



Obesity and the management of anesthesia

Jeongae Yoon

MSIII

The George Washington University

School of Medicine & Health Sciences

Your patient



Obesity

- Body weight 20% above the ideal weight
- Multifactorial/multisystemic condition
- Associated with increased morbidity and mortality due to stroke, CAD, and DM

- BMI 18.5 – 24.9 = normal
- BMI 25.0 – 29.9 = overweight
- **BMI 30.0- 34.9= class I obesity**
- BMI 35- 39.9 = class II obesity
- BMI 40 or greater = class III obesity (Morbid)

Comorbidities associated with obesity (I)

- Respiratory system
 - Obstructive sleep apnea
 - Obesity hypoventilation syndrome (aka Pickwickian syndrome)
 - Restrictive lung disease

Anesthesia challenge

- Respiratory syndrome
 - Difficulty in mask ventilation and ET tube placement
 - Decreased FRC
 - Increased work of breathing due to decreased lung compliance and resistance
 - Increased atelectasis in supine position
 - OHS: Extreme sensitivity to opioid → depressed ventilation

Comorbidities associated with obesity (2)

- Cardiovascular system
 - Systemic HTN
 - Pulmonary HTN
 - CAD
 - CHF
 - CVA
 - Peripheral vascular disease
 - DVT
 - PE
 - Hypercholesterolemia
 - Hypertriglyceridemia

Anesthesia challenge

- Cardiovascular disease
 - Exaggerated fluctuation of BP
 - Increased risk of dysrhythmias, MI and stroke

Comorbidities associated with obesity (3)

- Endocrine system
 - DM
 - Hypothyroidism
 - Cushing syndrome

Anesthesia challenge

- Endocrine system
 - Glucose intolerance → risk of hyperglycemia, hypoglycemia, or DKA
 - Nephropathy → electrolyte imbalance, hypertension, anemia
 - Neuropathy → autonomic dysfunction, gastroparesis, increased risk of aspiration

Comorbidities associated with obesity (4)

- **Gastrointestinal system**
 - Hiatal hernia
 - Inguinal hernia
 - Gallstones
 - Fatty liver infiltration



Anesthesia challenge

- **Gastrointestinal system**
 - Increased risk of aspiration
 - Hepatic dysfunction
 - Difficulty in drug dosing

Comorbidities associated with obesity (5)

- Musculoskeletal system
 - Osteoarthritis
- Malignancy
 - Breast, prostate, cervical, uterus, colorectal

Anesthetic challenge

- Musculocutaneous system
 - Difficulty in positioning and transporting of pts

Pre-OP phase

- Lab and tests
 - CBC, BMP, glucose, HgA1C, EKG, CXR, Sleep studies
- Premedication
 - H2 antagonist
 - PPI
 - Metoclopramide

Intra-Op phase (I)

- Vascular access and monitoring
 - One peripheral IV
 - Monitors: ASA guide line (pulse oximetry, capnography, EKG, non-invasive blood pressure with extra large adult cuff)

Intra-Op phase (2)

- Equipments
 - Bariatric bed: normal OR beds are rated for 250 lbs.
 - Wide range of airway equipments
 - e.g. Medium and large mask, several size of oral airway, ET tubes with stylets,
 - Mac 3-4, Miller 2-3, Glidescope, or flexible fiberoptic laryngoscope
 - Ramps: goal to bring the patient's chin to a higher position than the chest

Intra-Op phase (3)

- Securing airways
 - RSI
 - Due to difficulty in mask ventilation and increased risk of pulmonary aspiration
 - Agent:
 - Propofol or thiopental
 - Succinylcholine or rocuronium
 - Preoxygenation:
 - Expired O₂ level >90%
 - Possible awake intubation
 - Local anesthesia and fiberoptic laryngoscope

Intra-Op phase (4)

- Maintenance

- Agents

- Desfluraine or sevofluraine: Quick offset.
 - Dexmedetomidine: Maybe useful in pt who are susceptible to narcotic-induced respiratory depression

Intra-Op phase (5)

- Ventilation
 - Volume controlled: 500-700mL
 - Pressure controlled
 - PEEP to improve oxygenation

Intra-Op phase (6)

- Emergence and extubation
 - Residual anesthetic agents depress respiratory drive and diminish upper airway
 - When fully recovered from the depressant effects of anesthetics
 - Extubation in head-up or sitting position
 - Requires intense post-op monitoring

Post-Op phase

- Post-Op care
 - Head-up or sitting position
 - O₂ supplement (Max PaO₂ decrease in 2-3 days post-Op)
 - IS or CPAP
- Analgesia
 - Opioid: causes depression of ventilation in obese patients
 - Neuraxial or peripheral nerve block: beneficial but challenging due to loss of landmarks

Reference

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“What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?”