Foundations of Emergency Airway Management:
Drop that Difficult Tube!

Updated:
October 10, 2011

Benjamin Lawner, DO, EMT-P
Department of Emergency Medicine
University of Maryland School of Medicine

OBJECTIVES

At the conclusion of this presentation, participants should be able to:

1. Anticipate the difficult airway
2. Manage the difficult airway
3. Mitigate (and rescue!) the difficult airway

The lecture's goal is to increase your chances at first pass laryngoscopic success!

PROBLEMS WITH AIRWAY MANAGEMENT

-Declining opportunities, declining indications, and declining success rates for endotracheal intubation
-Intubation not linked reliably to improved outcomes in trauma and cardiac arrest
-Prehospital intubation for head injured patients also controversial
-The key to success is therefore an organized, structured, and consistent approach to advanced airway management
-Declining opportunities in practice make it difficult to hone techniques associated with expert laryngoscopy

THE "Ps" OF INTUBATION: PREPARATION

-In addition to the usual supplies, ensure that your rescue and back up plans are at the ready
-2 tubes, 2 blades, endotracheal tube introducer, C02 detector, supplies, drugs
-Positioning of the patient is vital to success
-Proper positioning ensures alignment of the airway axes
-Airway axes include: laryngeal, hypopharyngeal, oral
-The axis alignment strategy is designed to draw your eye to the glottic opening
-Remember ear to sternal notch; this strategy also holds true for obese patients
-The patient's external auditory meatus should rest in the same horizontal plane as the sternal notch
-Drug dosages and appropriate selection
-RSI used to increase first pass success

Ear to sternal notch photograph from Rich Levitan's AirwayCam.com site

PREOXYGENATION

-Place patient on a high flow oxygen mask

-High flow o2 will help fully saturate hemoglobin

-Patients requiring emergent intubation have poor reserve; ensure adequate pre-oxygenation times

PREDICTION OF DIFFICULT AIRWAY

-The only difficult airway is the one at the end of your laryngoscope blade; it is impossible to predict all failed intubations

-Prepare in exactly the same fashion for every airway encounter

-Several reliable predictors for difficult intubation exist

-The "Mallampati" score may not be reliable for emergency and prehospital settings

-Though a Mallampati score of 3-4 may predict difficult visualization, emergency patients are often unable to sit up and obey commands

-Do not rely solely on Mallampati!

-Factors that obscure visualization include:

- -Decreased inter-incisor distance (limited mouth opening)
- -Large tongue
- -Maxillofacial trauma
- -Limited neck mobility
- -Violation of the "3-3-2" rule

-The 3-3-2 rule describes anatomic factors associated with a comparatively "easy" intubation

- -THREE fingers inside the mouth
- -THREE fingers from the hyoid bone to the chin (along the floor of the mouth)
- -TWO FINGRS from the thyroid cartilage to the floor of the mouth

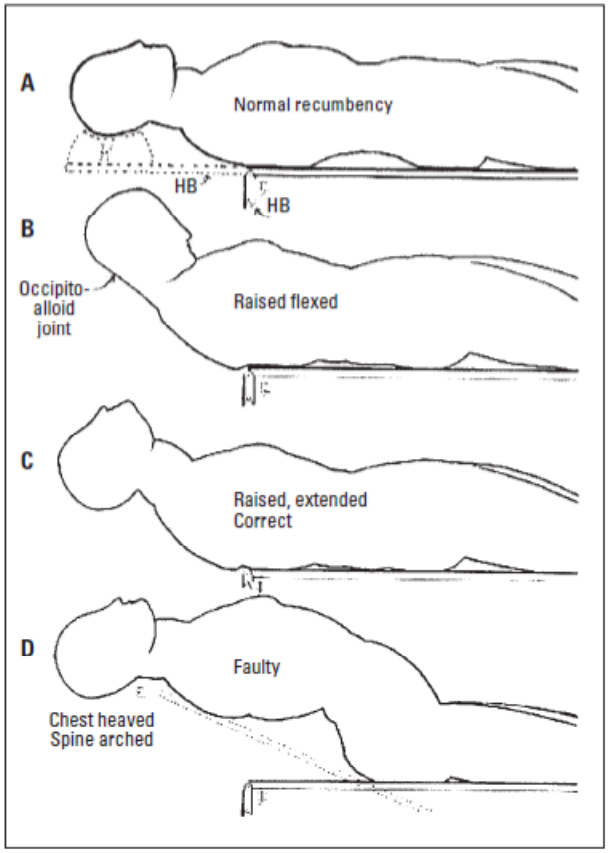
PASSING THE TUBE

-Ensure a low grip on the laryngoscope handle

-Ensure that the tongue is not straddling the blade

-The tongue should be to the left of the blade
-Progressively visualize structures; avoid shoving the blade directly into the mouth
-Utilize EXTERNAL LARYNGEAL MANIPULATIOIN
-Use the right hand to position the larynx for the best laryngoscopic view
-Rescue maneuvers may help for difficult airways
-HELP! (Head elevated laryngoscopic maneuver)
-Small cadaveric study showed that glottic opening was improved when head was elevated relative to the rest of the body
-Engage the tip of the blade into the vallecula

A “HELP” position (C) that may facilitate intubation during a difficult airway encounter:
Levitan, et al. Annals of Emergency Medicine. 41(3):2003.



WHAT ABOUT CRICOID?
-Little evidence to support continued use
-May prevent passive insufflation
-Not designed to improve view
-Not a tool for visualization
-AHA Guidelines do not endorse “routine” use
-Focus on other ways to achieve bag valve mask ventilation and avoid gastric insufflation

TUBE POSITION

-Arcuate tube shape occludes view
-Fashion stylet in “straight to cuff”
-The ET Tube will rest along the posterior hypopharynx
-Tip of tube angled anteriorly and point toward glottic opening

RESCUE PLANS

-Don’t forget about the BVM
-Rescue devices designed to facilitate ventilation
-The ideal rescue device should be blindly placed and require little training for its use
-LMA well researched in prehospital and hospital settings
-Lots of other options; be sure you are familiar with what is stocked in your difficult airway cart

BOUGIE/ENDOTRACHEAL TUBE INTRODUCER

-Don’t forget the endotracheal tube introducer/bougie
-The bougie is a plastic tube that has a 30 degree bend at the end
-Best utilized when views of larynx are partially or totally obscured
-The angled distal tip should theoretically follow the contour of the trachea and insert itself into the glottic opening
-Keep your blade inside the patient’s mouth while attempting to insert the bougie
-Though placement is “blind, “ you may feel tracheal rings as the hollow plastic tip bumps against the trachea
-Introducers that slide too far inferiorly may be placed in the esophagus
-The endotracheal tube is inserted over the introducer
-You may have to gently rotate the endotracheal tube to guide it off of the introducer
-Insert the endotracheal tube at the desired depth

CRICOTHYROIDOTOMY

-The ultimate rescue plan for cant intubate/can’t ventilate
-Rapid access to failed airway
-Identification of landmarks critical
-Few supplies required for procedure
-Should be mandatory procedure training for medics/providers credentialed in rapid sequence intubation

CONFIRMATION OF TUBE

-End tidal Co2 gold standard
-Diagnostic as well as confirmatory
-Multi-modal approach needed in cardiac arrest
-Low flow states (hypoperfusion, prolonged down time) may yield false negative readings