The Traumatic Airway

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Objectives

- Define and Recognize the signs and symptoms of a traumatic airway injury (TIA).
- Formulate a plan and resources to accomplish controlling the TAI.
- Review case studies of TAI.

Traumatic Airway Injury (TAI) Stats

- 1% of all trauma's result in TAI
- Mechanism
  - 65% Penetrating Trauma
    - 16% Mortality
  - 35% Blunt Trauma
    - 36% Mortality

Defining Upper v. Lower TAI

- Upper TAI
  - Face, pharynx, larynx and cervical trachea
- Lower TAI
  - Thoracic trachea and main stem bronchi

Size Up

- Begins before touching the patient
  - Mechanism of Injury
  - Talking to your patient may provide clues
- Airway care is a continuum
  - Simple to advanced airways
- May change at any time

Mechanism

- Blunt Trauma
  - “throat chops”
  - Steering wheel
  - Bat
  - Falls
- Penetrating
  - Stab wounds
  - GSW
  - Foreign objects

Airway First ?

- Use manual maneuvers to open airway first
  - Use spinal precautions if indicated
- If the patient has catastrophic hemorrhaging, stop the flow of blood prior to airway control
  - Direct pressure
  - Tourniquet

What are we looking for?

- Subcutaneous Emphysema # 1 S/S
- External Bleeding
- Air Escaping
- Stridor or Snoring
- Hoarseness
- Unstable mid-face trauma
- Obtunded

Other findings indicating a difficult airway

- **L** Look externally
- **E** Evaluate the 3-3-2 rule
- **M** Mallampati score
- **O** Obstruction?
- **N** Neck Mobility

Look

- Morbidly obese
- Facial hair
- Narrow face
- Overbite
- Trauma

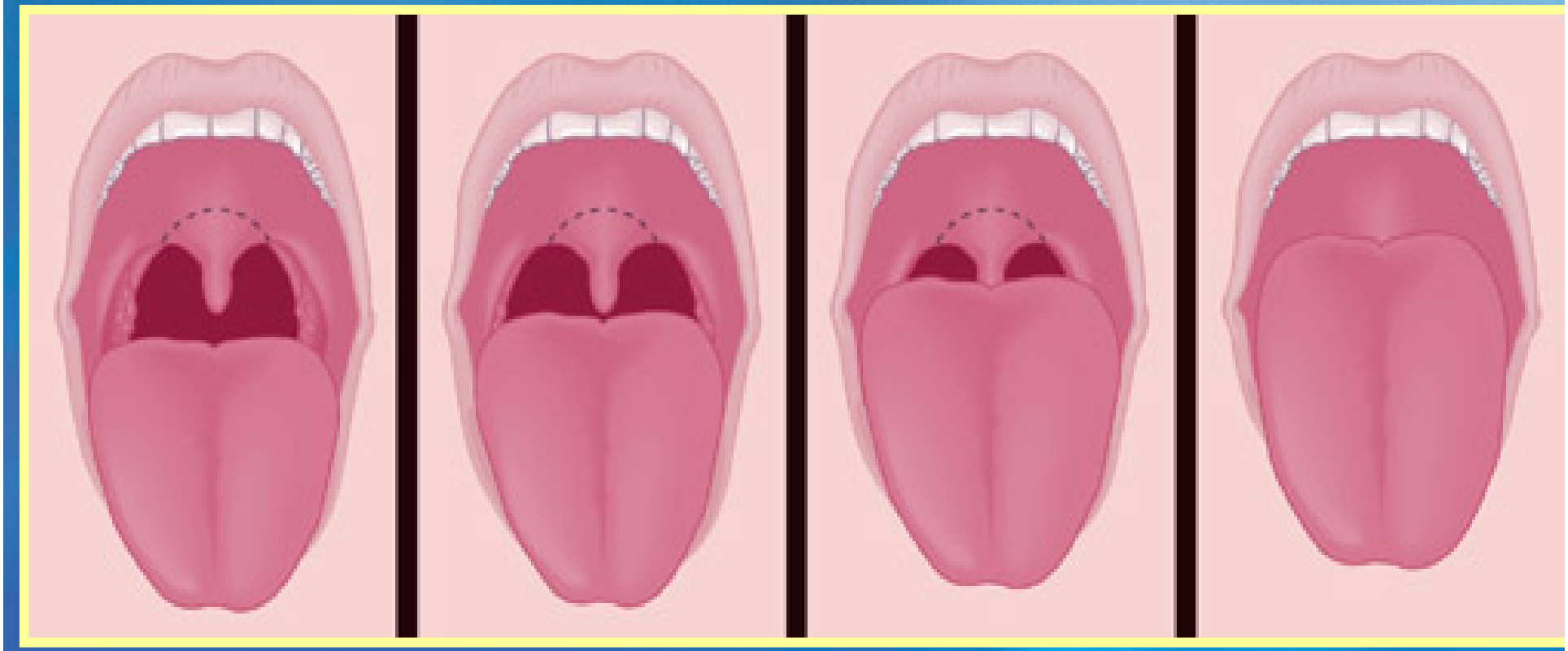
Evaluate 3-3-2

- Temporal Mandibular Joint
  - Should allow 3 fingers between incisors
- Mandible
  - 3 fingers between mentum & hyoid bone
- Larynx
  - Two fingers from floor of mouth to thyroid cartilage

Mallampati Score

- Evaluates ability to visualize glottic opening
  - Patient seated with neck extended
  - Open mouth as wide as possible
  - Protrude tongue as far as possible
  - Look at posterior pharynx
  - Grade based on visual field
    - Grades 1,2 have low intubation failure rates
    - Grades 3,4 have higher intubation failure rates

Mallampati Grades



Class I Class II Class III Class IV

⇑ *Difficulty* ➔

O: Obstruction?

- Blood
- Vomitus
- Teeth
- Epiglottis
- Dentures
- Tumors
- Impaled Objects

N: Neck Mobility

- Spinal Precautions
- Impaled Objects
- Lack of access

The Basics

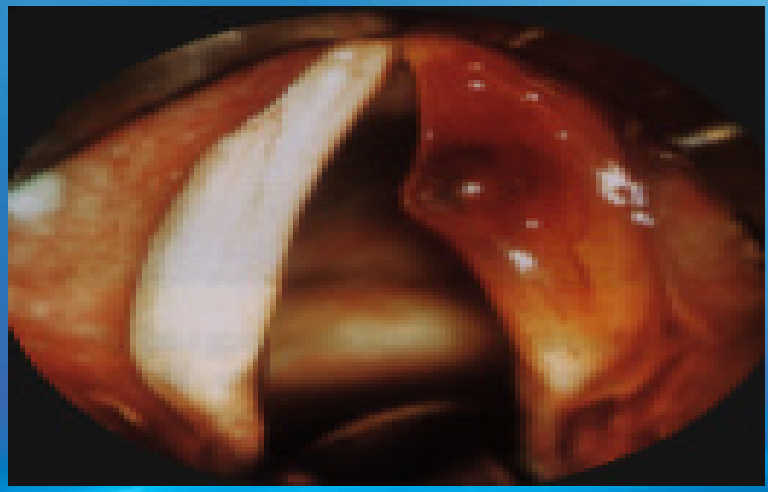
- Can the patient ventilate on his or her own?
  - SpO_2 > 92% on high-flow oxygen
- Beyond the scope of practice of team on scene?
  - Where is next level?
- Evaluate ability to use bag-mask device
- Have a backup means to maintain airway

Sellick Maneuver

- Dr. Brian Sellick (1918-1996)
  - Doctor of Anesthesia-Middlesex Hospital, London, England
  - “The Father of Cricoid Pressure Maneuver”

Fix the problem

- Seal all open wounds in chest and neck
- Will you cause more damage by intubation?
- Can you ventilate?
- Positioning (KED Board)

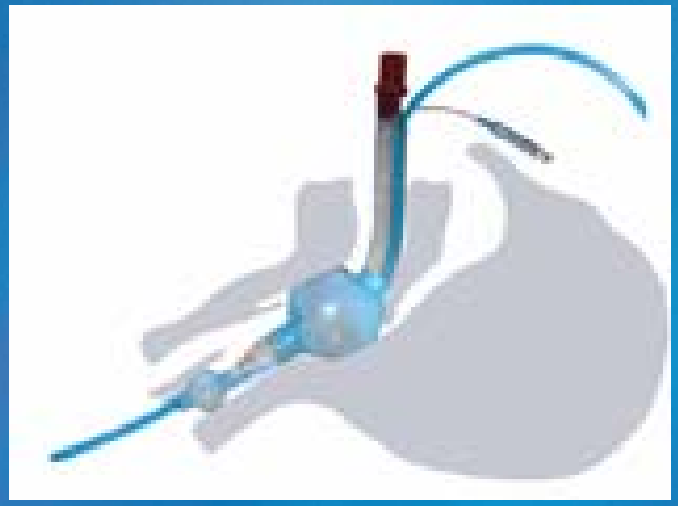


What can we do?

- Can’t see, Can’t Intubate?
  - SALT
  - KING
  - COMBI
  - Bougie
  - Digital
  - 2 Tubes ?
  - Surgical

S.A.L.T. Airway Device

King Airway Device



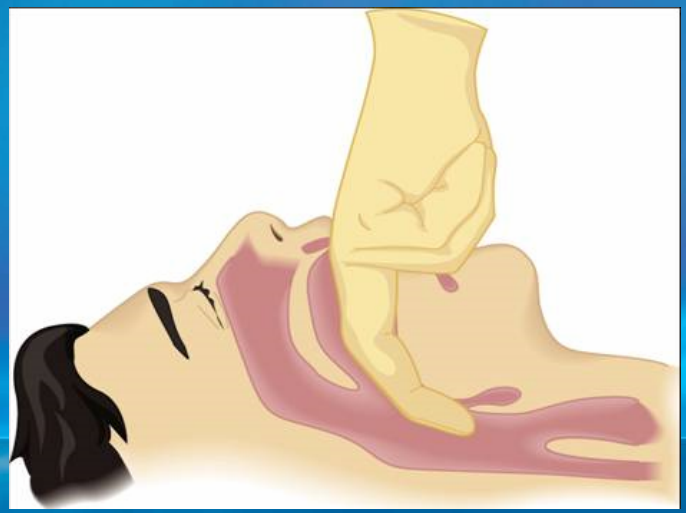
KING LT
Insertion

Bougie

- Blind insertion
- Feed tube over bougie once “clicking” is felt

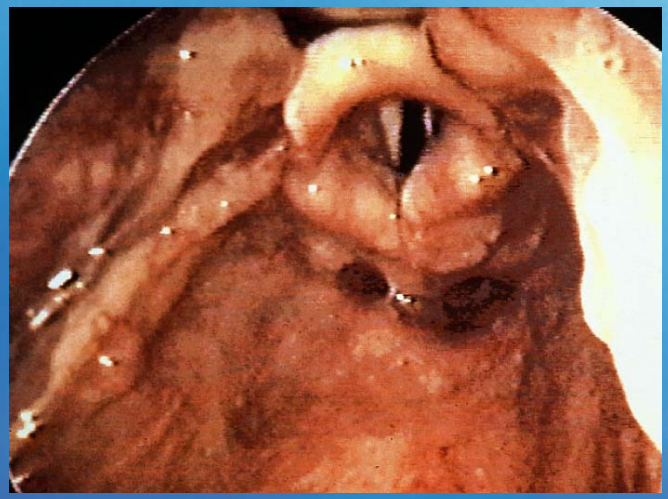
Digital Intubation

- Technique must be practiced
- Spinal compromise
- **Must place hand in patient's mouth**



Leave the missed tube !

- Goes against every text and national standard
- BUT IT WORKS !
- Tracheal trauma a potential



Cricothyrotomy

- Needle

- Commercial Devices
  - Melker Airway
  - Quick Trach

- Good old surgical !

BACK UP PLAN, REVISE, ADAPT, OVERCOME !

- Failure is not an option
- Plan B, C, D, E, F….
- Don’t allow ego to stand in the way of the patient’s best interest

Case Studies

1. Gunshot wound to the face
2. Fall of 65 feet
3. Car vs. Semi with ejection
4. Tracheal laceration by saw

Case Study 1

- 18 year old male self inflicted GSW to the face
- Pt. still conscious
- What airway compromise do you think of?
- What interventions are you prepared to do?

Case 1 Cont.

- Respiratory rate 10 bpm
- Pulse 120 regular
- BP 150/92

- Can you clear his c-spine in field?

- What options can you think of?

Case 1 Cont.

- Airway Options
  - Keep forward with C-Spine in KED board
  - Rule C-Spine injury out and allow to kneel on elbows for transport
  - RSI patient and secure airway

Case Study 2

- 34 year old female inspecting a grain plant and falls 65 feet down a narrow shaft striking landings on the way down.
- Upon arrival find her with agonal respirations and copious amounts of blood coming from her airway

Case 2 Cont.

- Respirations: Agonal
- Pulse: 40
- BP: not obtained

- As you suction the blood from the pharyngeal area, you are having a difficult time recognizing any anatomy

- Chest is developing subcutaneous emphysema

Case 2 Cont.

- Upon looking with a larnygoscope, you note large black area which appears to be a tracheal tear.
- What options do you have?

Case Study 3

- Car vs. Semi
- Car went under back tires of semi, crushing interior of vehicle and ejecting occupant onto road way.
- Unresponsive 23 year old male, takes final breath upon walking up to patient. Heavy blood flow from mouth and nose.

Case 3 Cont.

- Respirations 0
- Pulse 118

- C-Spine controlled
- Suction proves to be unremarkable on clearing airway
- Visualization of vocal cords unobtainable
- Crew on scene unable to perform a cricothyrotomy

- What options do you have?

Case 3 Cont.

- LMA, Combitube, King unable to secure airway do to heavy bleeding
- Suctioning can't keep up with blood flow
- Blind insertion of endotracheal tube
  - 1st tube – epigastric
  - 2nd tube – epigastric
  - 3rd tube – tracheal placement

Case Study 4

- Male with tracheal laceration from masonry saw.
- Gurgling respirations upon arrival.
- What are your initial thoughts?

Case 4 Cont.

- Occlude the open wound
- Direct intubation could cause tracheal trauma or separation
- Direct criocothyrotomy

Closing

- Never become complacent
- Always have more tools and tricks than the situation ever calls for.
- Never say Never! ! !

Questions?