPORT

A 48-year-old male presented to Outpatient Department with complaint of weight gain, breathlessness and painful knees from past two months. Along with that he had anterior abdominal wall cellulitis [Table/Fig-1]. Laparoscopic vertical sleeve gastrectomy was planned for the patient. He was hospitalised and put on intravenous antibiotics injection piperacillin-tazobactam and metronidazole. Antibiotics continued for 10 days but cellulitis



[Table/Fig-1]: Super-obese patient.

did not respond much. During pre-anaesthetic check-up, his anthropometric measurement was weight 187 kg, height 155 cm and BMI 77 kg/m<sup>2</sup>. He was having double chin, heavy jaw, thyromental distance less than 5 cm and mallampati Grade 3. His pulse rate was 100/minutes and blood pressure was 130/80 mm of Hg. He was having orthopnoea, dyspnoea on exertion (New York Heart Association Grade 3) and significant day time somnolence with apnoea hypopnea index more than five. Breath holding time was 15 seconds. He had hypertension from past three years and was on regular medication of olmesartan 40 mg plus hydrochlorothiazide 12.5 mg once daily.

His routine investigations were: haemoglobin 12.9 gm/L; haematocrit 50; leukocyte count 11.9×10<sup>9</sup>/L; platelet count 251×10<sup>9</sup>/L; blood urea 66 mg/dL; serum creatinine 1.87 mg/dL; sodium 132 mmol/L; potassium 5.0 mmol/L; chloride 88 mmol/L; prothrombin time 16.9 seconds; INR 1.54; glycosylated haemoglobin 8.2%; total serum proteins 7.4 gm/L; differential serum protein 3.3 gm/L; random blood sugar 127 mg/dL; urine sugar and ketones nil. In chest X-ray haziness at bases was present, ECG showed sinus tachycardia. A 2D-Echocardiography seemed normal but could not be done properly because of poor echo window. Pulmonary function test showed severe restriction. His saturation at room air was 86% and arterial blood gas analysis was pH 7.4, pO<sub>2</sub> 95, pCO<sub>2</sub> 39, lactate 2, HCO<sub>3</sub> 24. Due to comorbid status of patient (breathlessness and obstructive sleep apnoea), he was taken up for surgery. Cardiology and pulmonologist consultation was sought. CPAP trial was given one day before surgery. Informed high risk consent was taken from patient prior to surgery.

On the day of surgery after reviewing consent and fasting status, patient was taken in operation theatre. A 22 gauze peripheral venous cannula was in situ on right dorsum of hand and intravenous fluid was started. Monitoring started by attaching ECG electrodes, extra large sized blood pressure cuff and saturation probe. Ultrasound guided right internal jugular vein and right radial artery was cannulated. BIS monitor was applied so as to check depth of anaesthesia and avoiding overdose. Patient was catheterised. Proper ramp position was made prior for induction as shown in [Table/Fig-2]. Preoxygenation was done for five minutes. Premedication was given inj. Ondansetron 8 mg, midazolam 1 mg and fentanyl 150 µg 10 minutes prior to induction. Intravenous induction was done with inj. Propofol 150 mg and inj. Succinylcholine 100 mg. Laryngoscopy was done and trachea was intubated with oral cuffed endotracheal tube 8.5 mm with aid of stylet. Bilateral air entry was checked



**[Table/Fig-2]:** Preoxygenation and induction in rapid airway management position.

and after confirmation of ETCO<sub>2</sub> cuff was inflated and tube was secured at 22 cm. Inj. Atracurium 40 mg was given. Orogastric tube was inserted. Patient was ventilated with tidal volume of 600 mL, respiratory rate 14/minute, PEEP 5-10 cm of water and ETCO<sub>2</sub> was maintained between 40-45 mm. Anaesthesia was maintained with 50% air, 50% oxygen, desflurane and intravenous infusion of inj. dexmedetomidine at the rate of 0.2 µg/kg body weight per hour. Sequential compression devices were applied around both lower extremities. His saturation, blood pressure, heart rate and rhythm, ETCO<sub>2</sub>, central venous pressure, urine output and blood sugar were continuously monitored throughout the surgery. After the surgery was completed, patient was ventilated with 100% oxygen. But the emergence was delayed for one hour. Inj neostigmine and glycopyrrolate was given on return of spontaneous respiration. Patient was then extubated and put on oxygen via high flow mask with SPO<sub>2</sub> 85-90%. [Table/Fig-3] shows the sequential blood gases at different intervals. In immediate post-operative period, patient was put on non-invasive mask as he was drowsy with SPO<sub>2</sub> falling below 85%. After 4 hours, he desaturated SPO<sub>2</sub> below 80% and ABG was pH 7.08, PO<sub>2</sub> 88, PCO<sub>2</sub> 113, HCO<sub>3</sub> 33.5. So the patient was reintubated and shifted to ICU and put on ventilator on volume control mode. Patient's ABG was monitored regularly and when it reached an acceptable level, he was extubated in ICU after two days and shifted back to surgery ward.

ABG	Pre-operative	Immediate	4 hrs NIV	First day post-operative	Extubation
pH	7.40	7.34	7.08	7.50	7.47
pO <sub>2</sub>	95	87	88	84	113
pCO <sub>2</sub>	39	53	113	39	43
HCO <sub>3</sub>	24.2	28.6	33.5	30.4	31.3
LAC	2.0	1.7	1.5	1.4	1.8

**[Table/Fig-3]:** Sequential arterial blood gas (ABG).

## DISCUSSION

Bariatric surgery in super-obese patients is challenging from surgical as well as anaesthetic point of view. Obesity poses difficulties in exposure of visceral fat, retracting the fatty liver, force required for instruments as well as complexity of procedures [1]. Out of all the procedures for bariatric surgery, laparoscopic vertical sleeve gastrectomy is relatively safe and effective procedure for morbid obesity [2]. Existing comorbidities make the anaesthetic management difficult. Patients should be assessed for comorbidities like hypertension, heart failure, ischaemic heart disease, diabetes mellitus, venous thromboembolism and obstructive sleep apnoea [3]. Peripheral, central venous and arterial cannulation sites should be assessed during the pre-

operative examination.

The patient was hypertensive and was on regular medication. Mild obstructive sleep apnoea was present. Pre-operative CPAP trial was given one day prior to surgery. Morbid obesity is a major risk factor for venous thromboembolism [4-6]. Therefore, 60 mg enoxaparin was given pre-operatively and sequential compression devices were applied intraoperatively. Regular operating room tables can accommodate weight of 205 kg, but we have tables with a little extra width and can bear weight upto 350 kg that was used for this patient. Blood pressure measurements can be falsely increased if a cuff too small for the arm so we used the extralarge size cuff. Anticipating difficult airway, all means of surgical airways and difficult intubation cart was ready in our operation theatre. Ramp position was made with folded blankets under chest and heads that levels tragus of ear level with sternum [7]. Particular care was taken of pressure areas and they were well padded. These patients are at high risk of aspiration and upper airway obstruction after extubation; so rapid recovery from anaesthesia is needed for early return of cough reflex and decreasing post-operative complications. Hence shorter acting drugs should be used for induction and maintenance. We preferred desflurane and dexmedetomidine. Due to low blood gas coefficient, desflurane is quickly eliminated from body and has favourable recovery profile [8,9]. Dexmedetomidine decreases the anaesthetic drugs requirement such as propofol and fentanyl, maintains haemodynamics better and causes less post-operative pain [10]. Invasive monitoring was used as it is more reliable in these cases. Complete muscular relaxation and adequate depth is crucial during laparoscopic bariatric procedures to facilitate ventilation and to maintain an adequate visualisation, manipulation of laparoscopic instruments, so we used BIS in present case. Analgesia was given inj. Fentanyl bolus 150 µg and dose of 40 µg hourly till completion of surgery. All shorter acting drugs were used for this case. All the drugs were given based on lean body weight. CPAP should be given in post-operative period in patient who is having obstructive sleep apnoea to prevent acute airway obstruction [11]. In this particular case, we gave continuous positive airway pressure via non invasive ventilation as patient had mild obstructive sleep apnoea and later when condition worsened we reintubated the patient and shifted to Intensive Care Unit (ICU).

## CONCLUSION

Surgery is a safe and viable option in management of obese patients when non surgical treatment options become unsuccessful. Pre-operative assessment and optimisation is very crucial for preventing perioperative complications. Laparoscopic bariatric surgery of this super-obese patient with intractable abdominal wall cellulitis was a real challenge that we faced. Patient was initially put on intravenous antibiotics however condition was not improved much. Later surgery was planned seeing the comorbid status of patient. This particular case could be nightmare for an anaesthesiologist who is working in a non equipped area with no ventilatory backups however our institute could do it well in pre-operative, operative as well as in post-operative period. Therefore with a detailed pre-operative evaluation, optimisation, planned anaesthetic case technique and ventilatory set up, these kind of cases where bariatric surgery was compelling indication can be managed well in hands of skilled anaesthesiologists. A good number of patients go for bariatric surgery every year and we, the anaesthesiologists, can serve our people by providing safe anaesthesia to them.

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