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Diagnosis & Treatment of Complex Cases in Speech-Language Pathology

This series is presented in partnership with Rush University Medical Center

Guest Editor: Richard Peach, PhD, CCC-SLP, BC-ANCDS
Dysphagia Prevention and Rehabilitation in Head and Neck Cancer

Presenter: Lisa LaGorio, PhD, MPH, CCC-SLP

Moderated by:
Amy Natho, M.S., CCC-SLP, CEU Administrator, SpeechPathology.com

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Disclosures

- Current Financial
  - Assistant Professor, Rush University Medical Center

- Current Non-Financial
  - Associated Faculty with the Swallowing Research Lab of Dr. Michael Crary and Dr. Giselle Carnaby
    - Aarthi Madhavan, PhD Candidate
  - Past Financial Related to this talk:
    - NCI grant
    - FL Bankhead–Coley grant
    - American Cancer Society grant
Learning Objectives

After this course, participants will be able to:
1. Describe the current research supporting the use of prophylactic exercises during radiation therapy.
2. Describe how to complete a standardized clinical swallowing evaluation for H/N cancer patients.
3. Identify the physiologic swallowing differences/dysfunctions common to head and neck cancer patients following radiation therapy.
4. Implement a dysphagia rehabilitation program for H/N cancer patients.

Today’s Talk...

› Dysphagia in H/N
› Dysphagia Assessment
   ◦ Specialized Clinical Evaluation
› Dysphagia Prevention
› Dysphagia Rehabilitation
› Case Studies
Cancer... Some global numbers...

  - 14 million new cases in 2012
  - 8.2 million deaths in 2012
  - ~70% increase over next 20 years
    - 22 million/year within the next 20 years

[Link to WHO report](http://www.who.int/mediacentre/factsheets/fs297/en/)

USA Age-adjusted incidence rates, 2011

[Graph showing top 10 cancer sites for males in the United States](http://www.cdc.gov/uscs/)
Risk Factors—H/N Specific

- Smoking
- Drinking
- Social Isolation
- Low SES
- Medical Co–Morbidities
- GERD
  - Barrett’s Esophagus
- Diet
- Particle inhalation

- Human Papilloma Virus (HPV)
  - ~70% of all new oropharyngeal cancers are due to HPV

[link to CDC HPV statistics]

Medical Treatment for H/N Cancer

- Surgical
- Radiation Therapy (XRT)
- Radiation + Chemotherapy (CRT)

- Multi-disciplinary care:
  - MD (ENT, Radiation Oncology, Hematology, Pathology)
  - Dentist (Specialist in Oral Medicine)
  - RN
  - Dietician
  - Psychosocial (LCSW, Psychologist, Psychiatrist)
  - Rehab (PT, OT, SLP)
  - Alternative Medicine (homeopathy, acupuncture, massage, dance, art)
  - Clergy
  - Caregiver
Dysphagia in H/N Cancer

- Tumor/Disease Related Dysphagia
  - Pre-Treatment

- Treatment-Induced Dysphagia
  - Surgical
  - Radiation Effects:
    - During Treatment
    - After Treatment
  - Common Radiation Effects/Co-Morbidities:
    - Xerostomia
    - Mucositis
    - Chemosensory Change
    - Lymphedema

Radiation-Related Functional Swallowing Trajectory
Swallowing Problems

- **Oral Prep/Oral**
  - Reduced lingual ROM & strength
    - Bolus control issues
    - Lingual propulsion issues
    - Loss of bolus anteriorly, posteriorly, laterally
    - Longer oral transit time
  - **Pharyngeal**
    - Delayed pharyngeal response
    - Decreased hyolaryngeal excursion
    - Decreased velar closure → nasal bolus flow
    - Decreased BOT retraction
    - Decreased epiglottis movement—sometimes none
    - Decreased laryngeal vestibule closure

Swallowing Problems

- **Esophageal**
  - PES/UES relaxation issues
  - Possible proximal stricture/stenosis
  - More prevalent if UES area was in radiation field OR if large neck dissection in that area
    - Agarwalla et al, 2015

  ↓ Spontaneous Swallowing Frequency

  - Resulting in:
    - Weight Loss
    - Compensatory Strategies
    - Modified Diets
    - PEG Dependency
Dysphagia Trajectory

- Up to 90% with some level of clinical dysphagia requiring modified diets at completion of chemo/radiotherapy
- Dysphagia persists after 3 months
- Dysphagia can persist for years after
  - Hutcheson et al., 2015

WHY?

- Why is Dysphagia an on-going issue long after the cancer has been eradicated?
- What is Radiotherapy doing?
  - Is it only Fibrosis?
Oral Morbidities & Dysphagia

- Crary et al., ASHA, 2013
- N = 32
- Outcomes:
  - Swallowing/Dysphagia
  - Taste
  - Smell
  - Xerostomia
  - Mucositis
- 3 Assessment time points: BL, Post, 3 month
H/N Swallowing Evaluation

Evaluation Timing

Pre-Op | Post-Op Acute Care | Pre-Radiation | During Radiation

Post Radiation:
- Immediately
- 1 month
- 3 months
- 6 months
- 1 year
- Annually for life?
Evaluation Components

- Standardized Clinical Evaluation
- Standardized Instrumental Evaluation
- Functional Measure(s)
- Patient Reported Outcomes (PROs)
  - Visual Analog Scale (VAS)
  - Quality of Life (QOL)

Standardized Clinical Evaluation

- Oral Motor Exam
- Xerostomia
- Mucositis
- Chemosensory Changes
- Trismus Measurements
- Weight / Weight Loss
- Lymphedema Screening

- Tongue Pressure Exam/Measurements?

- Standardized Clinical Exam: MASA–C
The MASA–C

- Based on the Mann Assessment of Swallowing Ability (MASA)
- 24 items; 200 Points; Scores $\leq 185$ indicate dysphagia
- Multiple H/N cancer specific items:
  - Neck Palpation
  - Jaw Opening
  - Taste
  - Smell
  - Current Diet/Modified Diet
  - Mucositis
  - Xerostomia
  - Weight Loss

*Carnaby & Crary, 2014*

**MASA–C Example**

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>4</th>
<th>8</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neck Palpation</strong></td>
<td>Very marked density, retraction &amp; fixation</td>
<td>Definitely increased density and firmness</td>
<td>Just palpably increased density</td>
<td>NAD</td>
</tr>
<tr>
<td><strong>Mouth Opening</strong></td>
<td>$&lt; 15$ mm</td>
<td>16-30 mm</td>
<td>31-45 mm</td>
<td>$&gt; 45$ mm</td>
</tr>
<tr>
<td><strong>Taste</strong></td>
<td>No taste</td>
<td>Reduced Taste</td>
<td>5</td>
<td>NAD</td>
</tr>
<tr>
<td><strong>Smell</strong></td>
<td>No smell</td>
<td>Reduced Smell</td>
<td>5</td>
<td>NAD</td>
</tr>
<tr>
<td><strong>Current Diet</strong></td>
<td>Tube Dependent</td>
<td>Modified diet or fluids (including oral supplements only)</td>
<td>Normal diet; no restrictions</td>
<td>5</td>
</tr>
</tbody>
</table>
## WHO Oral Mucositis Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (none)</td>
<td>None</td>
</tr>
<tr>
<td>I (mild)</td>
<td>Oral soreness, erythema</td>
</tr>
<tr>
<td>II (moderate)</td>
<td>Oral erythema, ulcers, solid diet tolerated</td>
</tr>
<tr>
<td>III (severe)</td>
<td>Oral ulcers, liquid diet only</td>
</tr>
<tr>
<td>IV (life-threatening)</td>
<td>Oral alimentation impossible</td>
</tr>
</tbody>
</table>

NOTE: For us, the overall mucositis rating is based on BOTH tissue AND patient pain perception.


http://www.prothelial.com/images/pix7.JPG
Trismus Evaluation

http://www.therabite.co.uk/B_IdentifyingTrismus4.html

http://www.oralcancerfoundation.org/complications/trismus.php

Standardized Instrumental Exam

- Videofluoroscopy
  - MBSImp Procedure and Scoring Protocol
  - Assess for UES function/dysfunction
  - Assess for proximal esophageal stricture/stenosis

- FEES
  - Edema Rating
**Functional Oral Intake Scale**

- Level 1: Nothing by mouth
- Level 2: Tube dependent with minimal attempts of food or liquid
- Level 3: Tube dependent with consistent oral intake of food or liquid
- Level 4: Total oral diet of a single consistency
- Level 5: Total oral diet with multiple consistencies, but requiring special preparation or compensations

- Level 6: Total oral diet with multiple consistencies without special preparation, but with specific food limitations
- Level 7: Total oral diet with no restrictions

*Crary et al, 2005*

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**Visual Analog Scale (VAS)**

- Swallowing Perception
- Pain
- Fatigue
**HR–QOL**

- General
  - SF–36 (has 8 sub–scales; considered the “foundational” HR–QOL tool)

- Cancer Specific
  - Functional Assessment of Cancer Therapy–General (FACT–G)

- H/N Cancer Specific
  - FACT–H&N
  - U of Washington QOL–R (UW–QOL–R)
  - Head and Neck Cancer Inventory (HNCI)

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**HR–QOL Swallowing**

- General:
  - SWAL–QOL
    - Sydney Swallowing Questionnaire (SSQ)

- H/N Cancer Specific:
  - MD Anderson Dysphagia Inventory (MDADI)
    - European Quality of Life Scale (EORTC QLQ–C30)
Dysphagia Rehabilitation

Dysphagia Rehabilitation Timing

- Traditional:
  - Radiated tissue is too fragile, so, do nothing during the radiation therapy period
  - Place PEG prophylactically
  - Start therapy (compensations and/or exercises) after radiation therapy has been completed, and only when the patient has aspiration

- Paradigm Shift:
  - 2001: The start of the “Pharyngocise” dysphagia prevention studies
    - Exercise/Therapy during the radiation therapy period
Exercise-Based Dysphagia Prevention

Goal:
- Minimize the long-term effects of radiation on swallowing function

Rationale:
- Skeletal muscle responds to functional demand
  - “Plasticity”
- Muscles atrophy rapidly from immobilization
  - “Use it or lose it”
- Resistive exercise helps muscle strength and function recovery
- Prophylactic exercise facilitates maintenance of oropharyngeal muscle function

Other Types of Studies
- 2006, Kulbersh, et al.
  - Prospective Cohort study, n = 37
  - Retrospective case control, n = 18
- 2011, Van der Molen, et al.
  - Parallel arm w/ embedded Case-Control, n = 49
- 2013, Duarte, et al.
  - Retrospective case series, n = 85
- 2013, Hutcheson, et al.
  - Retrospective Observational, n = 497
- 2014, Ohba, et al.
  - Retrospective case-control, n = 51
- 2014, Cnossen, et al.
  - Multi-modal delivery, n = 34
- 2014, Van der Molen, et al.
  - Parallel arm, n = 29
- 2015, Virani, et al.
  - Parallel Arm, n = 50

Randomized Control Trials
- 2012, Carnaby-Mann, et al.
  - n = 58
- 2012, Carnaby, LaGorio, et al.
  - n = 130
- 2012, Kotz, et al.
  - n = 26
- 2015, Mortenson, et al.
  - n = 44

2015, Schindler et al., European Consensus Document

The Evidence:
Carnaby-Mann, 2012 #1
The “Pharyngocise” Studies
- RCT
  - Pharyngocise, Sham Exercise, Traditional Care (control)
  - N = 58
- Pharyngocise = Falsetto, Tongue Press, Hard Swallow, Jaw Stretch with TheraBite
- Assessment Time Points:
  - BL, Post, 6 months
- Outcomes:
  - T2 weighted MRI of swallowing musculature
  - Swallowing Ability (MASA)
  - FOIS
  - Chemosensory function
  - Saliva
  - Trismus
  - Weight Loss
- Results:
  - Post:
    - Any Exercise: Geniohyoid, mylohyoid, hyoglossus showed less deterioration than the control group
    - Pharyngocise: Less deterioration in MASA, FOIS, taste decline, smell decline, weight loss, mouth opening
      - Better outcomes than traditional care

Carnaby-Mann, 2012, #2
“Pharyngocise” Dose–Response Study
- RCT
  - Clinician-Directed; Patient-Directed; Traditional Care (control)
  - N = 130
- Assessment Time Points:
  - BL, 6 weeks, 3 months
- Outcome Measures:
  - MASA-C
  - FOIS
  - PEG dependency
  - Weight Loss
  - QOL
- Results:
  - Any exercise better than no exercise across all outcomes
  - Clinician-directed results in better outcomes than patient-directed therapy across
  - 90+ exercise cycles was necessary for best outcomes
Hutcheson, et al., 2013

- Retrospective Observational Study
- N = 497

Outcomes:
- Final diet at end of radiotherapy
- PEG dependence
- Exercise Adherence

“Eat” AND “Exercise”
- Exercises:
  - Modified Shaker
  - Jaw Stretch
  - Supraglottic/Valsalva
  - Falsetto
  - Lingual protrusion/retraction
  - Yawn, Gargle
  - Masako
  - Effortful swallow

Results:
- 3 Groups: Non-compliant (13%), Partially Compliant (64%), Fully Compliant (24%)
- ↑ Compliance → ↑ Oral diet
  - Non-Compliant = 65%; Partial = 77–84%; Full = 92%

The Challenge...

- ↑ Exercise → ↑ Swallowing and ↑ QOL

Patient Adherence to the exercises
- ~ 15–80% fully compliant

Shinn et al, 2013:
- N = 109; adherence data on 65:
- 58% never tried the exercises!!!
- WHY NOT?
  - Lack of understanding the importance (SLP issue?)
  - Radiation side effects interfered (disease burden)
Dysphagia Rehab Post Radiation

› No standardized dysphagia rehabilitation practice
  ◦ Krisciunas, et al., 2012, Survey of SIG 13, n = 759

› When should we intervene?
  ◦ Hutcheson et al., DRS, 2015, n = 57
    • While most (91%) regained function w/in 1 year; the remainder still had dysphagia for 6+ years; 3 had lower cranial neuropathy
  ◦ Langmore et al, DRS, 2015, n = 170
    • Dysphagia worsens over time
      • Better outcomes when therapy provided earlier than 6 months after XRT, than with therapy several years later.

Dysphagia Rehab Post Radiation

› Traditional Approach (Krisciunas 2012 survey)
  ◦ Compensations (90.1%)
  ◦ Stretches (68.4%)
  ◦ Non-swallow exercises (83.9%)
  ◦ Swallow exercises (83.0%)
  ◦ Other (39.8%)
Dysphagia Rehab Post Radiation

- Non-Traditional Approaches
  - MDTP?
    - Crary, et al., 2010
  - Respiratory-Swallow training?
    - Martin-Harris et al., 2015
  - Vital Stim?
    - Krisciunas et al., 2015
  - CTAR?

- May need cervical esophagus dilation
- May need UES denervation

Future Directions

- Pharyngocise Study—longer term outcomes
- Prevention Exercises with Adjunctive Modalities
  - Tongue Strengthening (IOPI, MOST/I-Pro, Swallow Strong)
  - Chin Tuck to Resistance (CTAR)
- Taste Studies
- MDTP Studies
- Other Rehabilitation Studies
- QOL studies, including the Caregiver
  - Nightingale, et al., 2014
  - Lee et al., 2015
What are we doing at Rush?

- Clinic Protocol:
  - Dedicated SLP H & N team
  - All patients get assessed at multiple time points
    - Acute and OP
  - All patients are taught Pharyngocise at start of Radiotherapy
  - Follow-up informally weekly, formally Bi-Weekly during radiotherapy
  - On-going evaluation at all routine follow-ups
  - Dilation as indicated
  - MDTP Rehabilitation

- Research:
  - Tongue Strengthening protocols using adjunctive modalities
  - Effects of TORS on dysphagia outcomes

Take Home Messages

- Dysphagia persists—often for years
  - Multi-faceted, and not just due to fibrosis
- Need to do a different type of clinical assessment
- Need to assess more often—possibly for life
- Need to intervene early for prevention
  - Need to stress the importance of prevention exercises now, and for life
- Need to intervene early for rehabilitation
  - Need to be aggressive in the therapy
Case Study #1
- 50 y/o male
- T3 SCCA BOT
- Trained in Pharyngocise, did exercises routinely
- Remained PO diet throughout XRT, but last 2 weeks was liquid only
- Mucositis Grade 2 at the end, PEG placed in last few days of XRT for supplementation, continued drinking water
- Continued Pharyngocise post XRT
- By 2 months, full regular diet

Case Study #2
- 40 y/o male
- T2 of the BOT
- Prophylactic PEG placed
- No SLP intervention for preventative exercises
  - Multiple MBSS’s, home exercise program, no therapy
- 1 year later—NPO, wanted therapy
- MDTP x 2 weeks → mechanical soft diet
- Referred for dilation
- Post–dilation, advanced to regular diet
Case Study #3

- 54 y/o male
- T3 SCCA of the tonsil
- No SLP intervention for H/N at any point
- Liquid diet
- 6 months after XRT, L CVA; PEG placed
- Traditional dysphagia therapy in Rehab
- Some progress → PEG + liquids for pleasure
- I did repeat VFSS → stricture
- S/P dilation
- MDTP x 5 sessions → Regular diet
- PEG removed
- 1 year later—doing great!

References


References


Hutcheson KA, Bhayani MK, ...Lewin, J. (2013). Use it or lose it: Eat and exercise during radiotherapy or chemoradiotherapy for pharyngeal cancers. JAMA Otolaryngology—Head & neck surgery, 139(11), 1127-1134.


References


