

THE OBESE TRAUMA PATIENT

Sue Moore, retired




DEFINITIONS AND EPIDEMIOLOGY

- Obese - BMI over 30 kg/m²
- 34.9% (78.6 million) of U.S. adults are obese
- Obesity in children is 17% (12.7 million)
 - Incidence in children is decreasing!
- Significant health effects increase as obesity increases

PSYCHOSOCIAL EFFECTS

- Few obese patients would choose to be obese
- Prejudice and discrimination by healthcare providers is well documented
- The more experienced the provider, the more prejudice
- Obese patients experience shame and embarrassment
- Consider your words
- Consider your attitude



"JUST DON'T EAT AS MUCH"


- Obese patients are insulin-resistant, whether they have or have not been diagnosed diabetic
- Because cells have difficulty absorbing glucose, they send constant signals to body that it is starving
- Obese patients who lose weight show great self discipline
- So easy to regain weight because body continues to think it is starving

AIRWAY

- Obesity is a clear predictor of difficult airway
- Excess tissue surrounding chest, neck, and face
- When supine, chin is pushed into chest
 - Trachea flexes
 - Landmarks distorted
- Pharyngeal space is smaller due to fatty tissue in tongue, tonsillar pillars, epiglottic folds

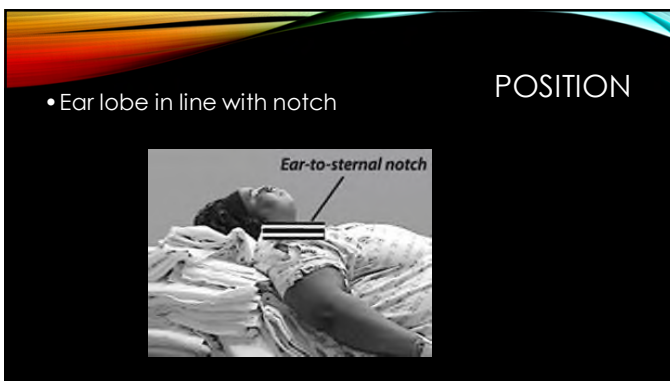
PRACTICE

- Position, position, position! In bagging as well as intubation
- Pillows under upper back and head
- If in SMR, elevate head
- Difficult to maintain seal with BVM – two-person bagging, if possible
- Be much quicker to use back-up airway
- LMA may not make good seal
- Crichothyrotomy is a nightmare
- Will desaturate much more quickly










BREATHING

- Lung volumes are decreased
 - Decreased functional residual capacity – this is what oxygenates the patient when apneic
- Chest wall compliance is decreased due to adipose in chest wall
- Abdominal contents push up diaphragm
- Frequently require increased inspiratory pressures
- HEAD UP!!!
- Thoracotomy requires needle 6 – 6.5 centimeters long

BREATHING

- Respiratory muscles are weaker – too much stretch to the sarcomere
- Patients have baseline hypoxemia, but normal ETCO2 if awake, normal respiratory drive
- Patients consumes oxygen more quickly
- Do not tolerate hypoxemia well
 - Increased metabolic needs
 - Co-morbidities
- Remember that tidal volume is based on IDEAL body weight!

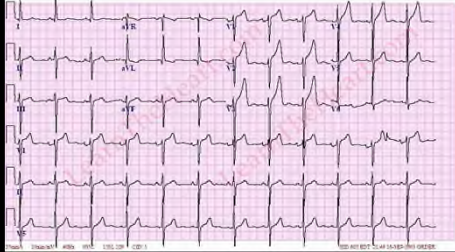


CIRCULATION

- Increased adipose tissue AND increased muscle mass; increased total circulating blood volume
- Heart rate unlikely to change until co-morbidities cause cardiac damage
- Increased cardiac output is result of increased left ventricular stroke volume
 - Left ventricular hypertrophy
 - Left ventricular failure

LEFT VENTRICULAR HYPERTROPHY

- More meat = more electricity
- R wave in AVL lead is more than 12 mm



LEFT BUNDLE BRANCH BLOCK

- QRS > 120 ms
- Monomorphic R wave in I, V5, V6




BLOOD PRESSURE

- Use appropriately sized BP cuff – if too small, reading may be higher than true BP
- If too large, readings too low
- Avoid using forearm or lower leg, if at all possible
 - No cuff is designed for anything but the brachial artery
 - Readings may be too high OR too low; unpredictable

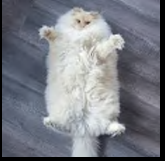
HYPOTENSION

- LV contractility is normal or above normal
 - Inotropes may not be effective
 - Dopamine at Beta dose
 - Dobutamine
 - Vasoconstrictor may be more effective
 - Norepinephrine
 - Phenylephrine
 - Epinephrine
 - Dopamine at alpha rate



DEFIBRILLATION AND PACING

- Adipose tissue does not conduct electricity well
- Consider A-P placement of defib pads
- Expect to use higher wattage when pacing



IV FLUIDS

- Left ventricle under stress, so CHF more likely
- Studies show that clinicians tend to UNDER resuscitate because they fear CHF
- Normal parameters for assessing fluid need can be distorted
 - CVP is artificially high when obese patient lies flat
 - BP cuffs are not as accurate
- Burn fluid estimates can be very inaccurate
 - Rule of 9's and "palm" methods of BSA estimates are inaccurately low, resulting in under-dosing fluids

DRUG ADMINISTRATION

- Most drug studies exclude obese patients
- Drug efficacy, toxicity, and distribution are unpredictable in adipose tissue
- Adipose delays absorption of subcutaneous injections
- Especially bad absorption of low molecular weight heparins
- Very easy to make an intending IM injection into a subcutaneous injection – beware epinephrine!

IDEAL OR ACTUAL BODY WEIGHT?

- Rocuronium should be dosed on ideal body weight
- Succinylcholine should be dose on actual body weight
- Rule of thumb – is this a titratable drug?
 - If single dose, base on actual body weight
 - If titratable, begin at dose based on ideal body weight

PATIENT AND PROVIDER SAFETY

- Get enough help!
- Remember center of gravity
- Helicopter considerations