Silent Aspiration
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Silent
- Lack of audible sound or presence of sounds of very low intensity.
- Any absence of communication, including in media other than speech.
- In reference to nonverbal communication and spiritual connection.
- Silence also refers to no sounds uttered by anybody in a room or area. (Wikipedia)
- If I can’t hear it, is it significant?

Penetration vs. Aspiration
- Penetration
  - Laryngeal penetration
    - Above the vocal folds
    - To the level of the vocal folds
  - Post-swallow residue
- Aspiration
  - Passage of material below the level of the true vocal folds in the subglottic airway or trachea
  - Silent: absence of symptoms
Silent aspiration

- Difficult to diagnose something that is silent ...or is it?
  - Cough may be absent but are there other clinical markers?
  - Clinical signs have poor reliability and specific s/s utilized as indicators have not been examined systematically for correlation
- Objective measure is the MBS
  - Lacks "natural" feeding environment

Swallow Study

MBS: normal and abnormal
Valleculae
Base of the tongue and top of the epiglottis

Pyriform sinuses

Aspiration: 3 types

- **Aspiration before** the actual swallow
  - Either the result of insufficient closure of the oral cavity during the preparatory phase or inability to start the swallow reflex when contrast enters the pharynx

- **Aspiration during** the actual swallow
  - Due to insufficient closure of the larynx

- **Aspiration after** the actual swallow
  - The result of stasis of contrast in the pharynx when the larynx opens the contrast leaks into the trachea
Case Study #1 - JM

- 35 weeks, Twin A
- Slow feeder – No g,c,c,v.
- Loud feeder with raspy voice
- Began to gag and spit with texture grading
- MBS – aspiration of dissolvable Puff
- Parent’s told to feed by EI

Baseline Feeding JM

Case Study #2 - TC

- 32 weeks by Ballard, 34 by dates
- Developed BPD, home on O2
- Fed orally in the NICU, reflux from the beginning
- Occasional gagging, choking and back arching
- GT placed at 2 months
Baseline Feeding TC

Significance
• With increasing survival rates of preterm infants feeding issues contribute to:
  ▪ Prolong hospitalization
  ▪ Co-morbidities
  ▪ Increased health care costs
  ▪ Delay in other oromotor behaviors
  ▪ Emotional costs to families
  ▪ 31% experience difficulties with feeding prior to 1 year of age
  ▪ 40% referred to an outpt clinic for feeding and growth concerns have a h/o of preterm birth

Preterm infant
• Bolus transport and clearance inefficient
• Increased resistance to bolus flow across the UES during each swallow
• Increased potential for fatigue during multiple consecutive swallows, interrupting normal s/s/b pattern
• Generally improves by 36-38 weeks but not always
• For infants suspected of dysphagia, swallowing function deteriorates as the feed progresses. Abnormalities not noted in the first few swallows.
Preterm infant

- Feeding difficulties:
  - Perinatal complications
  - Consequences of prematurity
    - Anatomic issues
    - Gastrointestinal
    - Respiratory
    - Neurologic
    - Environmental and learned behavioral
  - “normal” feeders in the NICU can exhibit feeding problems 6-12 months later
  - Early identification of problematic feeding patterns are important to avoid further problems

Dysphagia

- Defined as difficulty in swallowing and includes problems with:
  - Moving food/liquid from the mouth to the stomach
  - Protecting the airway while a bolus is in the pharynx
- Incidence twice as likely in a former preterm infant vs. term infant
- Multiple etiologies involved

Oropharyngeal Dysphagia

- Dysphagia limited to problems of the oral or pharyngeal cavities and characterized by:
  - Disorganized or abnormal sucking patterns, failure to thrive, drooling, apnea/desats, wheezing, stridor, bradycardia, audible congestion, audible swallows, loss of bolus, excessive air intake or gas, poor tongue control for latching
  - Difficulty transitioning to solids, increased gagging, orofacial hypersensitivity, coughing, food refusal
Aerodigestive tract

• The common pathway that facilitates safe breathing and safe swallowing.
• Includes:
  • Nasopharynx, oropharynx, hypopharynx, esophagus, stomach
  • Supraglottic, glottic, subglottic airways
• Strong association between laryngeal penetration and/or aspiration and pneumonia

Management

• Suspected oropharyngeal dysphagia
  • “Bedside” evaluation
    • Observation prior to oral feeding
    • Assessment of oral structures
    • Nutritive suck assessment
    • Spoon feeding (when appropriate)
  • Post feeding observation
  • Instrument assessment
    • Modified barium swallow
    • Other studies
Modified Barium Swallow

- Modified Barium Swallow (MBS)
  - Coordination of oral & pharyngeal phases of the swallow
  - Trigger time of the swallowing reflex
  - Vallecular residue after the swallow
  - Amount of pooling in pyriform sinuses
  - Penetration into the laryngeal vestibule
  - Aspiration

Management/Treatment

- Correct the underlying cause if possible
- Goal of interventions
  - Facilitate oral motor skill development
  - Decrease the swallowing dysfunction
  - Promote growth
Management/Treatment

- Strategies
  - Acid suppression
  - Cue based approach to oral feeding
  - Positional adaptation
  - Texture variations
  - Bottle or nipple changes
  - Modify feeding technique
  - Alternative feeding methods
  - Requires ongoing assessment by a feeding specialist

Back to JM and TC

Selected References