

CASE REPORT

Anesthetic management for super-super morbidly obese patient

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ABSTRACT

Obesity leads to several changes in both airway and drug metabolism. The problems are compounded in cases of super super morbid obesity. Gastric banding surgery for weight loss was planned for a 47 year old, super-super morbidly obese female patient (164 kg and 151 cm, BMI: 72 kg/m²). On pre-operative examination, patient had a short thick neck and grade 4 Mallampatti class. Induction of anesthesia was done in the sitting / semi-sitting position Maintenance was provided with 6% desflurane and O₂/air mixture. Remifentanyl infusion of 0.05 µg/kg was administered during surgery. Patient had an uneventful recovery. The use of short acting drugs and appropriate monitoring provided hemodynamic stability and a fast and smooth recovery

Key words: Morbid obesity; Super-super morbid obesity; Inhalation anesthesia

Citation: Erbas M, Toman H, Kiraz HA, Simsek T, Arik MK, Uyan B, Sahin H. Anesthetic management for super-super morbidly obese patient. *Anaesth Pain & Intensive Care* 2014;18(3):291-293

INTRODUCTION

Prevalence of morbid obesity is gradually increasing in both developed and developing countries.¹ Optimal method of anesthetizing morbidly obese patients is still debatable.^{2,3} Super obese is a term used to describe patients with BMI > 72 kg/m² or a weight over 200 kg. Studies related to bariatric surgery are generally performed on morbidly obese patients. Management of super obese (BMI 50 kg/m²) and super-super obese (BMI 60 kg/m²) patients are based on extrapolation of findings obtained from morbidly obese patients.⁴

The aim of this case report, is to discuss the perioperative management of a patient, defined as super-super obese (with BMI of 72 kg/m²) who had a laparoscopic abdominal bypass surgery.

CASE REPORT

Gastric banding surgery was planned for a 47 years old, super-super morbidly obese female patient (weight=164 kg and height=151 cm. BMI: 72 kg/m²). On pre-operative examination, patient had a short thick neck and grade 4 Mallampatti class. She gave a history of hypertension for the last 10 years and was non-compliant with her medication. Her respiratory function tests were as follows; FVC: 2200 ml, FEV₁:1720 ml and FEV₁/FVC: 78%. She was labeled

as ASA-III. Cardiac and respiratory consultations were requested and confirmed.

The patient was taken to the operating room and monitoring instituted, including an arterial line, electrocardiogram, and pulse oximetry. She was preloaded with 1500 ml of normal saline. She was then placed in sitting / semi-sitting position prior to induction. Various sizes of supraglottic airway devices, endotracheal tubes and laryngoscopic blades, stylet, gum elastic bougie, fiber optic bronchoscope and kit for emergency tracheostomy were prepared before induction. A bolus of 2.5 mg/kg of propofol IV (Propofol 1%, Fresenius Kabi, Istanbul), and remifentanyl (Ultiva®, Glaxo SmithKline, Istanbul) 1 µg/kg was administered for anesthesia induction after three minutes of pre-oxygenation with 100% oxygen. Since mask ventilation was possible, 0.6 mg/kg rocuronium bromide (Esmeron®, Organon, Istanbul) was administered and intubation was performed 90 seconds later. Laryngoscopy was attempted with size 3 Macintosh laryngoscope blade while the head was kept in neutral position Tracheal intubation was performed on first attempt with an 8.5 mm inner diameter endotracheal tube. Tube placement was verified by auscultation and capnography. Mechanical ventilation was adjusted to maintain a tidal volume of 8 ml/kg using a volume controlled mode, inspiration /expiration ratio of 1:2, flow rate of 3 L/min, respiratory rate of 12/min

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Table 1: Peri-operative parameters

	0 min	1 min	2 min	5 min	15 min	30 min	60 min	120 min	180 min	210 min	Extubation 240 min
MAP	105	97	95	92	95	95	90	92	94	98	102
SpO ₂	95	96	96	95	94	96	95	95	96	96	97
EtCO ₂	42	40	40	38	38	43	41	42	40	38	44
Abdominal pressure (mmHg)	14	14	13	14	14	14	13	13	13	13	

MAP: mean arterial pressure, ETCO₂: End-tidal carbon dioxide, SPO₂: Oxygen saturation

and end tidal CO₂ value of 35-40 mmHg with 6 L/min of fresh gas flow.

Anesthesia was maintained with 6% desflurane in O₂/Air mixture. Remifentanyl infusion at a rate of 0.05 µg/kg/minute was continued during the surgical operation. Hemodynamic parameters and arterial blood gas values of the patient were followed during intra/postoperative period (Table 1).

Operative time was 3.5 hours. Pneumoperitoneum was maintained for three hours. While trocar sites were sutured post-operatively, 50 mg pehtidine IV was administered, desflurane was turned off and patient received 100% O₂. Thereafter, remifentanyl infusion was terminated and 200 mg IV sugammadex was administered to reverse neuromuscular blockade. Spontaneous respiration was observed to be adequate within five minutes. Patient was extubated and 100% O₂ was administered by means of a mask at a rate of 4 L/min. After a short follow-up, the patient was taken to the recovery room and was monitored for approximately two hours after which she was shifted to the general surgery ward.

DISCUSSION

In this case we used short acting anesthetic agents such as desflurane, remifentanyl, rocuronium and sugammadex with minimum invasive monitoring. We aimed at intraoperative stability and a fast recovery.

Obesity has various effects on body system and organs; it increases the risk of cardiovascular, respiratory and liver disease and leads to various metabolic changes. Obesity is frequently related to dyslipidemia, increased basal metabolic rate, increased oxygen consumption, carbon dioxide production and diabetes; this makes the patient more prone to rapid desaturation.⁶ Morbid obesity also causes changes in distribution, binding and elimination of drugs. Since GFR and renal blood flow are both increased, drugs that are cleared and secreted by the kidneys are excreted quicker. Obesity also causes an increase in hepatic enzymes but there is no effect on hepatic clearance of drugs cleared via this route and this makes titration of the drug more difficult and unpredictable.⁷

Morbidly obese patients are at high risk with regards

to aspiration and upper airway obstruction following tracheal extubation, rapid recovery from anesthetic drugs is necessary for early return of cough reflex and to decrease post-operative complication rate.^{8,9} Therefore besides preparation of difficult intubation we preferred short acting anesthetic agents for induction and maintenance of anesthesia during surgery. Due to low solubility, desflurane is quickly eliminated from the body irrespective of anesthesia duration.¹⁰ De Baerdemacker et al¹¹ reported that fast recovery was obtained in a shorter time in morbidly obese patients administered desflurane-remifentanyl when compared to patients administered sevoflurane-remifentanyl anesthesia. Moreover, general hemodynamic control is better when desflurane is used. Juvin et al reported that post-operative recovery was of shorter duration and use of desflurane decreased post-operative hypoxemia.¹²

Due to its ester structure, remifentanyl is sensitive to hydrolysis by blood and tissue esterases and is metabolized rapidly and predictably, independent of renal and hepatic function. Mean half-life of remifentanyl is approximately four minutes, this results in accelerated recovery from its intense analgesic effects as well as its respiratory depressant effect but can provide hemodynamic stability. These characteristics make remifentanyl a near ideal primary intraoperative analgesic option in bariatric surgeries.¹³ We used remifentanyl infusion in anesthesia maintenance of our patient and we observed that it decreased both desflurane consumption and contributed to hemodynamic stability.

Sugammadex provides faster and safer recovery than neostigmine in terms of the effects of neuromuscular blockers (NMB) in morbidly obese patients.¹⁴ We used sugammadex for our patient in order to completely antagonize the effect of rocuronium. We observed a fast and safe recovery. Besides, we did not encounter any problem in the post-operative follow up. Following surgery we took informed consent from the patient to report the case.

In conclusion; the use of drugs with a short half-life in this super super obese patient provided intra-operative hemodynamic stability as well as a fast and smooth recovery

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