Post-extubation Dysphagia

AnnMarie Knight, PhD, CCC-SLP
Ashlie Hess, MS, CF-SLP
Leah Galuzzi, MS, CCC-SLP
Disclosures

AnnMarie Knight, PhD, CCC-SLP

- Assistant Professor, Columbia College SLP Program, Columbia, SC
- SLP at Providence Hospital in Columbia, SC

Ashlie Hess, MS, CF-SLP

- CFY at Providence Hospital in Columbia, SC

Leah Galuzzi, MS, CCC-SLP

- SLP at Palmetto Health Richland, Columbia, SC

*The speakers did not receive any financial compensation for this presentation from the entities/institutions listed above*
Objectives

After this presentation, participants will be able to:

1. Understand the impact of intubation on the physiology of the larynx and swallowing mechanism.
2. Be able to identify patients who are at risk for post-extubation dysphagia.
3. Understand current literature regarding nursing screening dysphagia in patients who are extubated.
The Impact


- **United States:**
  - 5 million ICU admissions yearly
  - 1 million result in intubation

- Up to 56% of intubated patients have post-extubation dysphagia

- 50% of extubated patients with dysphagia aspiration (? under-reported)

- Concerns: malnutrition, dehydration, increased HCAP, increased LOS, re-intubation, mortality (See, et al., 2016)
Intubation Defined

- **Endotracheal intubation**
  - Placement of a flexible tube into the trachea to maintain an open airway
  - Interferes with the mechanics of swallowing and airway protection (Burkhead & Postma, 2010)
Indications for Intubation

- Inadequate oxygenation (amount of oxygen in blood)
- Inadequate ventilation (cyclical air and gas exchange)
- Pulmonary toileting due to poor spontaneous airway clearance
- Airway protection to inhibit large volume aspiration
- Multiple trauma with head injury and abnormal mental status
- Respiratory arrest or failure
- Airway obstruction
- Inhalation injury with glottal erythema or edema
- Administration of anesthetic during general surgery

from Burkhead & Postma, 2010, pg 193
Considerations

● Who is intubating the patient?
  ○ Paramedic at the scene
  ○ ER physician
  ○ Anesthesiologist prior to surgery
  ○ Surgeon, pulmonologist, other physician

● Circumstances of the intubation
  ○ Non-emergent intubation- before a planned surgery or procedure
  ○ Emergent intubation- respiratory arrest or airway obstruction
    ■ in hospital, at scene, or en route
  ○ Self-extubation w/ re-intubation
  ○ Multiple intubations
Considerations

- **Airway visualization**
  - Intubation with or without aid of laryngoscope
  - Mallampati Classes I-IV (oral cavity), class III-IV difficult to intubate
  - Cormack-Lahane Grades I-IV (pharyngeal cavity, class III-IV difficult to intubate
Let’s think about what we know...

● Motor (efferent) innervation
  ○ CN V- muscles of mastication
  ○ CN VII- facial musculature
  ○ CN IX- stylopharyngeus muscle
  ○ CN X- soft palate, larynx, pharyx, esophagus
  ○ CN XII- intrinsic and extrinsic tongue muscles

● Sensory (afferent) innervation
  ○ CN V- oral & nasal cavities
  ○ CN IX- posterior tongue, pharynx
  ○ CN X- pharynx, larynx, esophagus

● Tissues contain highly specialized and highly sensitive receptors
  ○ Chemoreceptors (chemical), Mechanoreceptors (tactile), Nociceptors (noxious) & Thermoreceptors (thermal)
Think critically about anatomy & physiology

- Normal swallow requires
  - Intact strength and coordination (motor)
  - Intact laryngeal and pharyngeal sensation (sensory)
  - Oral, facial, labial, palatal, pharyngeal, laryngeal structures (musculature and mucosa) involved
  - The way we keep function is to use it: “use it or lose it”
    - What happens if you are in bed for a week and don’t stand or walk?

- When a patient is intubated…
  - A system designed to be closed is now open
  - There is a foreign body impeding normal function
  - System is not being “used” the way it was designed
From Burkhead & Postma (2010)

● Post-extubation swallow pathophysiology
  ○ Strength
  ○ Sensation
  ○ Coordination

● Possible injuries
  ○ Vocal fold damage
  ○ Muscle atrophy (disuse)
  ○ Cricoarytenoid joint dysfunction
  ○ Stenosis
  ○ Edema
  ○ Hematoma
  ○ Ulceration
  ○ Granuloma

● Effects of residual pharmacologic agents
  ○ Arousal level
  ○ Mental status
So your patient is extubated...now what?

- Current protocols at Providence Health and Palmetto Health in Columbia, SC
  - Patients intubated >48 hrs & patients who self-extubate= automatic SLP swallow evaluation consult
  - Patient must be extubated 24hrs before swallow evaluation is completed
  - Intubated <48 hrs
    - Nursing screen (Providence)
    - Doctor discretion (Palmetto)

- Should nurses screen extubated patients before referral is made to SLP?
  - Current literature (Hint: there isn’t much...)
Screening

- **ASHA convention presentation 2012**
  - Screening was developed using current evidence and implemented with extubated patients
  - Screening tool has not been published

- **ASHA convention presentation 2017**
  - Discussed the research behind previously presented screening tool
  - Screening tool 3rd revision, submitted for publication so not yet available

- **Research gate, Dr. Catriona Steele**
  - Alert when article is accepted for publication
Nursing Screening, cont’d

- Example of a nursing screen
- Modified GuSS for ICU patients who had been intubated
- Article did not include any data regarding whether the screening was an adequate measure

Christensen & Trapel (2017), pg 4
Nursing Screening, cont’d

- See, et al. (2016)
  - Compared post-extubated patients outcomes with and without Nursing Performed Screening (NPS)
  - Adapted Massey Bedside Swallow Screening (Massey & Jedlika, 2002) for use with ICU patients
    - Screening form not included in the article (listed as an appendix)
  - According to results, use of NPS associated with:
    - 111% increase in odds of oral feeding at ICU discharge
    - 59% decrease in post-extubation pna
    - In pts intubated >72hrs
      - 127% increase in odds of oral feeding at ICU discharge
      - 80% decrease in post-extubation pna
      - 25% decrease in hospital LOS
Current Evidence
Current Evidence
Current Evidence
Case Study #1

- 62 y/o female admitted s/p pedestrian vs truck
- Injuries: T5-6 fx with L hemiparesis (likely related to spinal trauma per neuro), interspinous ligament sprain in cervical/thoracic spine, paraspinal hematoma, L5 fx, lower sternal body fx, R pleural effusion/pneumothorax, multiple bilateral rib fxs
- PMH: HTN, DM, Schizophrenia

- Intubated for low GCS/airway protection with 7.5 Hi Lo Evac ETT
- Intubated 4 days
Case Study #1

On bedside swallow evaluation:

• s/sx severe dysphonia characterized by weak/hoarse vocal quality and weak cough; unable to participate in s/z ratio

• endorsed the following symptoms: run out of air when talking, strain to speak, lump in throat, choking on saliva, pain or scratchiness in throat

• recommend: NPO
Case Study #1

FEES completed 5 days s/p extubation (hospital day 9):
  • Moderate oropharyngeal dysphagia
  • Silent aspiration of thin liquids, penetration to the vocal folds with nectar thick liquids, trace penetration of honey thick liquids
  • No penetration/aspiration with solids
  • Rec: mechanical soft diet with honey thick liquids
Case Study #1

Dysphagia:

• Lingual weakness
  • prolonged bolus transit and reduced oral containment
• Reduced supraglottic closure
  • penetration/aspiration during the swallow
• Reduced tongue base retraction
  • mild vallecular residue
Case Study #1

Laryngeal exam:
• Reduced vocal fold adduction with large posterior glottic gap
• Bilateral posterior vocal fold lesions
• Lesion also extending across posterior commissure
• L vocal fold edema
• Additional white lesion on medial aspect of L vocal fold which moves with respiration
Case Study #1

Video swallow study completed 18 days later and s/p 5 tx sessions (hospital day 27):

- Moderate oropharyngeal dysphagia
- Silent aspiration of thin and nectar thick liquids (aspiration with nectar resolved with cup sip)
- No penetration/aspiration of solids
- Rec: mechanical soft diet/nectar via cup
Case Study #1

Dysphagia:
- Lingual weakness
  - reduced bolus manipulation/formation, slowed transfer, and reduced oral containment with posterior spillage
- Reduced airway protection (hyolaryngeal movement)
  - aspiration during the swallow
Case Study #2

- 72 y/o male admitted s/p thoracoabdominal aneurysm rupture
- Admitted for repair/artery bypass
- PMH: CHF, Hep C, HTN, COPD

- Intubated for surgical procedure with 8.5 Hi Lo Evac ETT
- Intubated for 7 days d/t post-op complications (GI bleed)
Case Study #2

On bedside swallow evaluation:

• s/sx moderate dysphonia characterized by breathy/hoarse vocal quality and weak cough; s/z ratio WFL

• recommend: NPO
Case Study #2

FEES completed 3 days s/p extubation (hospital day 10):
  • Mild oropharyngeal dysphagia
  • Silent aspiration of thin liquids
  • No penetration/aspiration of nectar thick liquids/solids
  • Rec: Full nectar thick liquid diet d/t prolonged NPO status and fatigue with solids
Case Study #2

Dysphagia:
- Lingual weakness
  - slowed bolus preparation and reduced oral containment with posterior spillage
- Reduced supraglottic closure
  - aspiration during the swallow
Case Study #2

Laryngeal exam (1st study):
  • L vocal fold hypomobility (remained in paramedian position)
  • Incomplete vocal fold adduction/abduction
  • Mild clear pooled secretions in pharynx at baseline
Case Study #2

Repeat FEES 7 days later and following L vocal fold injection with ENT as well as 4 tx sessions (hospital day 17):

• Mild oropharyngeal dysphagia
• No penetration/aspiration across consistencies
• Rec: Mechanical soft diet/thin liquids d/t edentulous status
Case Study #2

Dysphagia:

- Lingual weakness
  - slowed bolus preparation and reduced oral containment with posterior spillage
- Reduced tongue base retraction
  - mild vallecular residue with solids
Case Study #2

Laryngeal exam (2nd study):
- L vocal fold hypomobility (remained in medial position)
- Reduced vocal fold abduction
- Edema of L arytenoid/ventricular fold
- Mild amount of thick white secretions in laryngeal vestibule at baseline
Case Study #3

• 19 y/o M admitted s/p ~70 foot fall

• Injuries: pseudoaneurysm of ascending aorta, L adrenal injury, R kidney injury, small bilateral pneumothorax, pulmonary contusions, L liver injury, R acetabular fx, and C1 subluxation

• Hospital course complicated by PEA arrest, cardiogenic shock, and respiratory failure

• No PMH

• Pt intubated for respiratory distress with 7.5 Hi Lo Evac ETT

• Intubated 2 days
Case Study #3

On bedside swallow evaluation:

• sx/sx moderate dysphonia characterized by weak/hoarse vocal quality and weak cough; impaired s/z ratio

• recommend: regular diet/nectar thick liquids
Case Study #3

Video swallow completed 5 days following admission and 3 days s/p extubation (could not tolerate FEES):

• Moderate oropharyngeal dysphagia
• Silent aspiration of all liquids
• Rec: NPO
Case Study #3

Dysphagia:
  • Lingual weakness
    • reduced oral containment with posterior spillage
  • Reduced airway protection (hyolaryngeal movement)
    • Penetration during the swallow
  • Pt unable to eject penetration (weak cough) with eventual aspiration of all consistencies after the swallow
Case Study #3

- Hospital course complicated by continued dysphonia and increased respiratory distress

- ENT consult: “Bilateral vocal cord paralysis with posterior inflammation. I suspect that the paresis is due to his previous intubation. It is possible that the cuff put pressure on the recurrent laryngeal nerves. Unfortunately, he seems to be a moderate amount of inflammation posterior in the larynx, and this is concerning for possible scar formation. At this point, I recommend 8 mg of Decadron IV every 8 hours and that he be put on the PPI for reflux. His airway is quite narrow, and if he has any worsening, he may need to be intubated or possibly have a tracheostomy. It is not clear how well he would tolerate endotracheal intubation.”
References


References
