Introduction to Speech and Swallowing Dysfunction in Patients with Head and Neck Cancer

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1. Medical Chart Review & Patient Interview

Get a thorough case history.
Listen to the patient!

- Performance status
  - Self-care/ADL independence
  - Mobility
- Mental/cognitive status
- Nutritional status (marker of baseline dysphagia??)
  - Weight loss/malnutrition
  - Tube dependent (if so, why? dysphagia, pain, prophylaxis, etc.?)
  - Diet level (restrictions?)
- Tracheostomy
- Functional status

- Pain level
  - Tolerance → predict tolerance for cancer treatment & motivation for rehabilitation
  - If present, treat it
- Comorbid diseases (relevant)
  - Scleroderma
  - Progressive neurological disease
  - CVA/TBI
  - Diabetes
2. Knowledge of H&N Cancer Tx Plan

Preparation

- Tumor
  - Stage
  - Site of disease
  - Involved structures
  - Pathology/prognosis
- Time-frames
  - How long will XRT last?
  - Duration of hospitalization
  - Start of PO
  - Trach tube? G-tube? Temp vs. permanent
- Treatment
  - Induction v. concurrent
  - IMRT vs. 3d
  - Conformal/Conventional
  - Open transcervical vs. transoral
  - Primary closure vs. reconstruction
  - Types of flaps and PO:
    - No → POD 1-1 wk
    - W/o XRT → 2-3 wks
    - W/ XRT → 4-6 wks
  - Know tx: targets/extent of radiation, resection, etc. and effect on function

3. Clinical Swallowing Evaluation

- Precedes instrumental evaluation (need MBS/FEES and PO readiness)
- Screens out patients with “functional” swallow
- Expensive, resource burden, and impractical to refer all patients for baseline instrumental → ≈ 1/3 pats need instrumental
- Oral-motor/motor speech exams (*handout*)
- Hypothesis of swallowing dysfunction
  - (oral vs pharyngeal disorder?)
- **CANNOT** rule out silent aspiration!
4. Instrumental Swallow Evaluation

- Not always indicated
- Indications for pretreatment *instrumental* swallow study
  - Signs/symptoms of aspiration on clinical swallow evaluation
  - Candidacy for conservation surgery (tx decisions and long-term outcomes)
  - Considering tx alternatives in pats. w/comparable survival rates (e.g., surgery vs ChemoXRT)
  - Poor pulmonary status or comorbid neuro diagnosis (eg, Parkinson’s), CN palsy
  - Salvage treatment after radiation (pre-existing dysphagia)
- Gold-standard *baseline* remains the MBS

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**MDACC Pathway for Rehabilitation (TORS)**

- **Baseline**
  - MBS
  - Video-documentation/strobe
- **Acute**
  - Feeding tube: •Salvage TORS •T4 •>30-50% BOT/PW •SGU/HP extension •Pre-TORS dysphagia •Flap
  - Inpt consult (all TORS): Clin Swallow Exam POD #1-2
- **Outpatient**
  - Dysphagia management: •Strategies pm •Exercises (lingual, pharyngeal, jaw) •Repeat MBS pm (per SLP) •Strobe/video-documentation pm
  - PORT: •Preventive exercise regimen POH• Standard RT F/U schedule
Management of Trismus: Therabite Exercise Protocol

- **Indication for Therabite**
  - >1 cm decrease in oral opening from baseline, start within 3 weeks of RT
  - Start before RT if >50 Gy to pterygoid m. (e.g., nasopharynx, BOT tumors)
  - Physician clearance
- **Therabite exercise regimen**
  - 3 cycles, 3x / day (~2 months)
  - 1 cycle: 5 repetitions = 30 s. open, 30 s. closed
  - Increase aperture at 1 week
  - *Endpoint is discomfort, not pain (pain meds., heat, etc.)*

Oral Motor & Motor Speech Exam

- **Oral Motor Examination**
  - Tumor extent & effect on physiology
  - CN exam
  - Symmetry and ROM
  - Dentition
- **Motor Speech Evaluation:**
  - Diadochokinetics (alternating & sequential)
  - Dysarthria?
    - Structural due to tumor/surgery
    - Flaccid due to cranial neuropathies
  - Dysphonia (marker of TVF functioning)
  - Resonance (velopharyngeal competency)
- Also key component of *posttreatment* assessment
Three Phases of Treatment

- Phase I - before XRT
- Phase II - during XRT
- Phase III - after XRT

Phase I - Before Radiotherapy

- **Baseline swallow evaluation**
  - Clinical...yes. Instrumental?
- **Patient education**
  - What’s normal?
  - Expected changes
  - Review short and long term XRT sequelae
- **Set goals**
  - Swallow, swallow, swallow
  - Provide preventative swallowing exercise program
We give these resources:

- *A Team Approach to Treating Head and Neck Cancer*
  
  www.cancercare.org

- *Head and Neck Radiation Treatment and Your Mouth*
  
  www.nidcr.nih.gov

- *Dinner Through a Straw*
  
  www.dinnerthroughastraw.net

MDACC Preventive Swallowing Exercise Protocol

- **Objectives**
  - Prevent or reduce fibrosis
  - Maintain ROM of the oropharynx and larynx
  - 4x/day (consensus) before, during, & 6M after treatment

- **Exercises**
  - Suprathyoid strap musculature
    - Shaker
    - Mendelsohn
  - Larynx
    - Supraglottic swallow
    - Pitch glides
  - Base of tongue
    - Masako
    - Effortful swallow
  - Mandible
    - Mandibular stretch
    - 3 finger test
Phase II – During Treatment
SLP Services

- **Goal**
  - Safest PO
  - Keep SWALLOWING something
  - Adherence to exercise
- **Frequency of diagnostic visits**
  - Every 3 weeks (minimal physiol. changes and experiencing acute toxicity)
  - Clinical swallow evaluation each visit
- **Frequency of treatment**
  - Every 3 wks or more as needed for instruction and training re: exercise and swallowing strategies

Phase II – During XRT
Patient Symptoms (Weeks 1-2)

- Should be mild
- May include any of the following
  - Edema (20 Gy)
  - Dermatitis and mucositis (20-40 Gy)
  - Mild changes in taste/dysguesia
  - Xerostomia/Thick saliva
  - Odynophagia
  - Erythema
  - Fatigue
Phase II – During XRT
Intervention (Weeks 1-2)

- Ensure independence with exercise
- Diet modifications as needed (rare this early unless advanced stage with baseline dysfunction)
- Monitor oral intake
- Use flat ginger ale, carbonated H2O, mucolytic to thin secretions
- Vocal hygiene as needed
- KEEP SWALLOWING!

Phase II – During XRT
Patient Symptoms (Weeks 3-4)

- High variability
- Mucositis worsens
- Pain and edema ↑, appetite ↓
- Oral intake decreases
- Swallowing may deteriorate
- Stiffness and sensory loss
- Potential dysphonia
- Depression
Phase II – During XRT

Intervention (Weeks 3-4)

- Repeat clinical swallow evaluation
- Recommend diet modifications (KEEP SWALLOWING!!!)
  - Often downgrade to soft solids or pureed consistencies – avoid spice
  - Liquid supplements
  - Collaborate with dietitian re: intake goals
  - Swallowing strategies as needed
- Pain control essential to maintaining PO intake
- Establish a swallowing schedule, e.g., 30 mins following pain medication
- Encourage exercise – reduce frequency
- Videofluoroscopy limited use → poor tolerance barium (mucositis)

Phase II – During XRT

Patient Symptoms (Weeks 5-7)

- Severe mucositis and pain
- Severe odynophagia
  - NPO (avoid complete NPO!)
  - Often liquid only diet
- Possible s/s aspiration
- Foreign body sensation (mucus, reflux)
- Dysgeusia
- Dysphonia, maybe aphonia
Phase II – During XRT Intervention (Weeks 5-7)

- Repeat clinical swallow evaluation
  - Often liquids only → rule out s/s aspiration
  - Swallowing strategies as needed
- Keep SWALLOWING → Reinforce swallowing regardless of the type/texture/amount
  - Saliva
  - Water
  - Nutritional supplements
- Pain management service
- Education regarding recovery
  - XRT - cumulative effect
  - Weeks 7-9 will be worse
  - Gets worse before better
- Plan of care during recovery (provide goals for return visit)
  - Discuss “NEW NORMAL”
  - Diet advancement – food choices, try and try again
  - XRT exercises as tolerated

Phase III: After Radiation

- Swallowing treatment differs depending on the time post-XRT (preventive vs rehabilitative vs compensatory)
- Acute post-XRT phase
  - Often restorative/rehabilitative focus
  - Facilitate advancing oral intake
  - Focus on changing and improving acute post-XRT sequelae
- Chronic post-XRT phase
  - Often compensatory focus
  - Managing chronic or progressive fibrosis/neuropathy
  - Counseling and monitoring
  - Trial exercises
Phase III - After XRT

Patient Symptoms

Acute Post-XRT Phase (first 6 months after XRT)
- Short-term sequelae should improve substantially in first 1-2 months, but often persist up to 3-6 months:
  - Dysguesia
  - Odynophagia
  - Mucositis
- Weaning from tube feedings
- Voice improving
- Xerostomia more apparent as thick mucus resolves
- Some develop food aversions – especially if NPO for a long period of time
- Fibrosis begins???

Phase III – After XRT

Intervention

- Acute Post-XRT Phase
- Post-XRT management begins with a 4-6 wk post-XRT follow-up appt:
  - Repeat clinical swallow evaluation
  - Videofluoroscopy if abnormal clinical evaluation at 4-6 weeks
- Important to aggressively advance p.o. intake during this period:
  - Use it or lose it
  - Avoid developing food aversion
- Exercise → continue for 6 months → re-evaluate
  - Reinforce/re-train swallowing exercise protocol
  - Re-educate re: effects of fibrosis
- Repeat swallow evaluation once acute symptoms have resolved (clinical or MBS as indicated)
Phase III – After XRT

**Intervention**

- Chronic Post-XRT Phase
- Instrumental assessment is key
- Possible stricture
  - Spitting in cup (may be diagnostically valid or may be aversion to thick secretions), unable to advance to soft solids
  - Don’t expect complete resolution of dysphagia following dilation
- Expect aspiration - has patient been tolerating aspiration? Accomodation?
- NPO status will only worsen long-term outcomes
- Attempt to find safest consistencies
- Aggressive dysphagia rehabilitation is critical
- Training of compensatory swallowing strategies
PREVENTATIVE
RADIATION SWALLOWING EXERCISE PROTOCOL

Radiation to the head and neck can lead to long-term swallowing problems (dysphagia). Dysphagia can occur during treatment, or develop or persist long after radiation treatment has ended. These exercises have been developed to reduce the potential for long-term swallowing problems and/or improve swallowing function.

Perform this sheet of exercises 4 times each day
Exercises should take approximately 10-15 minutes to complete.

Strap Muscle Exercises: The strap muscles move your voice box up and out of the way to prevent food and liquid from entering the lungs (aspiration). These exercises are designed to increase flexibility and strength of the strap muscles.

1. Shaker exercise (part 1)
   - Lie down on your back with your shoulders and head on a flat surface.
   - Keeping your shoulders stable, lift your head up bringing your chin down to your chest (until you can see your toes)
   - Keep your head lifted for 30 seconds, and then lower your head and rest for 30 seconds
   - Repeat 3 times

2. Shaker exercise (part 2)
   - Lie down on your back with your shoulders and head on a flat surface.
   - Keeping your shoulders stable, lift your head up bringing your chin down to your chest, then lower your head
   - Repeat 15 times

3. Mendelsohn
   - Put your fingers over your Adam’s apple and swallow. Feel the upward movement of your Adam’s apple while you swallow.
   - Now, swallow and hold the Adam’s apple at its highest point for 3 seconds during the swallow.
   - Repeat 5 times

4. Stretch
   - Tilt your head back, open your mouth
   - Protrude your jaw forward, now pull your jaw upward toward your nose
   - Hold for 5 seconds
   - Repeat 5 times

Airway Protection Exercises: During swallowing it is important that the voice box close tight to keep food or liquid from entering the lungs (aspiration). These exercises are designed to improve closure of the voice box improving your swallow and may also help to improve the flexibility of your voice.

5. Supraglottic swallow
   - Hold your breath and bear down. Now, swallow twice (dry swallows), cough, and swallow again (dry swallow)
   - Repeat 5 times

6. Pitch glides:
   - Sing “ee” starting at your lowest note and then gradually slide up to your highest pitch. Hold pitch for 10-20 seconds.
   - Repeat 5 times

Base of Tongue Exercises: The base of tongue is the “pump” which pushes food through the throat and toward your food pipe. These exercises are designed to strengthen the base of tongue.

7. Masako exercise
   - Stick out your tongue & hold it between your lips or teeth. Now, try to swallow.
   - Repeat 5 times

8. Effortful swallow
   - Swallow as hard as you can with food and/or saliva. Push as hard as you can with the tongue against the roof of your mouth while you swallow
   - Repeat 5 times

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References


5. Huckabee ML, Steele CM. An analysis of lingual contribution to submental surface electromyographic measures and pharyngeal pressure during effortful swallow. *Archives of physical medicine and rehabilitation* 2006;87:1067-1072.

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**Strap Muscle Exercises:** The strap muscles move your voice box up and out of the way to prevent food and liquid from entering the lungs (aspiration). These exercises are designed to increase flexibility and strength of the strap muscles.

**Perform 3 sets of the Shaker Exercise each day for 6-8 weeks**

9. **Shaker exercise (part 1)**
   - Lie down on your back with your shoulders and head on a flat surface.
   - Keeping your shoulders stable, lift your head up bringing your chin down to your chest (until you can see your toes)
   - Keep your head lifted for 60 seconds, then lower your head and rest for 60 seconds
   - Repeat 3 times

   **Shaker exercise (part 2)**
   - Lie down on your back with your shoulders and head on a flat surface.
   - Keeping your shoulders stable, lift your head up bringing your chin down to your chest, then lower your head
   - Repeat 30 times

**Perform 5-10 sets of the remaining exercises each day for ______ months**

10. **Mendelsohn**
    - Put your fingers over your Adam’s apple and swallow. Feel the upward movement of your Adam’s apple while you swallow
    - Now, swallow and hold the Adam’s apple at its highest point for 3 seconds during the swallow
    - Repeat 5 times

11. **Stretch**
    - Tilt your head back and open your mouth.
    - Protrude your jaw forward and pull your jaw upward toward your nose. Hold for 5 seconds.
    - Repeat 5 times

**Airway Protection Exercises:** During swallowing it is important that the voice box close tight to keep food or liquid from entering the lungs (aspiration). These exercises are designed to improve closure of the voice box.

12. **Supraglottic swallow**
    - Hold your breath and bear down. Now, swallow twice (dry swallows), cough, and swallow again (dry swallow)
    - Repeat 5 times

13. **Pitch glides:**
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    - Repeat 5 times

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14. **Masako exercise**
    - Stick out your tongue & hold it between your lips or teeth. Now, try to swallow
    - Repeat 5 times

15. **Effortful swallow**
    - Swallow as hard as you can with food and/or saliva. Push as hard as you can with the tongue against the roof of your mouth while you swallow
    - Repeat 5 times

16. **Gargle**
    - Pull your tongue back during a gargle and hold for 1 second.
    - Repeat 5 times

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