Dysphagia Management in Head and Neck Cancer

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Dysphagia Management in Head and Neck Cancer

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Learning Objectives

After this course, participants will be able to:
- Describe risk factors, signs and symptoms, and staging of head and neck cancer.
- List treatment options for head and neck cancer.
- Describe swallow evaluation and treatment procedures for patients before, during, and after treatment for head and neck cancer.
- List strategies for implementing prophylactic dysphagia therapy for patients undergoing chemoradiation for head and neck cancer.
- Describe management methods for the swallow-related side effects of treatment.

Head and Neck Cancer Estimated Statistics for 2015

- Accounts for 3% of all cancers in US
  - 6th most common cancer worldwide
- 59,340 people
  - 43,390 men
  - 15,950 women
- 12,290 US deaths will occur
- Most commonly Squamous Cell Carcinoma
What is Cancer?

- Begins as a cluster of cells multiplying out of control
- When the immune system can no longer resist the growth, local growth takes place
- Then the cells can penetrate into blood vessels and lymph vessel walls
- Metastasis: spread beyond original location:

TNM Staging System of the American Joint Committee on Cancer (AJCC)

T = Tumor (1-4) based on size of tumor, varies by site
N = Nodes (0-3) based on location and size of nodes
M = Metastasis (>2)

TNM stage is then combined into a grouping to assign an overall stage of I, II, III, or IV

Early Stage = Better survival

Oral Cavity Staging

<table>
<thead>
<tr>
<th>Primary Tumor (T)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>Primary tumor cannot be assessed</td>
</tr>
<tr>
<td>T1</td>
<td>No evidence of primary tumor</td>
</tr>
<tr>
<td>T1a</td>
<td>Tumor 2 cm or less in greatest dimension</td>
</tr>
<tr>
<td>T1b</td>
<td>Tumor more than 2 cm but not more than 4 cm in greatest dimension</td>
</tr>
<tr>
<td>T2</td>
<td>Tumor more than 4 cm in greatest dimension</td>
</tr>
<tr>
<td>T3</td>
<td>Tumor invades through cortical bone, inferior alveolar nerve, floor of mouth, or skin of face (i.e., skin or resectable palpable skin disease)</td>
</tr>
<tr>
<td>T4</td>
<td>Tumor invades through cortical bone, into deep (extrinsic) muscle of tongue (genioglossus, hyoglossus, palatoglossus, and styloglossus), mandible, sinus, or skin of face</td>
</tr>
<tr>
<td>T4a</td>
<td>Tumor involves masticator space, pterygoid plates, or skull base and/or causes internal carotid artery involvement</td>
</tr>
</tbody>
</table>

Nodal staging

Regional Lymph Nodes (N)

N0 Regional lymph nodes cannot be assessed
N1 No regional lymph node metastasis
N2 Metastasis in a single ipsilateral lymph node, more than 3 cm but not more than 6 cm in greatest dimension; or in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension; or in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension
N2a Metastasis in single ipsilateral lymph node more than 3 cm but not more than 6 cm in greatest dimension
N2b Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension
N2c Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension
N3 Metastasis in a lymph node more than 6 cm in greatest dimension

T3N2aMo  SCCA of the BOT

- What does that mean?
  - T3> 4.1 cm
  - N2a- Single ipsilateral lymph node 3-6 cm in size
  - Mo- No distant metastasis

- Stage IV cancer because it has spread to surrounding lymph nodes

Risk Factors for Head and Neck Cancer

- Tobacco use
- Frequent heavy consumption of alcohol
- HPV (oropharyngeal)
- Sun exposure
- Epstein Barr Virus (nasopharyngeal)
- Occupation exposure
- Radiation exposure
- Betel nut
- Marijuana use
- GERD
- Poor nutrition and oral hygiene
- Weakened immune system
- Ancestry
- Gender
- Age (over 40)

HPV

- Oropharyngeal carcinomas increased by 225% between 1988 and 2004
- Nearly 70% of new oropharyngeal cancers linked to HPV
- HPV Negative cancers
  - Associated with tobacco and alcohol
  - Decreasing with decreased tobacco use
  - Decreased survival
- HPV Positive cancers
  - Associated with increasing oral sex, more than 7 sexual partners, early age of sexual behavior, premartial
  - Increasing in incidence
  - Associated with increased survival
Signs and Symptoms

- Sore in mouth that does not heal
- Red or white patch in the mouth
- Lump, bump, or mass in the neck
- Persistent sore throat
- Chronic halitosis
- Change in voice
- Nasal obstruction or persistent nasal congestion or nose bleeds
- Pain or difficulty chewing or swallowing
- Ear and/or jaw pain
- Loosening of teeth
- Dentures that no longer fit
- Unexplained weight loss
- Fatigue

Multidisciplinary Team - Tumor Board

- Head and Neck Surgeon
- Radiation Oncologist
- Hematology Oncologist
- Radiologist
- Pathologist
- Dentist/Prosthodontist
- SLP
- Nutritionist
- Nursing
- PT, OT
- Social Services

Treatment Options Depend on Stage and Site of Disease but May Include

- Surgery alone
- Radiation alone
- Surgery Followed by Radiation Therapy (adjuvant)
- Chemotherapy and Radiation (CRT)
Types of Surgery

- TORS
- Resection with Primary Closure
- Resection with Local Closure
  - Tongue flap, buccal flap
- Resection with Regional Closure
  - PMC flap, SCM flap,
- Resection with Free Flap Reconstruction
  - RFFF, FFF, ALT, Scapula, etc.

Oral and Oropharyngeal Cancer

Laryngeal and Hypopharyngeal Cancer

- Laser surgery
- Robotic surgery
- Partial horizontal procedures
- Partial Vertical procedures
- Supracricoid laryngectomy
- Total laryngectomy
- Laryngopharyngectomy
Preservation of Form ≠ Preservation of Function

- Dysphagia is one of the major toxicities of organ preservation protocols for Head and Neck cancer.
  - Aspiration post treatment (23%–78%)
  - Feeding tube dependence (12%–64% at one year)
  - Decreased quality of life (persists for 12+ months)

Why?

- How does radiation affect swallowing?
- How does chemotherapy affect swallowing?
- What are the long-term effects of treatment?
- What can we do to manage side effect and eliminate long term deficits?
- Can therapy during and after treatment help prevent dysphagia and promote swallow related quality of life?

Radiation Therapy

- Provides small doses of radiation over a long period of time to destroy cancer cells while allowing the normal adjacent cells to repair from the injury.
  - Treatment:
    - Once a day 5 times a week
    - Usually lasts 5-7 weeks
    - Each treatment takes approx. 20 minutes and is painless
External Beam Radiation

- Three dimensional conformal radiotherapy (3D-CRT) combines multiple radiation fields to deliver precise doses to target area.
- Intensity Modulated Radiation Therapy (IMRT), a form of 3D-CRT that limits surrounding tissue exposure by modifying intensity of each radiation beam.

XRT Terminology

- Dose expressed in "Gray or Centigray"
  - 1 Rad = 1 cGy
  - 100 cGy = 1 Gy

  - Typical dose for head and neck cancer:
    - 900-1000 units per week
    - 180-200 units per day
    - Total dose usually 6000-7400 cGy (60-74 Gy)

Chemotherapy:

- Systemic medication to treat metastatic disease
- Usually given via IV but may be oral
- Targets most rapidly dividing cells in body including:
  - Cancer cells
  - Cells of gastrointestinal tract
  - Bone marrow
  - Hair cells

- Cisplatin, Carboplatin, Biologic Agents, Erbitux

- Chemotherapy when added to XRT heightens the effect of the treatment and also heightens the side effects.
Disorders Affecting Oral Stage of Swallowing During and After XRT/CRT

- Xerostomia
- Mucositis
- Dysgeusia
- Odynophagia
- Reduced oral sensation
- ORN
- Trismus
- Reduced strength and/or ROM of lips, tongue, or jaw
- Decreased appetite
- Edema
- Fibrosis
- Neuropathy
- Atrophy

Mucostis - painful ulceration and inflammation of the mucous membranes of the intestinal tract

- Very painful
- Neutralizing/soothing rinse- ½ tsp salt and 2 tsp baking soda in 4 cups of water
- ½ tsp baking soda in 8 oz of water
- Can be treated by MD with pain control meds or topical anesthetics
  - Magic Mouthwash
  - Vicous lidocaine
  - Caphexol

Xerostomia - dry mouth due to decreased salivary flow

Signs :
- Thick stringy secretions
- Increased thirst
- Altered taste
- Burning in mouth
- Cuts/Cracks in lips and tongue
- Changes in the surface of the tongue

Side effects of xerostomia
- Tooth decay
- Infection
- Bacterial
- Fungal
- Gum disease
- Oral and Pharyngeal stage dysphagia
- Difficulty articulating
- Vocal deterioration
Management of Xerostomia

- Drink water
- Humidify air
- Use saliva substitutes (sprays, gels, lozenges)
- Baking soda rinse
- Sugar free gum and candy
- Club soda
- Prescription medication (Pilocarpine)

Dental Care

- See dentist before beginning treatment
- Use daily fluoride treatments as prescribed
- Brush with extra soft toothbrush 3x/day
- Use alcohol free rinses
- Floss gently once a day
- Keep lips moist
- Lifelong risk post treatment

Disorders of Pharyngeal Stage Resulting from XRT/CRT

- Delayed swallow reflex
- Decreased elevation of soft palate
- Reduced strength and posterior motion of base of tongue
- Reduction of pharyngeal contraction
- Reduced epiglottic inversion
- Reduced hyolaryngeal excursion
- Reduced closure of airway entrance
- Reduced laryngeal and pharyngeal sensation
- Cricopharyngeal dysfunction
- Increased pharyngeal transit time
- Edema, Mucositis
- Atrophy
- Fibrosis
- Neuropathy
Post-XRT MBS

Disorders of Esophageal Stage Resulting from CRT

- Decreased hyo-laryngeal excursion to open CP segment
- Decreased relaxation of CP segment
- Poor pressure to drive bolus through the CP segment
- Esophageal stricture
- GERD
- Dysmotility

Early Post XRT FEES
Role of SLP Before XRT

- Establish swallowing/nutritional baseline
- Implement MB5 or FEES if indicated
- Discuss normal anatomy and physiology of the swallow
- Review CRT side effects
- Establish oral/dental hygiene program
- Family education and support throughout treatment
- Initiate prophylactic dysphagia exercise protocol

Prophylactic Swallowing Therapy

- Kraaijenga, et al 2014
- Kotz et al., 2012
- Van der Molen et al., 2009, 2011
- Bhanya, et al 2012
- Carroll et al, 2008
- Klibersh et al., 2006
Primary outcome measures
(6 weeks and 6 months)

- Muscle size, composition, and T2 reaction time determined by T2-weighted magnetic resonance imaging
  - Mylohyoid
  - Genioglossus
  - Hyoglossus
  - Pharyngeal constrictors

Results

- All muscle groups studied deteriorated muscle with treatment
- Greater preservation and less structural deterioration in pharyngocize group

  - Genioglossus
  - Hyoglossus
  - Mylohyoid

Secondary Outcomes at 6 weeks

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Usual Care</th>
<th>Pharyngocise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal diet (FOIS)</td>
<td>2/14</td>
<td>5/12*</td>
</tr>
<tr>
<td>Nonoral feeding</td>
<td>6/14</td>
<td>3/13*</td>
</tr>
<tr>
<td>Functional swallowing (MBS)</td>
<td>2/14</td>
<td>6/12*</td>
</tr>
<tr>
<td>Weight loss (&gt;10%)</td>
<td>6/13*</td>
<td>4/14</td>
</tr>
<tr>
<td>Any complication</td>
<td>7/14</td>
<td>5/12*</td>
</tr>
</tbody>
</table>
Gastrostomy tube placement in patients with oropharyngeal carcinoma treated with XRT or CRT: Factors affecting placement and dependence.
Bhayani, et al, Head and Neck 2012

- Retrospective analysis of 474 oropharyngeal cancer patients treated with XRT or CRT (2003-2008)
- PEG placement and dependence (> 6 mo) evaluated in relation
  - Site
  - T stage
  - Baseline swallow function
  - Weight
  - Smoking
  - Adherence to dysphagia exercises

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<table>
<thead>
<tr>
<th>Subsite</th>
<th>T Classification</th>
<th>PEG Placed</th>
<th>Timing of PEG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tongue base</td>
<td>T1, 93</td>
<td>Yes 293 (61%)</td>
<td>Before RT 13%</td>
</tr>
<tr>
<td>Tonsil</td>
<td>T2, 173</td>
<td>No 181 (38.2%)</td>
<td>During RT 80%</td>
</tr>
<tr>
<td>Soft Palate</td>
<td>T3, 118</td>
<td>After RT 7.2%</td>
<td></td>
</tr>
<tr>
<td>PPW</td>
<td>T4, 92</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

One patient required a break in treatment for PEG placement

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- Almost 40% of patients did not require G-Tube placement
- Factors that predispose to g-tube placement
  - T3 to T4 tumors
  - Concurrent chemotherapy
  - 3D conformal or concomitant boost doses
  - Current smoking status
  - Baseline swallowing dysfunction
  - Weight loss
- Adherence to an aggressive swallowing regimen may reduce long-term dependence on enteral nutrition and limit the rate of g-tube placement
Gastrostomy tube (g-tube) placement is significantly reduced in patients who report adherence to swallowing exercises.

Length of g-tube dependence is significantly decreased in patients who report adherence to swallowing exercise regimen.

Prophylactic PEG Placement

**Benefits**
- Nutritional support
- Improved Hydration
- Reduced weight loss
- Decrease treatment interruptions
- More comfortable than rescue NGT

**Risks**
- Long term dependence
- Complications
- Prolonged periods of NPO during treatment →
  - Muscle atrophy
  - Fibrosis
  - Stricture

Mikhail, 2001, Gillespie, 2006
To PEG or Not to PEG?

- Baseline dysphagia?
- Weight loss of more than 10% of body weight?
- Site of lesion?
- Compliance/motivation to participate in dysphagia therapy
- Comprehensive swallow evaluation prior to treatment can guide in that decision making.

Prophylactic Therapy Requires a Team

- Referral Sources
  - Otolaryngology
  - Radiation Oncology
  - Hematology Oncology
  - Oral Surgery
  - Nursing staff

- Team communication
  - Tumor board
  - Rounds
  - Support services
    - Nutrition services
    - PT/Lymphedema
    - Dentist

When counseling a new patient:

- Stress the importance of continued PO throughout treatment even if painful
- Must swallow everyday, even if PEG is placed
- Educate about the signs and symptoms of dysphagia and aspiration
- Establish a daily routine including oral hygiene and swallowing exercises
Emory - Oral Hygiene Protocol

• Rinse hourly with baking soda rinse
• Use magic mouthwash up to 4x/day - 10 minutes before meals if needed
• Drink water throughout day
• Use salivary substitutes as needed
• Avoid spicy and acidic foods
• Avoid caffeine and alcohol
• Eat a diet of soft, moist, bland foods
• Brush teeth after every meal
• Use fluoride trays as prescribed by dentist
• DO NOT SMOKE

Emory - Daily Swallowing Exercises
Prescribed During CRT

• Tongue Press
• Falsetto
• Effortful Swallow
• Tongue Hold
• Jaw ROM and Resistance
• Tongue Base Stretch
• Maintain PO throughout treatment

Tongue Press

• “Push entire tongue against palate and squeeze”
• Engagement of submental muscle group contributes to:
  • Hyoid elevation
  • Hyoid anterior motion
  • Laryngeal elevation and closure
  • Opening of UES
  • Tongue base strength, range and flexibility

Video 4
Falsetto (Effortful Pitch Glide)

• "Glide up in pitch and hold the high pitch"
• Contracts pharyngeal musculature
• Raises hyolaryngeal complex
• Contracts/retracts the tongue base

Effortful Swallow

• "Swallow as hard as you can"
• Increases tongue base retraction
• Increases hyoid elevation
• Increases pharyngeal pressure generation and UES opening duration

Tongue Hold

• "Put your tongue between your teeth and swallow in that position"
• Increases pharyngeal wall excursion May improve tongue base strength and flexibility
Range of Motion Exercises

- Jaw
  - Opening
  - Lateralization
  - Assisted if > 30 mm
- Tongue
  - Extension
  - Lateralization
  - Elevation
  - Retraction

Intervention During XRT

- Review information from initial consult
- Re-evaluate swallow function
- Practice prophylactic swallowing exercises
- Continue to reinforce the oral hygiene
- Implement use of saliva substitutes, topical anesthetics, and oral hydration products as needed
- Implement instrumental swallow assessment as indicated
- Implement therapeutic strategies as indicated
- Alert MD of any issues

Intervention After Completion of CRT

- Re-evaluate swallow function post treatment
- Maintain swallow safety
- If esophageal dysphagia evident, refer for medical intervention
- Establish Maintenance program
- Advance diet as tolerated
- Assist in weaning from tube feeds
- Promote swallow related QOL
- Recognize signs of dysphagia
- Implement maintenance program for long term
Late Radiation Associated Dysphagia

- Muscle Fibrosis
- Cranial Neuropathy
- Dysarthria
- Dysphonia/VPI
- Trismus
- ORN
- Strictures/stenosis
- Aspiration/Pneumonia
- Typically not responsive to therapy
- May progress over time
- Implement compensatory strategies
- Diet Modifications

Proactive Approach to Dysphagia

- Can guide team decision regarding placement of PEG tube.
- Can help prevent long term PEG tube dependence.
- Assists in minimizing complications during treatment.
- Empower patient to be proactive and give focus during treatment.
- Promote improved swallowing outcomes and swallow related QOL.
- Allows SLP to be involved in treatment planning from the beginning.
- Promotes team communication and support.

Thank you!
References:


Carroll, WR, Locher, JL, Canon, CL, Bohannon, IA, McColloch, NL, Magnuson, JS. Pretreatment swallowing exercises improve swallow function after chemoradiation. Laryngoscope 118: pp. 39–43


