Dysphagia Therapy After Stroke

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Objectives:
• Identify the clinical relevance to post stroke dysphagia
• Discuss the various tools needed for dysphagia assessment
• Define the treatment options for dysphagia therapy
• Discuss case studies
DYSPHAGIA THERAPY AFTER STROKE

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Outcome Goals:

I. Describe the **clinical relevance** related to post stroke dysphagia.

II. Discuss dysphagia by **site of lesion**.

III. Discuss the various tools needed for dysphagia **assessment**.

IV. Discuss the **treatment options** for dysphagia therapy.
I. Clinical Relevance of Stroke

Oropharyngeal dysphagia

- Oral phase
- Pharyngeal phase
- Esophageal phase
Clinical Relevance of Stroke

• Fifteen million strokes occur worldwide each year
• 5 million associated deaths
• 5 million people left permanently disabled.
• In the United States,
  – 780,000 people suffer a new or recurrent stroke each year. [1]
Clinical Relevance of Stroke

• Up to one third of stroke patients suffer from pneumonia
  – Highest attributable mortality of all medical complications following stroke.
  – community-acquired pneumonia,
  – hospital-acquired pneumonia,
  – health care–associated pneumonia,
  – ventilator-associated pneumonia,
  – aspiration pneumonia,
  – pneumonia caused by organisms,
  – Most available data suggests post-stroke pneumonia is often due to aspiration.
Clinical Relevance of Stroke

What is Aspiration?

• Penetration
• Aspiration
Clinical Relevance to Stroke

- 43 to 54% - Experience aspiration
- 37% - Pneumonia
- 3.8% - Die of pneumonia
- 48% - Malnutrition [2]
Clinical Relevance of Stroke

• Oropharyngeal Dysphagia leads to
  • Reduced patient satisfaction
  • Increased length of time spent NPO
  • Longer hospital stays
  • Increased mortality rates [3].
Clinical Relevance of Stroke

- Persistent oropharyngeal dysphagia can increase the risk of:
  - dehydration [4]
  - malnutrition [4]
  - persistent disablement and [4,5,6]
  - aspiration pneumonia [4,7]
Clinical Relevance of Stroke

• Site of Lesion
  – The location of the stroke does not appear to assist in aspiration risk assessment.
  – McCullough et al noted in a series of 160 patients:
    • Bilateral subcortical stroke
    • Unilateral and bilateral stroke patients. [1]
Clinical Relevance of Stroke

- Stellars et al
- Age >65 years
- Dysarthria or no speech due to aphasia,
- Modified Rankin Scale ≥4
- Abbreviated Mental Test Score <8
- Failed bedside progressive water swallow test.
- Two or more of these factors correctly predicted pneumonia with 90.9% sensitivity and 75.6% specificity.
II. Swallow Disorders by Site of Lesion
Lower Brainstem (Medulla)

- Oropharyngeal swallow impairment:
  - Reduced hyolaryngeal excursion
  - Absent pharyngeal swallow
  - Pharyngeal weakness [8]
High Brainstem (Pontine) Stroke

- Hypertonicity
- Delay or absent pharyngeal swallow
- Unilateral pharyngeal wall paresis
- Reduced hyolaryngeal excursion
- Severe cricopharyngeal dysfunction

**Brain Stem**

- Midbrain
- Pons
- Medulla oblongata

Rigidly programmed automatic behavior necessary for survival. Passageway for fiber tracts running between cerebrum and spinal cord. Heavily involved with innervation of face and head (10 of the 12 cranial nerves attach to it).
Subcortical Stroke

- Motor and sensory pathways
- Mild delay:
  - Oral transit time
  - Pharyngeal swallow trigger
- Decreased hyolaryngeal excursion
- Occasional tongue base
Cerebral Cortex Stroke

- **Left cortical**
  - Oral transit delay
  - Mild delay in triggering the swallow
- **Anterior left hemisphere**
  - Apraxia of the swallow
- **Right hemisphere**
  - Mild oral transit delay
  - Pharyngeal delay
  - Hyolaryngeal excursion delay
IMED Acute Stroke (ASERT 1) Emergency Department Protocol

**Patient arrives by private vehicle**

**Signs and Symptoms of Stroke**
- Last Seen Normal < 8 hours and symptoms present on arrival
- Last seen normal > 8 hours OR symptoms completely resolved prior to arrival (refer to ASERT 2 protocol)

**Patient arrives by bystander**

**EMS assessment and transport**
- EMS to call ahead and activate ASERT 1 if last seen normal < 8 hours AND positive Cincinnati score

**Weigh patient on leg on the way to the room**

**Take immediately to ED room**
- ED physician determines ASERT level

**ED MD, RN & Tech**
- Respond to room and assess patient:
  - NPO, PMH, medications
  - Last seen normal time
  - Vitals
  - CBC, Blood glucose
  - STAT ENRO, creatinine
  - Labs
  - 11 lead EKG
  - Platelets, if needed

**ED PUC**
- Initiate Text and overhead pages per MD or RN instructions
- Order imaging, Labs, EKG

**Pharmacist**
- Obtain/Review patient’s medication history
- Review IV/IVR contraindications
- Calculate IV/IVR dose
- Enter IV/IVR order in computer, if applicable

**Neurologist & Neuro PAC**
- Confirms last seen normal time
- Performs neurological exam, including NAMPS
- Confirms past medical history
- Reviews IV/IVR contraindications
- Reviews IV/IVR risk/benefits with patient and/or family

**Give T-PA**

**Hemorrhage on CTP**
- Yes
- No

**Consider for acute intervention?**
- If IV/IVR, consider endovascular therapy

**Neurovascular therapy**
- Neuroradiologist performs procedure
  - IV/IVR, if NECTA or ASERT 2

**Further management as determined by neurologist and ED physician**

**IMED ED ASERT version 3 - 9/13/2013**
III. Dysphagia Assessment

Bedside Swallow Evaluation

• Using various consistencies to assess overt signs of aspiration.
  – Look at the strength and movement of muscles involved in swallowing.
  – Observe feeding posture, behavior and eating and drinking.
  – Presentation of thick & thin liquids,
  – Puree & solid consistency.
Signs or symptoms

Bedside
- Coughing during or immediately after eating
- Delayed throat clear after eating
- Wet or gurgly sounding voice
- Extra effort or time needed to chew or swallow
- Food or liquid leaking from the mouth
- Regurgitation of food after meal is finished
- Poor tolerance of secretions
- Weak cough
- Spike in temperature/white count
- Increased respiration rates
- Decrease in O2 saturation rates
Bedside Swallow Evaluation

• Sensitivities for aspiration near 80 percent.
• Specificities for aspiration near 70 percent.

• Low pneumonia rates observed in dysphagia management programs
• These exams are capable of detecting most aspiration, even silent aspiration.[9]
Dysphagia Assessment
Modified Barium Swallow (MBS)

Fiberoptic Endoscopic Evaluation of the Swallow (FEES)
MBS and FEES
Fiberoptic Endoscopic Evaluation of the Swallow (FEES)
Fiberoptic Endoscopic Evaluation of the Swallow (FEES)
Fees

- **Pros**
  - Completed at the bedside
    - ICU, isolation precaution, patients with weakened immune
  - Observe vocal folds, secretions and quality of tissue
  - Less expensive – no radiologist

- **Cons**
  - Invasive
  - Unable to complete if INR > 2.0
  - Unable to see oral or esophageal phase
  - “Whiteout” during the swallow
MBS - Normal Swallow
MBS - Disordered Swallow
MBS

• Pros
  – Observe oral, pharyngeal and esophageal phase
  – Observe nasal regurgitation
  – Not invasive

• Cons
  – Radiation exposure
  – Transfer patient to radiology suite
  – Unable to see secretions, vocal fold movement or other laryngeal structures
  – Only observe when fluoroscopy is turned on
## Aspiration Penetration Scale

<table>
<thead>
<tr>
<th>Score</th>
<th>Description of Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Material does not enter airway</td>
</tr>
<tr>
<td>2.</td>
<td>Material enters the airway, remains above the vocal folds, and is ejected from the airway.</td>
</tr>
<tr>
<td>3.</td>
<td>Material enters the airway, remains above the vocal folds, and is not ejected from the airway.</td>
</tr>
<tr>
<td>4.</td>
<td>Material enters the airway, contacts the vocal folds, and is ejected from the airway.</td>
</tr>
<tr>
<td>5.</td>
<td>Material enters the airway, contacts the vocal folds, and is not ejected from the airway.</td>
</tr>
<tr>
<td>6.</td>
<td>Material enters the airway, passes below the vocal folds, and is ejected into the larynx or out of the airway.</td>
</tr>
<tr>
<td>7.</td>
<td>Material enters the airway, passes below the vocal folds, and is not ejected from the trachea despite effort.</td>
</tr>
<tr>
<td>8.</td>
<td>Material enters the airway, passes below the vocal folds, and no effort is made to eject.</td>
</tr>
</tbody>
</table>
National Dysphagia Diet
NDD1 - Pureed

• NDD1
  – Mod-Severe dysphagia & poor oral phase abilities
  – All food is pureed
NDD2 - Mechanically Altered

- NDD2
  - Mild-Moderate dysphagia
  - Moist, soft, minced or ground

Food is soft, moist and easily mashed with a fork; lumps are smooth and rounded.
NDD3-Advanced

- NDD3
  - Mild dysphagia, foods require more chewing ability
  - Moist/soft food in “bite sized” pieces
Regular Diet

The end goal for all patients!
Liquid Level

Nectar Thick
Fluid runs freely off the spoon but leaves a mild coating on the spoon

Honey Thick
Fluid slowly drips in dollops off the end of the spoon

Spoon Thick
Fluid sits on the spoon and does not flow off it
## SWALLOWING EXERCISES

**Patient:** ___________________________  **Date:** ____________

Complete the following checklist exercises _______ times per day, ________ repetitions each. All exercises should be completed in the absence of food and/or drink.

### Throat Exercises
- **Effortful swallow:** Press the body of your tongue up against the roof of your mouth. Holding this position tense your neck muscles and swallow hard.
- **Mendesohn:** Start your swallow, hold your voice box in the up position for three seconds, and then finish your swallow.
- **Valsalva:** Say “hut,” swallow and then exhale slowly.
- **Supraglottic:** Hold breath and swallow hard. Immediately following your swallow exhale and cough.
- **Super-Supraglottic Swallow:** Hold your breath while bearing down. Swallow hard. Immediately following your swallow exhale and cough.
- **Sing “ee” starting at the lowest note and slowly slide up the scale to your highest note. Hold for 10-20 seconds.**
- **Shaker:**
  - Lie on your back (without a pillow). Lift your head up and look at your toes. Hold for 30 seconds. Rest for 30 sec. Repeat 3 x.
  - Chin sit up—lie on your back (without a pillow). Lift your head up and look at your toes. Quickly relax your head. 30x
- **Modified Shaker Exercise:** Sit upright 90 degrees in a chair. Place the palm of your hand against your forehead. While applying pressure against your forehead attempt to move your head forward. Hold this position for 3-5 seconds.
- **Turn your head to the right and swallow hard.**
- **Turn your head to the left and swallow hard.**
- **Open your mouth wide, inhale, and pretend to yawn.**
- **Swallow with your mouth in an open position.**

### Tongue Base Exercises
- **Masako:** Place the tip of your tongue between your front teeth, hold gently and swallow.
- **Push the tongue hard against each cheek to make the cheek protrude. While doing this push back in the opposite direction with your finger.**
- **Pull your tongue back in your throat and gargle sound. Hold for 2-3 seconds.**
- **Press your tongue against the roof of your mouth as hard as you can for 3-5 seconds.**
Dysphagia Treatment

**Delayed or Absent Swallow**

- Thermal tactile stimulation
- Suck-swallow
- Positioning
- Sensory characteristic
  - Sour
  - Cold vs hot
  - Volume
  - Carbonation [8]
Iowa Oral Performance Instrument (IOPI)

- Measures tongue and lip strength
- Measures oral motor endurance
- Deciding
- Assessing
Surface Electromyography (EMG)

- Used to measure the timing and amplitude of muscle contractions via electrodes
- Biofeedback
- Relaxation
- Coordination
- Muscle recruitment
Neuromuscular Electrical Stimulation (NMES)

- Use of electrical current to stimulate the nerves or nerve endings that innervate muscle beneath the skin [12]
Dysphagia Treatment

- Compensatory positioning strategies
- Diet Modifications
- Therapeutic Feeding
- Patient & Family Education
Thank you!
References