Airway 2015

Updates in Emergency Airway Management

Gerry Maloney, DO, FACOEP
Associate Medical Director, Metro Life Flight
Attending Physician, Emergency Medicine,
CWRU/MetroHealth Medical Center

Conflicts of Interest

- None to disclose

Objectives

- Using a case-based approach, at the end of this session, you will:
  - Be familiar with current airway equipment
  - Be able to discuss the management of the difficult airway
  - Understand the various protocols for airway management, including RSI and DSI

Airway Methods

- Assumes the decision to intubate has been made
- Old school way
  - Sedative +/- paralytic
  - Direct laryngoscopy
  - Don’t bag the patient prior to intubation attempts
  - Still adequate for most intubations

Where Are We Today

- Lots of advances in airway management in recent years
- Tools to assess difficult airway
- Many flavors of video laryngoscopy
- Changes in longstanding practices
  - Uncuffed pediatric ETT
  - Cricoid pressure downplayed
  - Changes in oxygenation/ventilation during intubation

So What's the New Stuff?

- Induction
  - RSI vs DSI vs awake intubation
- Pre-oxygenation
  - Use of CPAP or high flow oxygen via NC throughout intubation
    - Passive or apneic oxygenation
- Sellick maneuver
- Video laryngoscopy
- Adjuncts for the difficult intubation
  - Bougie
  - LMA
  - King LT

Why the Changes?

- Growing body of evidence in support of newer technology
  - Video laryngoscopy
- More difficult airways
  - Many more obese patients
  - Head & neck surgery
- More elderly/chronically ill patients
  - Less able to tolerate stress of airway management

Emergency vs Elective Airway Management

- Emergency
  - You get what you get
  - Need to rapidly assess and decide best steps for success
  - Usually have limited window for success/high cost for failure
- Elective
  - Difficult airways screened in advance
  - Patients NPO
  - Ability to cancel case if needed

Case Presentation 1

- A 58 yo f pt arrives via EMS
- Was in her USOH until earlier this evening when family found her somnolent
- EMS noted her to be lethargic with pulse ox of 77% RA
- They initiated duonebs, oxygen and CPAP enroute

Case Presentation 1

- PMH is COPD and CHF
- Multiple meds, inc inhalers, lasix, spironolactone, norvasc
- VS afebrile-sats 92% on CPAP-RR28-BP 178/98
- Responds to loud verbal stimuli or sternal rub with grunts
- Poor air movement
- 2+ pretibial edema

Case Presentation 1

- CXR shows cardiomegaly and clear lungs
- ABG pH 7.18/110/88/34
- CBC/BMP/trop no significant abnormalities
- EKG sinus tachycardia no ST-T changes
- BMI is 48
- Mentation not improving on CPAP
- What to do next?

Airway Assessment

- Lots of different mnemonics
  - LEMON, MOANS, RODS, SMART
- All slightly different takes on the same issues
  - Look for signs of difficult intubation externally
  - Look for predictors of difficult ventilation
- LEMON probably best known but any will be helpful

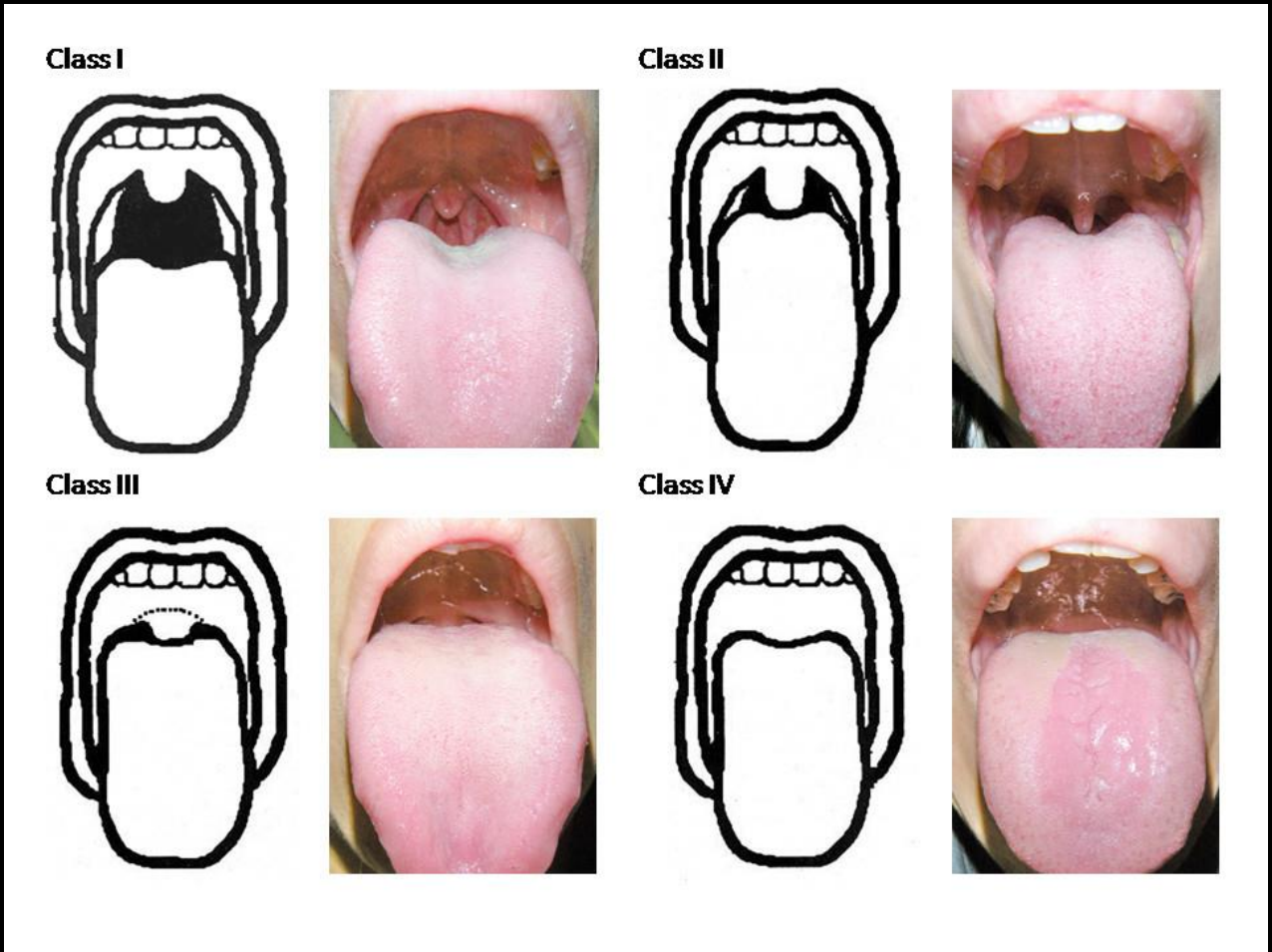
Difficult Airway Assessment

- LEMON
  - Look externally for problems
    - Obese, beard, thick neck
  - Evaluate the 3-3-2 rules
  - Mallampati Score
  - Signs of Obstruction (stridor, drooling, dysphonia)
  - Limited neck mobility (c collar, RA, Down Syndrome)

3-3-2

- Mouth able to open at least 3 finger widths
- Submental length at least 3 finger widths
- Angle of mandible to hyoid 2 finger widths
- Anything less suggests limited ability to get a blade and tube in

Mallampati



MOANS

- Predicts difficult BVM
- Mask seal
  - Beard, facial trauma, vomit
- Obesity & obstruction
- Aged patient
  - Harder to bag due to limited neck mobility, poor dentition, poor physiologic reserve
- No Teeth
- Stiff chest

RODS

- Predicts difficult placement of an alternate airway (King LT, combitube)
- Restricted mouth opening
- Obstruction of the upper airway
- Disrupted or distorted airway
- Stiff lungs/spine

Break Time

So Back to Our Patient…

- She is obese
- Already has poor reserve (marginal sats when not on cpap)
- Best view you get is Mallampati IV
- Not cooperative for mouth opening but fails the other parts of 3-3-2

Induction

- More research now focused on *not* doing RSI in high risk patients
- Alternate methods being explored
  - Delayed sequence intubation
  - Awake intubation
  - Nasotracheal intubation

RSI

- Developed from anesthesia protocols for intubating non-fasting patient
- Plan for rapid induction of unconsciousness followed by short acting paralytic to facilitate intubation
- Use of etomidate/propofol/brevital/versed and succinylcholine (SCh) standard

Risks of RSI

- Biggest risk: CI/CV
  - Can't intubate/can't ventilate
- The so-called failed airway
  - Older algorithms had gone straight to surgical airway
- Many difficult intubations also difficult crichs

The Difficult Airway

Induction Alternatives

- Pre-oxygenation
  - In addition to NRM, add high flow oxygen (15 lpm) via nasal cannula
    - Continue nc until intubated
  - Use CPAP, even during induction
  - Bag if hypoxic
  - In kids, consider vapotherm
  - In adults, consider heliox

DSI

- Focus of much recent research
- Patient who needs intubation but has some time to optimize
- Protocols vary but generally combine sedating dose of ketamine with CPAP
- Goal is maximizing hemodynamics/oxygenation/ventilation
- Examples-septic shock, status asthmaticus

Difficult Airway Tips

- Suspected difficult tube
  - Check to make sure they bag easily
  - If difficult to bag, no paralytics
  - If easy to bag, can take a look after sedation and if view is adequate can go to full RSI
  - If difficult view, use assistive devices/backup airways

Difficult Airway Tips

- Anticipated difficult tube and difficult to bag
  - No paralytics
  - Consider underlying issues to determine next best path
  - Airway obstruction consider surgical airway
  - Anatomic difficulties
    - Use video scope (glidescope/King)
    - Use backup adjuncts
      - Bougie
      - King LT/Combtube
      - I-LMA

Awake Intubation

- No paralytics
- Patient ranging from wide awake to sedation while preserving ventilation
- Can nebulize lidocaine for airway anesthesia
- If fiberoptic scope available, can use it
- After adequate prep, standard oral laryngoscopy or nasal intubation +/- laryngoscopic assist

Adjuncts

- Bougie
  - Can insert fairly blind
    - Usually just need to see arytenoids
  - Feel bumps as it bounces off tracheal rings
  - Slide tube over it

Adjuncts

- King LT/Combitube
  - Updated versions of old EOA/EGTA
  - Works on indirect ventilation
    - Cuff to occlude esophagus
    - Air thereby directed into trachea
    - Combitube had tracheal tube but frequently hard to figure out where to hook up vent
    - All are short term (a few hours at longest) solutions

Adjuncts

- LMA
  - Can use intubating or standards
  - Comes in range of sizes
  - Easy to insert
  - Can bag for short term
  - Intubating LMA-can slip ETT through after it is place, designed to direct it to trachea

Adjuncts

- Gldescope/King Vision
  - Slide in blade and look at screen, not where the blade is
  - If lots of foreign matter or airway distortion may not help as much
  - Allows for viewing cords with minimal neck movement
    - Good for trauma/unstable c spine

Crichothyrotomy

- Quick kits or home made
  - Need scalpel, trach hooks, 3.5 cuffed ETT
- Difficult if obese, neck infection, prior surgery or radiation
- Lack of experience can make this a longer than expected procedure

Special Situations

- C spine trauma
  - In line stabilization
  - Video laryngoscopy generally the least manipulation

Anatomic Airway Obstruction

- Angioedema, Malignancy, Ludwig's
  - Consider awake intubation, use nasopharyngoscope
  - Crich if easily performed
  - Blind nasotracheal intubation is fallback

Back to Our Case

- You take the CPAP off and she bags easily
- You give a sedating dose of etomidate (0.15 mg/kg) and lay her back to take a look
- A volcanic eruption of goulash and beer fills her orophaynx

Vomiting

- If significant concern for emesis during induction
  - Drop OG
  - No bagging/CPAP
  - If time permits decompress stomach
  - All pregnant women > 20 wga at risk for vomiting

Vomiting

- Turn patient lateral recumbent
- Suction vigorously
- Attempt intubation as soon as airway seems clear

Back to Our Case

- Vomit vigorously suctioned
- Video scope shows partial cord view
- Tube passed successfully
- O_2 sats maintained using high flow nasal cannula

Conclusions

- Airway management a continuously evolving field
- Difficult airways becoming more common
- Use of predictive tools can help individualize that patient's management

Questions?

- gmaloney@metrohealth.org