Obesity and the management of anesthesia

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Your patient

Obesity

- Body weight 20% above the ideal weight
- Multifactorial/multisystemic condition
- Associated with increased morbidity and mortaligy 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 (1)

- 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 atelactasis 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
  - Metoclopromide

Intra-Op phase (1)

- 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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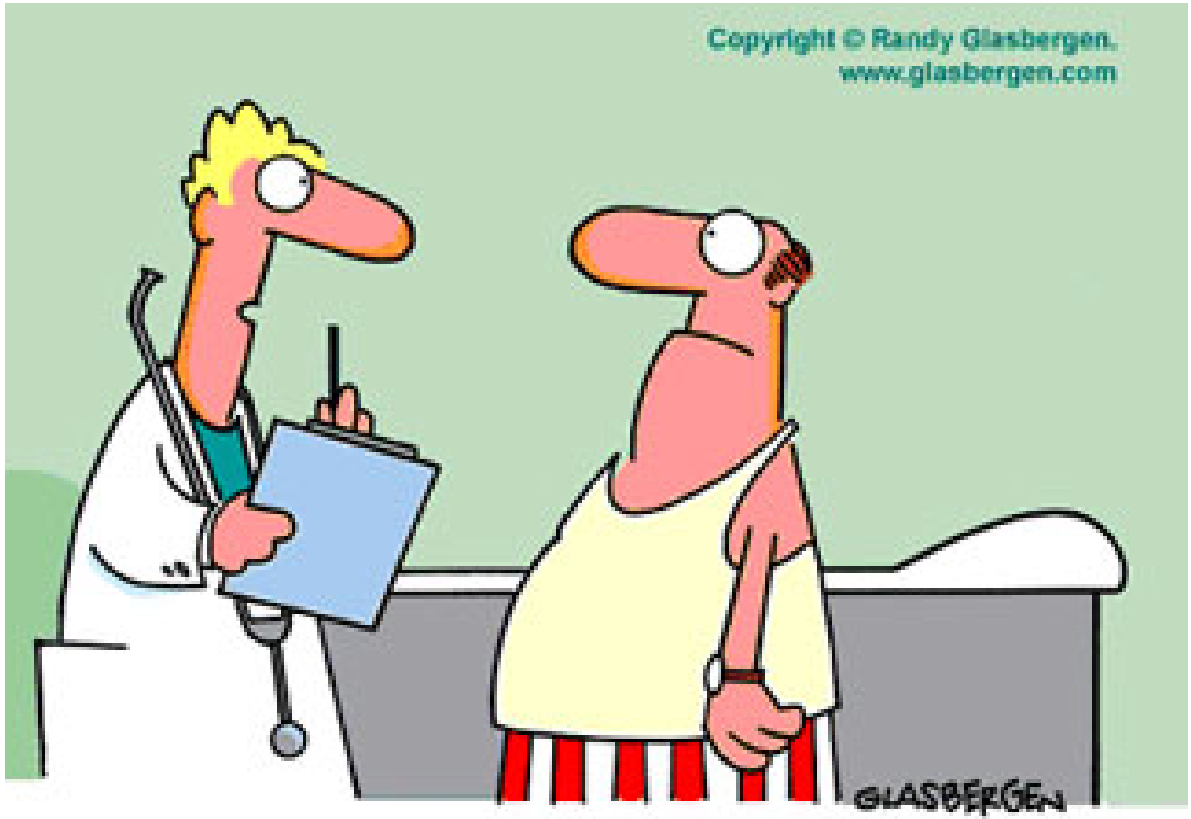

"What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?"