University of Florida Health
Speech-Language Pathology Evaluation
Videofluoroscopic Swallowing Study

Date:

Patient Name:
MRN:
Status: Inpatient, Outpatient, Inpatient Rehab, etc
Age:
Gender:

Reason for Study: Dysphagia
Referring Physician:
Evaluating Clinician:

MEDICAL HISTORY

Primary Medical Diagnosis:
History of Present Illness:
Current Medications:
Food/Drug Allergies:

Social History
Current (pre-evaluation) Intake/Diet:

Route: PO, PEG, NGT, NDT, TPN, etc.
Diet Grade: Regular, Mechanical Soft, Puree, Clear/Full Liquid, NPO
Liquid Consistencies: Thin, Nectar, Honey
Pre-Study Functional Oral Intake Scale (FIOS):

Patient Self-Perception Rating Forms:

- M.D Anderson Dysphagia Inventory (MDADI)
- Dysphagia Handicap Index (DHI)
- Eating Assessment Tool (EAT-10)

- Pain Scale:
- Barriers to Learning:

SUBJECTIVE

Things I comment on:

- Patient's overall level of alertness, and level of participation/engagement in evaluation
- A brief sentence on whether this is the initial evaluation, or a repeat study following 8 weeks of therapy, for example.
- I also include how well the patient has participated in structured therapy

OBJECTIVE

Tracheostomy Tube Present: #6 Shiley cuffless trach, PMSV on/off during evaluation.
Patient Positioning: Seated 70-90 degrees
Viewing Plans: Lateral, AP, Oblique
Contrast: Barium viscosities were used and graduated from thin liquid to pudding consistency and were administered via teaspoon, 5 ml boluses and by cup or straw in single and sequentially

swallowed boluses. Solid evaluated with graham cracker and approximately 2ml barium pudding coating.

OBJECTIVE ANALYSES OF SWALLOWING

Objective Analysis of Swallowing – Temporal Swallowing Kinematics

Each of the videofluoroscopy swallowing clips underwent objective analyses which included frame-by-frame analyses of swallowing kinematics to determine pathophysiology. All physiological variables that were measured were compared to published normative data (Anderson et al., 2015; Humbert, Lokhande, Christopherson, German, & Stone, 2012; Molfenter & Steele, 2012). Frame ranges below are based on fluoroscopy capture rate of 30 frames/second.

Specific measures of swallow reaction time (SRT) duration of laryngeal vestibule closure (dLVC), and duration to laryngeal vestibule closure (dtLVC) were used during this objective analysis given airway invasion during the swallow.

**indicates impairment
WNL=Within Normal Limits

Swallow Reaction Time (SRT): The time between the head of the bolus passing the ramus of the mandible (bolus head in pharynx) and the first superior and/or anterior burst of motion of the hyoid (hyoid burst).

Normal Range: -220 to 540 msec
Patient: *Cup sip thin liquid*: Trial 1: 30 msec; Trial 2: 60 msec; Trial 3: 30 msec (WNL)

Duration of Laryngeal Vestibule Closure (dLVC): The time between the first frame of laryngeal vestibule closure (LVC) and the first frame of laryngeal vestibule opening (LVO).

Normal Range: 310 to 1070 msec
Patient: *Cup sip thin liquid:* Trial 1: 360 msec; Trial 2: 450 msec; Trial 3: 450 msec (WNL)

****Duration to Laryngeal Vestibule Closure (dtLVC) – *Hyoid Burst:*** The time between hyoid burst and the first frame of laryngeal vestibule closure (LVC).

Normal Range: 198 to 363 msec
Patient**: Cup sip thin liquid:** Trial 1: 600 msec; Trial 2: 600 msec; Trial 3: 660 msec (IMPAIRED)
Cup sip thin liquid w/effortful swallow): Trial 1: 180 msec; Trial 2: 180 msec WNL

In addition to the objective swallowing events, subjective swallowing events were scored according to the Modified Barium Swallow Impairment Profile (MBSImP).

ORAL PHASE
**Lip Closure: Escape beyond mid-chin
Tongue Control during Bolus Hold**: WNL -** Cohesive bolus between tongue and palatal seal
Bolus preparation and mastication: **N/A -** Did not provide solid bolus
**Bolus transport/Lingual motion: Repetitive/disorganized tongue motion
**Oral Residue: Reside collection on oral structures: tongue, palate, floor of mouth
Initiation of Pharyngeal Swallow: WNL **– WNL -** Bolus head at posterior angle of ramus *(swallow reaction time WNL, see above)*

PHARYNGEAL PHASE
Soft palate elevation: **WNL -** No bolus between soft palate and pharyngeal wall
Laryngeal elevation: **WNL -** Complete superior movement of thyroid cartilage with complete approximation of arytneoids to epiglottic petiole
Anterior hyo-laryngeal excursion: **WNL -** Complete anterior movement
Epiglottic inversion: **WNL -** Complete inversion
Laryngeal Vestibule Closure (LVC): **WNL -** Complete: no air/contrast in laryngeal vestibule *(duration of LVC and LVC reaction time also WNL, see above)*
Pharyngeal stripping wave: **WNL -** Present – Complete
Pharyngeal contraction in AP view: Not Tested
UES opening: **WNL** – Complete distention and complete duration, no obstruction of flow
**Tongue base retraction: Narrow column of contrast between tongue base and
**Pharyngeal residue: Residue collection in valleculae (moderate)
Esophageal Clearance (upright): **WNL -** Complete clearance; esophageal coating

OVERALL ASSESSMENT

Should include:
1. Description of physiology
2. Presence of laryngeal penetration/aspiration (described as a consequence of disordered physiology)
3. Mode of delivery methods
4. Compensatory strategies used and the effectiveness of strategies

Patient's oral phase is characterized by significant anterior loss of thin liquids with spillage consistently past mid chin with cup sips due to inadequate lip closure. Patient is able to compensate by tilting his head back to aid in oral control and alleviate anterior loss. During bolus hold of thin liquid patient is able to adequately contain thin liquid in his oral cavity preventing premature spillage of thin liquids to the pharynx; however, he does have some loss of bolus to the floor of mouth, in the setting of partial glossectomy compromising his lingual control and range of motion. Patient's lingual deficits also result in mildly prolonged A-P transit and thus mild-moderate oral residue post swallow.

Once the swallow is initiated, patient has timely swallow initiation with all consistencies. Although he is able to achieve complete closure of the laryngeal vestibule, his closure is delayed (approximately 200-300 msec longer than normal range) resulting in penetration during the swallow with single cup sip of thin liquid (PAS 3). On one swallow of a cup sip of thin liquid the patient penetrated during the swallow to the level of the vocal folds, and approximately 3 seconds following completion of the swallow there was subsequent aspiration. Patient made no attempts to clear material that had reached the vocal folds (PAS 8), however he did report a slight urge to cough when asked if he "felt anything in his airway" post-swallow. This was the only instance of aspiration during the swallow study. In the remaining thin liquid cup sips, the patient was instructed to perform an effortful swallow. Using this strategy, the patient increased his laryngeal closure reaction time by ~500 msec, increasing airway protection and eliminating penetration (PAS 1). Pt performed 7 swallows of cup sips of thin liquid using this strategy to ensure consistency and accuracy across trials.

Given the patient had reduced tongue base retraction, there was mild-moderate residue in the valleculae only with the puree bolus. However, patient provided a thin liquid wash using effortful swallow which cleared residue from valleculae to a thin coating. No penetration nor aspiration with all trials of nectar-thick liquid, puree, or graham cracker.

PLAN

Recommended Diet Grade: Regular Solids
Recommended Liquid: Thin Liquid with use of effortful swallow
Post-Study Functional Oral Intake Scale (FOIS):

Therapy Recommendations:
Therapy will be continued
Frequency per week: 1
Number of Weeks: 4

The following therapeutic exercises will be part of the upcoming therapy/management plan:

Prognosis for Improvement:

Long Term Goals:

Short Term Goals:

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Speech Language Pathologist

Anderson, C., Macrae, P., Taylor-Kamara, I., Serel, S., Vose, A., & Humbert, I. A. (2015). The perturbation paradigm modulates error-based learning in a highly automated task: outcomes in swallowing kinematics. *J Appl Physiol (1985), 119*(4), 334-341. doi:10.1152/japplphysiol.00155.2015

Humbert, I. A., Lokhande, A., Christopherson, H., German, R., & Stone, A. (2012). Adaptation of swallowing hyo-laryngeal kinematics is distinct in oral vs. pharyngeal sensory processing. *J Appl Physiol (1985), 112*(10), 1698-1705. doi:10.1152/japplphysiol.01534.2011

Molfenter, S. M., & Steele, C. M. (2012). Temporal variability in the deglutition literature. *Dysphagia, 27*(2), 162-177. doi:10.1007/s00455-012-9397-x