Evaluation, Treatment, and Functional Outcomes in Patients with Head and Neck Cancer

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Head & Neck Cancer Treatment: What do we know?

- Traditionally, based on survival
- Contemporary treatment shift: ablative surgery → organ preservation
- Complicated and evolving, changing emphasis → QOL, Functional Outcomes, Cost ($)
- Swallowing outcomes have usurped speech as a primary focus of contemporary studies
- Higher mortality from causes other than disease progression
- Early stage → single modality treatment
- Advanced stage (=60%) → multidisciplinary/multi-modality
  - Combined ChemoXRT → improved locoregional control and organ preservation
  - Acute/chronic toxicity is common → FUNCTION (swallowing)
- Recurrent/metastatic disease
  - Remains a challenge...no good, well-tolerated treatment
  - Prognosis is dismal...overall survival 10 months
Complication Risks

Goals

**Treatment**
1. Eradicate the cancer while minimizing morbidity
2. Preserve/restore function
3. Maintain/improve quality of life

**Patient**
1. **Cure**
2. **Swallow** all foods/liquids
3. **Speak** with natural laryngeal voice
4. **Look** the same
1. Definitive (surg or XRT) vs. combinations (surg ± XRT ± chemo)
2. Remaining amount of the functioning organ
3. Clinician expertise and familiarity
4. Patient compliance with treatment and access to rehabilitative services (clinician and options)

Not all outcomes are the same…

Radiation Toxicity
Not just xerostomia and mucositis

- Voice
  - Dysphonia (>90% pts)
  - Severe dysphonia (~25%)
- Swallowing
  - Long-term prevalence (39%-64%)
  - Aspiration in unselected samples (36%),
    with c/o dysphagia (55 - 82%)
  - Silent aspiration (36 – 80% of aspirators)
  - Stricture (~7 - 10%)
  - G-tube placement (70 - 80%); long-term G-tube (5-15%)
“Conventional” XRT

Photons

- Photons (“x-ray”)
- Goal: Tumor control with less toxicity but….
- High entrance with a gradual exit…more damaging effects?

20 Gy
60 Gy
40 Gy
70 Gy

Proton Beam XRT

- Low “entrance”
- No “exit”
- Dose concentration in tumor target
- Minimized normal tissue damage dose…less damage?

NPC fields: LEFT: IMRT (photon); RIGHT: IMPT (proton)
MDACC Phase II Study for Young Patients with Intermediate or Locally Advanced SCC of Oral Tongue and FOM (N=23)

**MBS+ PROs (+ Pain)**

**Induct. Chemotx x 3 → glossectomy and ND**
(Paclitaxel, Ifosfamide, Mesna, cbdca)

**Margin + or > 1 node or + extracap extens. → RT**

**Margin - and node - or 1N + and no extracap extens. → Observe**

*Kies et al., 2001*
Swallowing Outcomes

**Perception**

Mean MDADI Scores

- **Physiology**

Mean OPSE Scores

**Diet Type**

- Full Diet (No restrictions)
- Full Diet (Liquid Restriction)
- Dry Bread and Crackers
- Soft Chewable Foods
- Non-oral Feeding

**Diet Levels (PSSHN)**

- Number of Patients

- **Post** vs **Baseline**

**Physiology doesn’t change but…tumor response reduces pain and affects patient perception… diet levels improve and patients report less difficulty.**

Effect of induction chemotherapy on speech and swallowing function in patients with oral tongue cancer.


**Late RAD**

- N=29 dysphagic (≥ 5 yrs) HNC pats
- 38% XRT; 62% CRT
- Median dose of XRT: 72 Gy (range: 66-70 Gy),
- Median # of fractions: 44 (range: 30-64)
  - Aspiration in all cases (physiologic)
  - 24% stricture
  - 86% pneumonia, 62% recurrent (50% → hospitalization)
  - 69% helped w/ swallow tx but NO durable improvement… REFRACTORY to simple, non-surgical therapies
  - 66% ultimately G-tube dependent, 21% TL b/c of aspiration
- Not only CRT and accelerated fractionation also XRT and IMRT
Outcomes: Eat and Exercise

*Proactive Swallowing Therapy*

- Swallowing therapy (eat and exercise) is feasible during (chemo)RT
- Both eat and exercise = independent effects
  - Full PO during XRT = 2.3 X more likely to eat regular diet long-term vs. NPO
  - Swallow exercise adherence = 3.6 X odds of eating regular diet long-term
- Eat and Exercise →
  - Shorter PEG duration & dependence long-term by 50%
  - 92% (vs. 65% neither) return to regular diet
- **SWALLOWING TX → Counteracts “loss” of resistive load when acute effects of RT/CRT cause patients to stop eating (solid foods)**


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A Protocol for Radiation Swallowing Intervention

JOURNAL OF CLINICAL ONCOLOGY

Prevention and Treatment of Dysphagia and Aspiration After Chemoradiation for Head and Neck Cancer

David J. Rosenfeld, Jon S. Levin, and Avraham Enbach
G-tubes
MDACC: Risk Factors for Placement and Dependence

- OP: n=474; HP: n=43
- G-tube (ever had)
  - OP: Yes - 62% (293/474), Never - 38% (181/293);
  - HP: Yes - 70% (30/43), Never - 30% (13/43)
- 1 year: OP: 9% (41/293); HP: 28% (11/30)
- Placement of g-tubes and duration (≥6 mos.)
  - OP: T3 to 4 tumors (p < .001), baseline self-reported dysphagia (p < .001), odynophagia (p < .001), >10% baseline weight loss (p < .001), and concurrent chemoradiotherapy.
  - HP: posterior hypopharyngeal wall primary tumors (p = .026), current smokers (p = .001), and patients with >40 pack years (p = .010)

1. Significantly lower rates of placement and shorter duration → oral intake at the end of treatment (p = .05), and adherence to dysphagia exercise regimens (p = .048)
2. Reactive feeding tube placement is feasible without a break in cancer treatment.

Surgery
Pre-treatment Speech Pathology Referral is Non-negotiable!
Up front multi-disciplinary participation!

Baseline Examination of Function 
Essential!

- Both, patient reported outcomes (PROs) of QOL/performance status and instrumental evaluation (MBS and/or FEES, laryngeal videostroboscopy)
- Documents pretx function and tx tolerance
- Key predictor/risk factor for long-term swallowing dysfunction
- Determines aspiration/airway protection
- Evaluates treatment alternatives for pats w/ comparable survival
- Ensures therapeutic G-tubes
- Provides realistic post-tx functional expectations for patient counseling
- Cannot assess outcomes or draw conclusions without it!
PEG Tube Dependence… A Measure of Swallowing Success?
Be careful of what you assume!

- Patient often unreliable…perception ≠ actual ability ≠ instrumental findings
- PROs (QOL/Sympt. Perform. Scales) = pat report NOT physiology
- Swallowing observation ≠ physiology ≠ etiology ≠ tx planning
- Chronic FT dependence ≠ measurement of dysphagia
  - Eat despite contraindication
  - Stop eating despite adequacy of swallow
Head and Neck Lymphedema

Chronic swelling in the head and neck region after trauma (surgery, XRT, infection) to the lymphatic system that blocks normal drainage pathways.

Total Laryngectomy

Total resection is sometimes better than organ-sparing reconstructions that tether or obstruct physiology and functionally cripple the larynx.
1. H&N cancer results in unique dysfunction distinct from other populations → requires expertise and familiarity to provide the right treatment for the right H&N cancer

2. Some change in H&N cancer survival → contemporary focus on QOL and functional preservation (surgical and non-surgical) that will likely be key determinants in future decisions regarding treatment of HNC

3. Future research must:
   a. Identify both AT RISK and TREATMENT-RESPONSIVE patients, exploring the role of new prognostic markers and patient/tumor characteristics.
   b. Investigate and finalize less toxic but still effective treatments.

4. The problem → Expertise and excellence are fading.

5. New surgical and rehabilitative techniques must improve over existing ones while reducing patient AND clinician burden.
Thank you!