Clinical Management of Individuals Undergoing Organ Preservation Treatment

Donna Tippett, M.A., M.P.H.,1,2 Kimberly Webster, M.A., M.S.,1 Heather Starmer, M.A.,1 Lynn Reeni Rider, M.A.,1

1. Department of Physical Medicine and Rehabilitation
2. Department of Otolaryngology—Head and Neck Surgery

Learner objectives

- Demonstrate understanding of functional impact of organ preservation approaches on swallowing and voice
- Discuss the impact of toxicities on swallowing and voice
- Describe therapeutic interventions that may be beneficial
- Discuss current literature influencing clinical decision making

Terminology

- Organ preservation
- Organ conservation
- Primary radiotherapy
- Chemoradiation
- Induction chemotherapy
- Adjuvant chemo-/radiotherapy
- Neoadjuvant
- Combined modality
- Clinical trials and protocols
Our Protocol: Tumor Board Conferences

- Weekly
- Referrals
- Multidisciplinary
- Treatment planning

Our Protocol: Tumor Board Conferences

- Head and neck surgeons
- Reconstructive surgeons
- Medical oncologists
- Radiation oncologists
- Oral pathologists
- Oncology nurses
- Otolaryngology nurses
- Speech-language pathologists
- Dentists, prosthodontists
- Nuclear medicine radiologists
- (P.T., Nutrition, SW)

Multidisciplinary Care

- Blair & Callender, 1994
  - Collaboration and communication of multidisciplinary teams have had a profound effect on the treatment of head and neck cancer
  - "Essential for positive outcomes"
Multidisciplinary Clinics and Patient Satisfaction

• Walker et al, 2003
  – Overall satisfaction predicted by younger age, female gender and greater attention to how patients were coping with illness.

Our Protocol: Roles of the Speech-Language Pathologist

• Education
• Exercises
• Connections
• Support
• Swallowing
• Voice
• Speech
• Oral Health
• Research
• Functional Outcomes

Our Protocol: Pre-treatment Consultation

• Education re: expected changes
  – Speech
  – Voice
  – Swallowing
  – Oral health
• Dental care, oral hygiene and relation to aspiration and aspiration pneumonia
• Xerostomia alleviation and treatment
Our Protocol:
Pre-treatment Consultation

- Measurement of oral aperture and discussion of trismus
- Pre-treatment swallowing exercises
- Jaw range of motion exercises
- Referrals

Our Experience:
Subjects

- N = 53
  - Individuals with head/neck CA undergoing chemo/radiation
  - 42 men
- Race
  - 2 African-American
  - 1 Asian
  - 46 Caucasian
  - 1 Middle Eastern
- Mean age = 57.3 years (range 22-81 years)

Our Experience:
Subjects

- Primary site
  - Oropharynx: 50/53
  - Nasopharynx: 2
  - Unknown: 1
- HPV
  - Positive: 30/53
  - Negative: 9
  - Unknown/not tested: 14
Our Experience:
Pre-Treatment Status

- 30/53 (57%) denied pre-tx dysphagia
- Most frequent pre-tx complaints
  - Cough/choke (9/53, 17%)
  - Odynophagia (10/53, 19%)
  - Diet change (11/53, 21%)
- Infrequent complaints pre-tx
  - Nasal regurgitation (1/53, 2%)
  - Reduced oral control (2/53, 4%)
  - Trismus (5/53, 9%)
  - Weight loss (7/53, 13%)

Our Protocol: Pre-treatment
Swallowing Exercises

- Lingual resistance
- Straw resistance
- Mendelsohn maneuver
- Masako maneuver
- Effortful swallow
- “Sirening” technique
- Jaw range of motion

Pre-treatment Swallowing
Exercises

  - Cross sectional analysis of QOL to
determine efficacy of pre-tx intervention
  - Administered MDADI
  - N = 25 pre tx swallowing exercises
  - N = 12 post tx swallowing exercises
Pre-treatment Swallowing Exercises

• Kulbersh et al, 2006
  – Dysphagia protocol
    • Mendelsohn maneuver
    • Tongue hold
    • Tongue resistance
    • Falsetto phonation
    • Shaker exercises

Pre-treatment Swallowing Exercises

<table>
<thead>
<tr>
<th>Domain</th>
<th>Pre Tx</th>
<th>Post Tx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td>74.4</td>
<td>32.9</td>
</tr>
<tr>
<td>Emotional</td>
<td>72.1</td>
<td>53.9</td>
</tr>
<tr>
<td>Functional</td>
<td>68.7</td>
<td>58.6</td>
</tr>
<tr>
<td>Physical</td>
<td>66.4</td>
<td>43.2</td>
</tr>
</tbody>
</table>

Pre-treatment Swallowing Exercises

• Carroll et al, *Laryngoscope*, 2008
  – 18 patients with advanced squamous cell carcinoma of the oropharynx, hypopharynx, and larynx
  – 9 patients received pretreatment swallowing exercises prior to CRT
  – 9 patients received swallowing exercises during routine posttreatment management
Pre-treatment Swallowing Exercises

• Carroll et al, 2008
  – Outcome Measures
  – VFSS 3 months after posttreatment
    • Hyoid elevation, epiglottic inversion, tongue base movement, cricopharyngeal opening
    • PAS scores
  – PEG tube use was assessed at 12 months after treatment

Pre-treatment Swallowing Exercises

• Carroll et al, 2008
  – Patients receiving pre-treatment swallowing therapy
    • Epiglottic inversion was better maintained (p = .05)
    • BOT position during swallow was significantly closer to the PPW (p = .025)
  – PEG tube removal rates did not significantly differ between groups.

Our Experience: Post-Treatment VFSS Results

<table>
<thead>
<tr>
<th>Frequency of Impairment by Site</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Epiglottic tilt</td>
<td>39/53, 74%</td>
</tr>
<tr>
<td>Pharyngeal constriction</td>
<td>39/53, 74%</td>
</tr>
<tr>
<td>Pharyngeal clearance</td>
<td>39/53, 74%</td>
</tr>
<tr>
<td>Airway protection</td>
<td>30/53, 57%</td>
</tr>
<tr>
<td>Hyoid elevation</td>
<td>24/53, 45%</td>
</tr>
<tr>
<td>CP function</td>
<td>22/53, 42%</td>
</tr>
</tbody>
</table>
Our Experience:
Post-Treatment VFSS Results

• 2 patients presented no deficits on VFSS*
• 3 patients had esophageal strictures

Our Experience:
Post-Treatment Status

• Penetration-Aspiration Scale Scores

<table>
<thead>
<tr>
<th>PAS Scores</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

JC Rosenbek et al, 1996

Characteristics of Dysphagia

• Goguen et al, Otolaryngol Head Neck Surg, 2006
  – Prospective cohort study
  – N = 23 s/p CRT for head/neck SCCA
  – Common deficits
    • Decreased epiglottic tilt
    • Decreased BOT retraction
    • Decreased laryngeal elevation
    • Impaired bolus propulsion
    • Laryngeal penetration/aspiration
    • 14/23 pharyngoesophageal narrowing
### Characteristics of Dysphagia

**Dworkin et al., Dysphagia, 2006**
- Retrospective study
  - Performed FEES in individuals with Stage III/IV laryngeal SCCA
  - Multiple decompensations
    - Excess oropharyngeal secretions
    - Premature spillage into vallecula
    - Retention in vallecula
    - Post cricoid residue
    - Laryngeal penetration/aspiration

**Logemann et al., Head Neck, 2006**
- Examined differences in swallowing across tumor sites and CRT protocols
  - VFSS pre- and 3 months post tx
  - N = 53 with Stage III/IV head/neck SCCA
  - Common deficits
    - Reduced BOT retraction
    - Reduced tongue strength
    - Delayed laryngeal vestibule closure

**Pauloski et al., Head & Neck, 2006**
- Prospective cohort study
  - VFSS pre- and post tx
  - N = 170 with head/neck SCCA
  - Identified multiple decompensations
  - Limitations in oral intake and diet post tx were significantly related to:
    - Reduced laryngeal elevation
    - Reduced CP opening
    - Rating of nonfunctional swallow on at least 1 bolus type
Our Experience: Post-treatment Status and Recovery

<table>
<thead>
<tr>
<th>PEG at 3 Months</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAS score &gt;4</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td>PAS score ≤4</td>
<td>8</td>
<td>14</td>
</tr>
</tbody>
</table>

- Sensitivity = 72%
- Specificity = 61%
- PPV = 70%
- NPV = 64%
- OR = 4.1

Recovery

- Goguen et al, 2006
  - Prospective cohort study
  - F/u at 3, 6, 9, 12, 24 months post tx
  - N = 59
  - Primary tumor sites: oral cavity, oropharynx, hypopharynx, larynx

<table>
<thead>
<tr>
<th>Recovery</th>
<th>Months</th>
<th>% Soft or Regular Diet</th>
<th>% GT Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
<td>17</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>53</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>80</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>97</td>
<td>90</td>
</tr>
</tbody>
</table>
Recovery

- Dworkin et al, 2006
  - N = 14 with Stage III/IV laryngeal SCCA
  - <12 mos: 43% regular/near normal diet
  - >12 mos: 86% regular/near normal diet

<table>
<thead>
<tr>
<th>Diet Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular diet</td>
<td>3</td>
</tr>
<tr>
<td>Near normal diet</td>
<td>6</td>
</tr>
<tr>
<td>Puree</td>
<td>3</td>
</tr>
<tr>
<td>Gastrostomy tube</td>
<td>2</td>
</tr>
</tbody>
</table>

Recovery

- Pauloski et al, 2006

<table>
<thead>
<tr>
<th>Time Period</th>
<th>% with &lt;50% oral intake</th>
<th>% with non-normal diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-tx</td>
<td>5.1</td>
<td>37.8</td>
</tr>
<tr>
<td>1 mos post</td>
<td>39.5</td>
<td>74.4</td>
</tr>
<tr>
<td>3 mos post</td>
<td>25.9</td>
<td>63.6</td>
</tr>
<tr>
<td>6 mos post</td>
<td>19.1</td>
<td>56.0</td>
</tr>
<tr>
<td>12 mos post</td>
<td>12.5</td>
<td>40.3</td>
</tr>
</tbody>
</table>

Our Experience; Post-Treatment Status

- Trismus: 10/53, 19%
- Xerostomia present >6 mos post: 47/48, 98%
- PEG
  - Removed by 3 mos post: 23/53, 43%
  - Removed by 6 mos post: 32/51, 63%
Trismus

- Dijkstra et al, *Oral Oncol*, 2004
  - Prevalence 5% - 38% in head/neck cancer
  - Variation secondary to lack of uniform criteria, visual assessment, retrospective review

Criteria for Trismus

- Normal MIO 46+7mm

- MIO < 30 – 35mm

Treatment for Trismus

  - N = 21 s/p resection of oral SCCA and radiation tx <5 years

<table>
<thead>
<tr>
<th>Group</th>
<th>Net increase at 6 wks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercises</td>
<td>6.0mm (+/-1.8mm)</td>
</tr>
<tr>
<td>Tongue blades</td>
<td>4.4mm (+/-2.1mm)</td>
</tr>
<tr>
<td>Therabite</td>
<td>13.6mm (+/-1.6mm)</td>
</tr>
</tbody>
</table>
Treatment for Trismus

  – N = 7 s/p surgery for oropharyngeal SCCA

<table>
<thead>
<tr>
<th></th>
<th>MIO mm</th>
<th>12 - 48 wks post op</th>
<th>Initial</th>
<th>30 (24 – 38)</th>
<th>Final</th>
<th>40 (30 – 57)</th>
<th>p &lt; .01</th>
</tr>
</thead>
</table>

Treatment for Trismus

• Dijkstra et al, *Oral Oncology*, 2007
  – Retrospective study
  – N = 27 patients with trismus secondary to head/neck SCCA and 8 with trismus secondary to other dx
  – Treatment included
    • Active ROM
    • Hold relax techniques
    • Manual stretching
    • Joint distraction
    • Use of devices and tools

Trismus related to head/neck SCCA

<table>
<thead>
<tr>
<th>Mouth opening mean (SD)</th>
<th>19.3mm (7.4)</th>
<th>17.6mm (6.8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in mouth opening mean (SD)</td>
<td>5.5mm (6.0)</td>
<td>17.1mm (9.0)</td>
</tr>
</tbody>
</table>

p = .05
Xerostomia
Visual Inspection of the Mouth

- Tongue depressor sticks to buccal mucosa
- “Lipstick” sign
- Dry, sticky or erythematous oral mucosa
- Red patches on palate, tongue
- Decreased lingual papillae
- Little pooled saliva in FOM
- Stringy, ropy, foamy saliva

When residual gland function remains...

- Can recommend:
  - Fresh, light acidic fruits
  - Slices of cold cucumber, tomato, melon, apple
  - Sour tasting, sugarless candy
  - Chewing gum
  - Vitamin C tablets per MD approval
- Encourage routine and professional dental care

When saliva production cannot be stimulated...

- Can recommend
  - Frequent sips of water
  - Saline mouth rinse
  - Oral lubricants
  - Glycerin (may irritate oral mucosa)
  - Saliva substitutes
  - Room humidifier
    - Criswell et al, Laryngoscope, 2001: Vapotherm MT-3000
    - Biotene products
When saliva production cannot be stimulated…

• Can recommend changes in diet to avoid damage to fragile mucosa
  – Avoid dry, spicy foods
  – Avoid temperature extremes
  – Avoid alcohol, tobacco, caffeine, sugar containing products
• Encourage routine and professional dental care

Our Experience:
Conclusions

• More than half denied pre-treatment dysphagia
• PAS scores were primarily 1’s or 8’s
• Less than ¼ had trismus post-treatment
• Nearly everyone had xerostomia

Our Experience:
Conclusions

• Absence of pre-tx dysphagia is not predictive of post-treatment dysphagia
• Multiplicity of post-tx swallowing problems did not preclude P.O. intake during tx
• Almost half had GT removed by 3 mos
• Presence of GT is not an indicator of swallowing/PO status, although there was an association b/t aspiration and GT at 3 mos
Selected References


Questions?

THANK YOU VERY MUCH!