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CASE REPORTS

Preoperative Evaluation, Anesthesia and Outcome of a Super Morbidly Obese Patient

Majlinda NAÇO[1], Haxhire GANI[1], Nertila KODRA[1], Etmont ÇELIKU[2], Alma LLUKAÇAJ [2], Eden NAÇO[3]

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Abstract

Background: Nowadays anesthesia and outcome of morbidly obese patients became not only challenges but and an obligation in abdominal surgery. Sometimes morbidly obese patients postponed from all the kinds of surgery till it is life-threatening. The ward of anesthetists is obligate for a very careful preoperative evaluation, anesthesia, and outcome of morbidity obese patients. These include the preoperative evaluation of obesity, particularly on cardiac, respiratory, and metabolic systems; airway management; perioperative management (i.e., hemodynamic, respiratory, and hyperglycemic) and postoperative care.

Case description: A 62 years old female with BMI=63.7 kg/m² with severe hypertension treatment came to a surgery ward for the plastic abdomen. After a careful preoperative preparation for the respiratory system and prophylaxis for thrombosis home, we started preoperative care 72 hours before surgery done in our hospital. We used general anesthesia for operation, the surgery lasts 190 minutes, and the patient was extubated according to weaning criteria only 16 hours after surgery. The patient stayed 2 days in intensive care and left a safe hospital on her ten days of recovery.

Discussion: Super obese surgical patients represent numerous challenges to the anesthetist.

Conclusion: A better understanding of the pathophysiology and complications that accompany obesity may improve their care and outcome.

Introduction

As we know the obesity is called the disease of the century according to World Health Organization. Overweight affects more than 13 % of the global population as a common nutritional disorder[1].The prevalence of obesity in USA will be increased maybe till 50% in 2030 if the style of life is the same.[2] This is a problem nowadays not only in over the world but it became and in our country. 18.1% of Albanian people suffer from obesity according the latest news of 2014-t from CIA World Fact Book.With obesity comes a variety of other interconnected diseases including cardiovascular disease, diabetes, and fatty liver disease, which makes the disease one of the most difficult and most crucial to treat. We know that to value obesity we get used to calculate BMI in our clinical practice. BMI or index of body mass is determinant in weight of a healthy person and to estimate the degree of obesity{our weight in kg divided to our height in square(kg/m2)}. BMI 30 kg/m2 is defined obesity, BMI 40 kg/m2 is defined morbid obesity, BMI 50 kg/m2 is defined super obesity, BMI 60 kg/m2 is defined super-super obesity.[3] Obesity according to WHO is an increase of adipose tissue and is a centralplayer in the pathophysiology of chronic diseases(diabetes mellitus, insulin resistance, dyslipidemia, hypertension and atherosclerosis) because of its secretion of excessive adipokines. Obesity almost is a main reason of the metabolic dysfunction. According to literature, obesity contributes to immune dysfunction from the effects of its secretion of inflammatory adipokines and is a major risk factor for many cancers.[4] The preoperative evaluation of obesity should perform to assess and estimated

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* ***Corresponding author:***
Asc. Prof. Dr. Majlinda Naço, MD, Ph.D.
✉ *majlinda_naco@yahoo.com*

1 *Department of Anesthesia and Intensive Care in General Surgery, University Hospital Center "Mother Theresa",Tirana, ALBANIA.*
2 *Department of General Surgery, the first clinic, University Hospital Center "Mother Theresa", Tirana, ALBANIA.*
3 *Medical student, Catholic University "Our lady of good counsel", Tirana, ALBANIA.*

the risks with the patient, familiar and surgeon. The visit should be with medical history and clinical report, physical exam, different pharmacokinetic and pharmacodynamic drug regimen and clinical testing.Morbidly obese patients suffer to many clinical conditions that can affect anesthesia. Of major concern to the anesthetist are difficulties with airway management and abnormalities of cardiorespiratory function. Safe anesthesia requires an appreciation of potential problems and a thorough understanding of the pathophysiological changes that accompany morbid obesity. Postoperative care, as well as anesthetic management of coexisting disease states of obesity patient are mandatory for the future history.

Case report

A patient 62 years old female total body weight 153 kg, with a height of 155cm with BMI=63.7 kg/m² (obese class III) was admitted to consult to our surgery ward complaining for uterine bleeding after menopause and abdomen decubitus view and a belly hanging up to the knee. She had severe hypertension for which she had been on treatment for more than 12 years with Menartan 40mg, Nebilet 5mg daily, Moduretic 5mg/50 mg daily and low dose aspirin 100mg daily. Further history revealed over five years of witnessed snoring, relative difficulty staying awake during the day, choking and coughing bouts at night, awakening from sleep multiple times during the night, and morning fatigue suggestive of obstructive sleep apnea. Airway examination revealed an apparently normal dentition and Mallampati classification IV. Following inadequate thyro-mental and sterno-mental distances and, an excessive breast mass difficulty in laryngoscopy and tracheal intubation were anticipated. The patient was classified as ASA physical status Class IV. The electrocardiographic findings were normal and cardiac ultrasound it was difficult to her weight, was almost normal with EF=52. Fasting blood glucose on

Figure 1.

Figure 2.

the morning of surgery was 6.5 mmol/L.X-rays of lungs and pulmonary spirometry was normal. Arterialsaturation of O2 on air was 96%. In auscultation of her lungs were absent of respiratory wheeze at rest. All the other biochemical parameters were normal. The tumor marker analysis were in normal border, so the patient give the consensus for plastic surgery after we explained her risk mortality 1.1–1.5% from anesthesia, according to her data. In figure nr1 e 2 we can see the abdominal decubitus view of patient.

After a careful preoperative preparation for respiratory system with bronco dilatator, expectorant mycotilic and prophylaxis for thrombosis home we started preoperative care 72 hours before surgery done in our hospital. First of all we establish a vein for our patient, but in the condition that it´s almost impossible for peripheral access, we put as venous accessanInternal Jugular Vein Central. After that we started prophylaxis with Ceftriaxone 2gr, Omeprazole40mg, EnoxaparinOn the morning of surgery she had her routineamlodipine and atorvastatin tablets only and weared elastic stocks on her legs**.**

We planned to use general anesthesia for operation. Two laryngoscope blades nr 4 with short barrel handles,a videolaryngoscopeset with blade No 4,a cricothyrotomy set, and laryngeal mask airway were made ready for anticipated difficult airway instrumentation and access. Following the expected airway difficulties, we were fully prepared for tracheal intubation afterlying patient inRamping position. We ventilated patient with 7liter O2 for about 15 minutes before started induction.We monitored patient with pulseoximetry(SpO2) electrocardiogram (ECG) continuously, non-invasiveblood pressure monitor(NIBP), body temperature and urine output through bladder catherization. We intubated patient after induction of anaesthesia with propofol 1mg/kg, fentanyl 5 µg/kg , Suxamethonium 1, 5 mg/kg in first attempted with direct laryngoscope with tracheal tube with a stylet 7.5 mm.

Anaesthesia was maintained by controlventilation with closed circuit with a tidal volume of 4ml/kg , respiratory rate of 14/min and PEEP 5 cm ,with 0.8l/O2 and 0.2 l of air, fentanyl 2 micrograms/kg every 30 minutes, 0.25mg/kg of atracurium initially and 10 micrograms/kg every 20minutes as maintenance dose.(figure nr3)

Figure 3.

Inhalational anaesthesia was carried out with sevoflurane. After induction thepatient was ventilated until MAC value reached 2. The operation started at this value. During all surgery patient had adequate ventilation and oxygenation and was hemodynamically stable. The operation lasted 190 min. (Fig.4& 5)

Figure 4.

Figure 5.

After surgery the patient was transport to the post anesthesia care unit with 30-40% oxygen supply to prevent transient hypoxemia. We monitored again SpO2, ECG, NIBP every 15 min., body temperature with temperature-sensitive strip and used a forced –air warming device . We monitored during all the time her urine output. Arterial blood gas measurements could perform every hour. Oxygen therapy should be carefully controlled in supper obese patient. She was put with a 45° head-up tiltposition. Ventilation was controlled by V-SIMV with a tidal volume of 4ml/kg, respiratory rate of 14/min and PEEP 5 cm, with FiO2-60% according to arterial blood gas (ABG).

Opioid analgesia was not avoided in the first 12 hours postoperative period. During all the time we kept sedation with Propofol,Fentanyl, Midazolamin continuous devices till she was fully awaked. She was extubated according to weaning criteria only 16 hours after surgery. She started immediately enteral food.After that she received only intravenous paracetamol 600 mg 6 hourly for 48hours, and later she received no steroidalanti-inflammatory drugs alone according to her pain. She also received enoxaparin 60 mg 12 hourly for 96 hours and encouraged for early mobilization.She was however discharged from the hospital onthe 11th day postoperative.

Discussion

Obese surgical patients represent multiple challenges to the anesthetist. Obesity is also associated with an increased incidence of medical co-morbidities; including noninsulin dependent diabetes, hypertension, anddecrease in sleep efficiency associated with sleep apnea, cardiopulmonary disease, venous thromboembolism, and psychosocial disease. [5,6]Hospital costs are also higher inobesity, with increased risk of perioperative morbidity and mortality [7]. An individual who has 30% excessive weight has a 40% increased mortality risk due to heartdisease and a 50% increased mortality risk due to stroke. According to ASA Physical Status Classification System; patients with 30 < BMI < 40 are classifiedas ASA II,patients with a BMI ≥40 are classified as ASA III [8].InTable 1 we represent according to Demaria Validation of the Obesity Surgery Mortality Risk score.[9].

Obesity Surgery Mortality Risk Stratification score: risk factors;

Risk factor	Score
BMI ≥50 kg/m^2	**1**
Male	**1**
Age>45 years	**1**
Hypertension	**1**
Risk factors for pulmonary embolism*:	**1**

**Pulmonary hypertension, previous pulmonary; thromboembolism; vena cava filter; hypoventilation ($PaCO_2$≥45mmHg).*

Risk ofmortality

Table 1.

Class A: 0-1 points	**0.2–0.3%**
Class B: 2–3 points	**1.1–1.5%**
Class C:4–5 points	**2.4–3.0%**

Our patient hadrisk factor score 3 that mean risk mortality wasClass B: 2–3 points=1.1–1.5% and was classified as ASA III.She had a BMI of 63.7 and had been on treatment for severe hypertension.

Preoperative assessment by anesthesiologist should include the presence of hyperglycemia, hyperlipidemia, hypertension, coronary artery disease, respiratoryproblems, liver disease, and obstructive sleep apnea (OSA). As per indicated surgicalprocedure, impacts of osteoarthritis should be considered regarding positioning of patientespecially during elective surgery [10]. Our patient denied all medical problems. The laboratory data was almost in normal value. Factors increasing perioperative risks in obese patients in terms of airways and pulmonary systeminclude airway anatomy, rapid desaturation developed during anesthesia induction secondaryto reduced functional residual capacity (FRC), tendency to desaturation in supine position, needfor induction and recovery in vertical position, tendency to sleep apnea, chronic respiratoryinsufficiency, pulmonary hypertension, predisposition to deep venous thrombosis and its consequences, and need for active participation to encourage for postoperative mobilization [11].Obesity is a common and important risk factor for obstructive sleep apnea (OSA). Sleep apnea in obesepatients has usually obstructive character and originated from airway stenos is secondary toexcessive amount of per pharyngeal adipose tissue and from reduction of upper airway muscletonus during rapid eye movement (REM) sleep. BMI, neck diameter, lung function tests(LFT), arterial blood gas measurement during daytime room air, and sleep-related complaintscould not adequately predict the presence and severity of OSA in obese patients [12].Airway assessment Obesity is associated with a 30% greater chance of difficult/failed intubation; although predictors for difficultlaryngoscopy are the same as for the non-obese [13].A large neck circumference is a useful additional indicatorand when greater than 60 cm, is associated witha 35% probability of difficult laryngoscopy [14]. In our patient theneck circumference was 58 cm and we realized the intubation on first attempt with Ramping position.[15] We noted no problem during maintain of anesthesia.Immediate post-anesthesia care for super obese patient aimed to prevent from respiratory dysfunction, hypothermia, hemodynamicinstability, thromboembolism, PONV, and pain [16, 17].Full monitoring should be maintained in the postanesthesia.care unit (PACU). The patient should bemanaged in the sitting position or with a 45° head-up tilt.

Oxygen therapy should be applied to maintainpre-operative levels of arterial oxygen saturation andshould be continued until the patient is very active.Obesity is a risk factor for thromboembolism, where prophylaxis is recommended in all surgicalinterventions. Low-molecular-weight heparin is recommendedfor prophylactic purposes [17].The incidence of postoperative nausea-vomiting is the same according to Appfel score[18].An effective postoperative pain management is important to prevent pulmonary complicationsand provides sufficient respiratory depth. Pain management through intramuscularroute is not recommended in obese patients. Opioid-induced upper airway obstruction andrespiratory depression are more likely to be seen in obese patients with obstructive sleepapnea. When deciding postoperative analgesia in obese patients, selecting a multimodal analgesiamethod rather than a single method will provide more effective pain control andavoidance of potential complications [16,17,19].

Conclusion

Obesity is no longer adisease of rich countries, but rather a worldwide pandemic included to be present and to our country. Clearly the general anesthesia in a super morbidly obesepatient it can be an enormous challenge to theanesthetist and in PACU. A betterunderstanding of the pathophysiology andcomplications that accompany obesity may improvetheir medical care and outcome.

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Bibliography

1. 'Fat-burning' molecule has implications for the treatment of obesity Date: June 8, 2020, Source: Virginia Tech
2. World Health Organ Tech Rep Ser 2000;894; i-xii,1-253.
3. Obesity surgery 2006; 16: 1563-1569.
4. Anesthetic Challenges in the Obese Patient, Rudin Domi 1, HakiLaho PMID: 22562644, DOI: 10.1007/s00540-012-1408-4
5. Morbid Obesity--A Review, Todd A Richards 1, Alan D Kaye, Aaron M Fields, PMID: 15830765
6. The Pathophysiology of Obesity and Its Clinical Manifestations.Richard N. Redinger, MD Gastroenterology & Hepatology Volume 3, Issue 11 November 2007, pp 856-864.
7. Buchwald H. The evolution of metabolic/bariatric surgery. Obes Surg. 2014; 24(8):1126–1135. DOI: 10.1007/s11695-014-1354-3.
8. https://www.asahq.org/resources/clinical-information/asa-physical-status-classification system
9. Demaria EJ, Murr M, Byrne TK, et al. Validation of the Obesity Surgery Mortality Risk Score in a multicenter study proves it stratifies mortality risk in patients undergoing gastric bypass for morbid obesity. Annals of Surgery 2007;246: 578–84.
10. Collazo-Clavell ML. Bariatric surgery: important considerations for the primary care provider. ComprTher. 2008; 34(3–4): 159–165.
11. Vgontzas AN, Tan TL, Bixler EO, Martin LF, Shubert D, Kales A. Sleep apnea, and sleep disruption in obese patients. Arch Intern Med. 1994; 154(15): 1705–1711.
12. Koenig SM. Pulmonary complications of obesity. Am J Med Sci. 2001; 321(4): 249–279.
13. Lundstrøm LH, Møller AM, Rosenstock C, Astrup G, Wetterslev J. High body mass index is a weak predictor for difficult and failed tracheal intubation: a cohort study of 91,332 consecutive patients scheduled for direct laryngoscopy registered in the Danish Anesthesia Database. Anesthesiology 2009; 110: 266–74.
14. Brodsky JB, Lemmens HJM, Brock-Utne JG, Vierra M, Saidman LJ. Morbid obesity and tracheal intubation. Anesthesia and Analgesia 2002; 94: 732–6.
15. Laryngoscopy and Morbid Obesity: A Comparison of the "Sniff" and "Ramped" PositionsJeremy S Collins 1, Harry J M Lemmens, Jay B Brodsky, John G Brock-Utne, Richard M Levitan PMID: 15527629, DOI: 10.1381/0960892042386869.
16. Flores JC. Post-anesthetic care unit management. In Morbid Obesity: Peri-Operative Management. Alvarez AO (Ed). Cambridge: Cambridge University Press, 2004.pp. 339–346.
17. Nightingale CE, Margarson MP, Shearer E, Redman JW, Lucas DN, Cousins JM. Perioperative management of the obese surgical patient in 2015. Anesthesia 2015; 70(7):859–876.
18. Naco M.&bp"PONV prophylaxis in thyroidectomy intervention according to Apfel risk score" Number 4, Vol1, suplement4, vol1, 2019 ISSN online 2521-0327 ISSN print:2521-0319.
19. Ziemann-Gimmel P, Hensel P, Koppman J, Marema R. Multimodal analgesia reduces narcotic requirements and antiemetic rescue medication in laparoscopic Roux-en-Y gastric bypass surgery. Surg ObesRelat Dis. 2013; 9(6): 975–980.