Pediatric Airway Emergencies: Evaluation and Management

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Grand Rounds Presentation
January 2002
Anatomic and Physiologic Considerations of the Pediatric Airway:
Initial Assessment:

- Signs of impending respiratory failure:
  - Reduced level of consciousness or lethargy
  - Quiet, shallow breathing
  - Apnea

- The above require immediate progression to endoscopy and/or intubation.
History:

- Description of Onset
- Age at onset
- History of foreign body aspiration/ingestion
- Aggravating factors: feeding/sleeping
- History of intubation
- Birth history (syndromes, birth trauma)
Physical Exam:

- Inspection
- Ascultation
- Repositioning
Flexible Laryngoscopy:

- Proper Equipment
- Assess nares/choanae
- Assess adenoid and lingual tonsil
- Assess TVC mobility
- Assess laryngeal structures
Radiology:

- Plain films:
  - Chest and airway AP and lateral
  - Expiratory films
  - High vs. low kilovoltage
- Fluoroscopy
- Barium Swallow
- CT, MRI, Angiography
Flexible Bronchoscopy:

- Does not require general anesthesia
- Mainly diagnostic purposes
- Limited intervention (e.g. suctioning)
- Can be used for intubation
- Limited airway control
Direct Laryngoscopy and Rigid Bronchoscopy

- **Indications:**
  - Severe or progressive airway obstruction
  - No diagnosis after flexible laryngoscopy and radiology
  - Subglottic pathology suspected

- **Advantages over flexible bronchoscopy:**
  - Better control of the airway
Direct Laryngoscopy
Direct Laryngoscopy

- Insufflation technique:
The Ventilating Bronchoscope

A. Light source and telescope
B. Prismatic light detector and attachment to light source
C. Aspiration and instrumentation channel
D. Connector to anesthesia
E. Telescope bridge
Rigid Bronchoscopy
Rigid Bronchoscopy:

- Complications:
  - Loss of airway control
  - Injury to subglottic space
  - Damage to teeth or gums
  - Airway bleeding
  - Pneumothorax
  - Failure to recognize pathology
Specific Etiologies of Airway Emergency
Laryngotracheobronchitis
Bacterial Tracheitis
(Membranous Tracheitis)
Epiglottitis
Choanal Atresia
Pyriform stenosis
Laryngomalacia
Vocal Cord Paralysis
Subglottic Stenosis
Subglottic Hemangioma
Tracheoesophageal Fistula
Laryngeal Cleft

FIGURE 4  Laryngeal and tracheal clefts.  
A: Classification of laryngeal clefts.  B: Surgical repair by freshening margin of cleft and by removing more mucosa from esophageal surface than laryngeal surface.
Vascular Anomaly
Recurrent Respiratory Papillomatosis
Airway Foreign Bodies
Case Study: History

- Consult from the Neonatal ICU:
  - Newborn infant in increasing respiratory distress since birth.
  - Oxygen saturation is now 100%, but the child has begun to use accessory muscles.
  - Feeding aggravates the distress.
  - Infant has a weak cry, and pediatritians notice noisy breathing.
  - No abnormal birth history.
Case Study: Physical Examination

- Newborn female infant supine in the bed, sat’ing 100% on room air
- Moderate use of accessory muscles
- Moderate biphasic stridor
- Audible breaths through both nares
- Repositioning has little effect on stridor
Case Study: Endoscopy