

Difficult Airway Management

Arthur Jones, EdD, RRT

Learning Objectives

- ▲ Identify conditions predisposing to difficult airway access.
- ▲ List the contents of a difficult airway cart.
- ▲ Describe and compare special devices for airway access and management

Difficult Airway Access

Difficult Intubation

- ▲ Defined (ASA)- clinical situation in which a trained anesthesiologist experiences difficulty with mask ventilation, difficulty with intubation, or both.
- ▲ Insertion of tube under standard laryngoscopy requires:
 - ◆ more than three attempts
 - ◆ more than ten minutes

Difficult mask ventilation

- f* Inability to maintain SpO₂ > 90% with 100% O₂ and PPV with mask
- f* Inability to prevent or reverse signs of hypoventilation with mask PPV
 - ◆ chest excursion
 - ◆ auscultatory signs
 - ◆ hemodynamic signs

Difficult mask ventilation

- ◆ Causes
 - f* trauma- face, airways
 - f* burns
 - f* beards
 - f* edentulous patients

Difficult intubation- causes

***f* Anatomic**

- ◆ Micrognathia
- ◆ Macroglossia
- ◆ Short or fixed neck
- f* Trauma- neck or face
- f* Burns- airway edema

Difficult intubation- causes

◆ Infections

- f* Retropharyngeal Abscess
- f* Epiglottitis
- f* Laryngotracheobronchitis
- f* Submandibular Abscess

Difficult intubation- causes

- ◆ Neoplasms
- ◆ Non-neoplastic, non- infectious conditions
 - f* Rheumatoid Arthritis
 - f* Diabetes Mellitus
 - f* Pregnancy
 - f* Obesity
 - f* Anaphylaxis

Link to predicting difficult intubations
http://www.nda.ox.ac.uk/wfsa/html/u09/u09_025.htm

**Difficult Airway
Devices & Techniques**

Difficult airway cart

◆ Equipment

- f* Fiberoptic bronchoscope
- f* Fiberoptic laryngoscope
- f* Laryngeal mask airway
- f* Combitube
- f* Lighted stylet
- f* Endotracheal tube introducer

Difficult airway cart

◆ Equipment

- f* Retrograde intubation kit
- f* Cricothyrotomy kit
- f* Percutaneous tracheotomy, ventilation
- f* Extra bulbs, batteries

Link to UCSD difficult airway cart
<http://anes-som.ucsd.edu/airway2.htm>

Difficult airway cart

◆ **Medications**

- f* Oxygen
- f* Neuromuscular blockers
 - ◆ succinylcholine
 - ◆ rocuronium
 - ◆ rapacuronium
- f* atropine
- f* midazolam, fentanyl, etomidate

**Direct Visualization
Intubation Devices**

Fiberoptic laryngoscope

▲ **Bullard**

Fiberoptic laryngoscope

▲ **Bullard**

- ◆ Direct visualization of vocal cords
- ◆ non-alignment of oral-laryngeal axes
- ◆ Minimal head manipulation
- ◆ Accommodates small mouth

Fiberoptic laryngoscope

▲ **McGrath^(TM) video laryngoscope**

Link to intubation with McGrath^(TM)
http://www.youtube.com/watch?v=_WbJJ9XB67I&feature=related
Link to Vitaid products
<http://www.vitaid.com/canada/index.htm>

Fiberoptic laryngoscope

- ▲ **Airtraq^(TM) single-use laryngoscope**
- ▲ **Res-Q-Scope II^(TM)**
- ▲ **Verathon Glidescope^(TM)**

Link to Airtraq
<http://www.airtraq.com/airtraq/portal.portal.action>
Link to Res-Q-Scope
<http://www.res-q-tech-sa.com/>
Link to Verathon Glidescope
http://www.verathon.com/glidescope_index.htm

Blind Intubation Devices

Mallinckrodt Cuffed Oropharyngeal Airway (COPA)™

- ◆ Indication- difficult mask ventilation, intubation
- ◆ Advantage- ease of insertion
- ◆ Disadvantage- no protection from aspiration
- ◆ Caution- teeth may tear cuff

Proseal™ Mask Airway (LMA)

Link to LMA placement video
<http://vam.anest.ufl.edu/airwaydevice/aintree/laryngealmask.html#sim>
Link to Vitaid products
<http://www.vitaid.com/canada/index.htm>

LMA

- ▲ Indications
 - ◆ Empty stomach (pre-operative)
 - ◆ Difficult mask fit
 - ◆ Difficult intubation
 - ◆ Need for free hands
 - ◆ Singers/public speakers; e.g., Julie Andrews

LMA

- ▲ Advantage- ease of blind insertion
- ▲ Disadvantage- no protection from aspiration

Combitube™

- ◆ Advantages
 - f* ease of blind insertion
 - f* protection from aspiration
 - f* evacuation of stomach
- ◆ Contraindication- esophageal dx

Bougie Endotracheal Introducer

- ▲ Blind intubation
- ▲ ETT exchange

Lighted stylets

- ▲ Transilluminate trachea
 - ◆ Blind intubation
 - ◆ Placement confirmation
- ▲ Brands:
 - ◆ Trachlite ®(Rusch)
 - ◆ Trachlight ® (Laerdal)
 - ◆ Surch-lite ® (Aaron Medical)

Link to video on using lighted stylet
<http://vam.anest.ufl.edu/airwaydevice/videolibrary/LightedStylet01.html>

Lighted stylets

**Laerdal
Trachlight™**

Link to Laerdal (TM)
<http://www.laerdal.com/document.asp?subnodeid=12553195>

Lighted stylets

**Aaron Surch-
lite™**

Link to Aaron Medical
<http://www.aaronmed.com/enproductslightflex.html>

Surgical Interventions

Retrograde Intubation

Wire through
cricoid
membrane

Intubation kit available from Cook Critical Care
<http://www.cookmedical.com/home.do>

**Tube Placement
Confirmation**

Exhaled CO2 detectors

Vital Signs ^(TM) C-CO2 indicator

Link to vital signs
<http://www2.vital-signs.com/VSIHome/html/english/default.aspx>

**Beck airway airflow monitor
(BAAM) TM**

Airflow creates a whistle

Cook Airway Exchange Catheter ^(TM)

- ◆ Exchanger advanced in ETT
- ◆ Old ETT removed over exchanger
- ◆ New ETT advanced over exchanger
- ◆ Adapter to ventilate through catheter

Available from Cook Critical Care
<http://www.cookmedical.com/home.do>

END

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