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CASE REPORT

Anaesthesia for bariatric surgery- our experience

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Abstract

Bariatric surgery is becoming a popular choice for the treatment of morbid obesity. Laproscopy-sleeve gastrectomy is one of the most effective methods for treating patients with morbid obesity. Anaesthesiologist has a very important role to play in the management of these patients. Though the surgery involves a younger age group, perioperative period is complicated by virtue of their size and/or weight and the presence of significant coexisting diseases leading to pharmacological alterations for anaesthetic agents.

While managing 150 patients over a period of time, we have tried to form a specific protocol, using it successfully. All the anaesthetic implications are not discussed in the following article. A brief introduction of obesity and how we have tried to use a different approach successfully in managing these patients at KIMS institution is reported here.

Keywords: General anaesthesia; Morbid obesity; Laproscopy; Sleeve gastrectomy; Bariatrics

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Introduction

Because of sedentary lifestyles and altered food habits, obesity today has become a severe health problem affecting virtually the whole world. During the past 10 years, innovations in surgical techniques, such as laproscopic sleeve gastrectomy has allowed a large population the opportunity to receive treatment for their disease. It still remains a highly challenging task for an anaesthesiologist, because of the anatomic and physiological implications and pharmacological alterations associated with obesity. This stresses the importance of the anesthetic technique and of postoperative analgesia allowing for early ambulation and the ability to normally breathe and cough. It has been observed that several aspects of anesthesia for obese patients are already defined as beneficial or noxious; however, several subjects are still should be discussed and studied to

constantly improve the anesthetic management of such patients (Figure 1) so that we can offer optimal perioperative care.

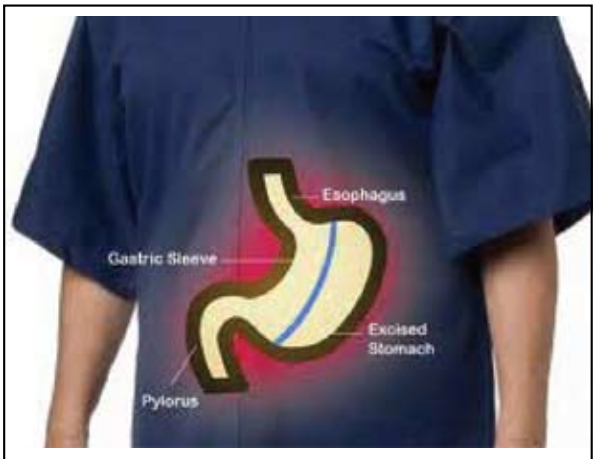

Figure 1: Depicting the gastric sleeve method

Materials and methods

Laproscopic sleeve gastrectomy was performed on 150 patients of either sex in KIMS institute. All the patients were belonging to ASA-II & III, with an age group between 22-47 years. Surgery was performed by the same surgical team and general anesthesia was used in all patients, always by the same team of anesthesiologists. Since weight loss surgery is "elective", much attention is paid to for a thorough medical evaluation and to bring all associated medical conditions under optimal control prior to surgery.

Pre-anesthetic evaluation was performed up to one week before surgery and fitness for anesthesia was given with further instructions regarding medication and NBM status. On the day of the surgery, the patients were wheeled into the operation theatre. Intravenous access was obtained with a 16 or 18 gauge intravenous cannula. Pulse oximeter, non invasive blood pressure (using large size BP cuff which encircled ¾ of the upper arm), $EtCO_2$, electrocardiogram monitors attached for intraoperative monitoring.

Patients were premedicated with intravenous injection Midazolam (3-4 mg i.e. <0.1mg/kg of TBW) and injection Ondensetron (8 mg), 10 minutes before induction. Bolus injection Fentanyl (2 µg. kg of TBW) was administered 10 minutes before anesthetic induction. Preoxygenation with 100% O_2 was done for 5 minutes. Anesthesia was induced with injection Propofol (1.5-2 mg/kg of TBW). Rapid sequence technique was used for tracheal intubation after Succinylcholine administration (2 mg/kg=TBW). After intubation a nasogastric tube was inserted to decompress the stomach and the urinary bladder was catheterized. All pressure points were adequately padded. The surgery is performed in anti trendelenberg position, patients were restrained properly to prevent slipping from operation table.

Volume-controlled ventilation was applied with FiO_2 of 0.4 to 0.6 and PEEP of 5 cm H_2O. Anaesthesia was maintained with O_2 +N_2O+sevoflurane. Carbo peritoneum was initiated and intra abdominal pressure maintained between 10 to15mmHg.

Intraoperative neuromuscular block was achieved with injection Vecuronium. Intravenous paracetamol (1 gm) and intravenous diclophenac sodium (75mg) were administered for intraoperative analgesia. The surgery was carried out in modified Lloyd Davis position (steep reverse Trendelenberg position with legs spread apart). $EtCO_2$ was maintained between 35-40 mmHg, SpO_2 between 95%-100% and blood pressure and heart rate at 20% of baseline value.

Intraoperatively a gastric boogie was pushed into the stomach at the time of sleeve resection. At the end of the procedure residual neuromuscular block was reversed with injection. Neostigmine Methylsulphate 0.04mg/ kg and injection Glycopyrrolate sulphate 0.01mg/kg. Tracheal extubation was performed when the patients showed adequate clinical signs of reversal of neuromuscular block. All the patients were extubated on operation table before shifting to surgical ICU. There was one case of delayed recovery in postoperative period, but re intubation was not done. The patients were shifted postoperatively into the surgical intensive care unit. Post operative pain relief was provided with local anesthetic wound infiltration of port site with 0.125% bupivacaine hydrochloride and intravenous Diclophenec Sodium (75mg) t.i.d./injection Paractamol (Perphalgan) 1gm t.i.d with injection Tramadol 50 mg SOS. Oral fluids were started on the next day. DVT prophylaxis with LMWH was started 6 hours after surgery and provided till the patient was discharged.

The patients were made ambulatory on 1st postoperative day and were discharged from the hospital between 3rd to 5th postoperative day.

Results

150 patients were included in this study with mean age of 39.6 years and mean body mass index (BMI) of 44.65 $kg.m^{-2}$ – BMI = weight (in kg) $height^{-2}$ (in meters). Demographics data is shown in table 1.

Table 1

Variables	*Range*
Age	22-47yrs.
Weight	105-161kg
BMI	41-60

All the patients were classified as Mallampati I, or Mallampati II. In all the cases endotracheal intubation was performed without great difficulty. The trachea was extubated in the operation theatre at the end of the surgery. Only one patient with history of OSA required CPAP in the post-operative period. one patient showed signs of delayed recovery. No post-operative complications were noticed in KIMS patients. Renal function and liver function tests were normal in all patients in the post operative period. Patients were made ambulatory on the first postoperative day and discharged from the hospital between the third and fifth postoperative day. During follow up we noticed that the patients have lost upto 40 Kg- 70 kgs of weight over period of one year. 3 patients underwent abdominoplasty and other cosmetic surgeries after one year. One patient got married and 1 patient conceived later on.

Discussion

The word obesity comes from the Latin word obesus, which means fattened by feeding [1]. Weight evaluations are related to height and gender. The ideal body weight (IBW) was determined and estimated as follows: IBW equals subtracting 100 for males and 105 for females from their respective height in centimeter [1-3]. Another criteria is lean body weight (LBW) which adds 30% to IBW due to increased muscular mass, which is concomitant to fatty tissue increase in obese people. There are currently several indices in the literature to evaluate obesity [2-3], but the most popular is BMI.

Table 2: Obesity classification

	BMI (kg/ m^2)
Normal	≤ 25
Overweight	26-29
Simple obesity	30-39
Morbid obesity	≥ 40 or ≥ 35 with comorbidies
Supermorbid obesity	≥ 50

Anaesthetic considerations for laproscopic bariatric surgery

Among several clinical problems of obese patients [1-4], the six most frequent co-morbidities of interest to anaesthesiologists are SAH, osteoarthritis, obstructive sleep apnoea syndrome (OSAS), gastroesophageal reflux (GER), diabetes mellitus (DM) and asthma in decreasing order of frequency which has to be evaluated at the time of preanaesthetic chakeups [3-6].

Peripheral and central venous access and arterial cannulation sites should be evaluated during the preoperative examination, and the possibility of invasive monitoring has to be discussed with the patient (Figure 2). Baseline arterial blood gas measurements should be done to evaluate carbon dioxide retention and provide guidelines for perioperative oxygen administration and possible institution of and weaning from postoperative ventilation.

Figure 2: Patient with obesity

The patient's usual medications, except insulin and oral hypoglycemics, should be continued until the time of surgery. As there is suspicion of difficult

airway, patients airway should be assessed property and equipment to manage difficult intubation has to be kept ready. All the investigations should be rechecked to plan for use of anaesthetic agent and perioperative medication (Figure 3).

Figure 3: Remember we should always use specialist equipment to prevent manual handling injuries

Specially designed tables are required for laproscopic bariatric surgery. Electrically operated or motorized tables facilitate manoeuvring into various surgically favourable positions. Because of steep anti trendlenberg position patients are prone to slipping off the operating table during table position changes; therefore, they should be well strapped to the operating table. Particular care should be paid to protect pressure areas, because pressure sores and neural injuries are more common in this group, especially in the super obese and the diabetic. Despite careful positioning and appropriate padding, nerve injury may still occur in this at-risk population. Pneumoperitoneum causes systemic changes during laparoscopy. Absorption of carbon dioxide can worsen hypercarbia and acidosis, which can be offset by hyperventilation. Pharmacological alterations can be done depending upon the type of the drug used as VD is different for each agent. Histological and liver function test abnormalities are relatively common in the obese, but no clear correlation has been found between routine liver function tests and the capacity of the liver to metabolize drugs -7. Renal clearance of drugs is increased in obesity because of increased renal blood flow and glomerular filtration rate (GFR) Brochner-Mortensen et al [8] documented up to a 40% increase in GFR in obese patients. Postpoperatively patients may avoid taking deep breaths because of pain. Adequate pain relief will encourage patients to cooperate with early ambulation and incentive spirometry. Patients with a history of severe sleep apnoea may require overnight observation in the intensive care unit.

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