Submandibular gland transfer

Disclosures

• None
Xerostomia

- ~90% of HNSCC patients receive radiotherapy
- Most common serious and long-term adverse affect following radiotherapy
  - QOL impacts: taste, chewing, swallowing, dry mouth, speech, sleep
  - Heightened susceptibility to dental disease, ORN
- ~60% decrease in saliva production 2 weeks after 23Gy
- PERMANENT and UNRESERVABLE after 39 Gy (“SMG sparing dose”)
  - Incidence of mod/severe xerostomia 30-38% after one year, 22-36% after two years even with IMRT advances

SMG contribution

- 1.5-2L saliva production per day
- Mucinous saliva produced by the SMGs contribute more to unstimulated/resting flow rate and QOL than the stimulated serous saliva of the parotid
- SMG resection patients compared to controls
  - No difference in stimulated salivary flow
  - Unstimulated salivary flow: 0.6ml/min vs 0.94ml/min (1/2 liter less per day!)
Gland transfer = gland protection

Learning objectives

• Why perform submandibular gland transfer?
• Is the procedure surgically feasible? Does it reduce the radiation dose received by the gland?
• What patients would benefit from a submandibular gland transfer?
• What are the objective and patient subjective outcomes after the procedure?
• What are the potential pitfalls?
Seikaly et al., 2001

Surgically feasible

- 25 patients
- ~45 minute procedure
- No major complications
  - Facial edema
- No disease recurrence on side of transfer
Phase II study: SMG transfer prior to radiation (RTOG 0244)

- 44 patients
- Photography review by two reviewers
- Reproducible procedure (i.e. “per protocol”) in 77% of patients in a multicenter setting
- 74% were prevented from radiation-induced acute xerostomia


The UCSF modified submandibular gland transfer
Objective gland movement...

<table>
<thead>
<tr>
<th>Table 3: SMG location*</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Anteroposterior length difference</td>
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<td>Anteroinferior margin difference</td>
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<td>Posterior margin difference</td>
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<td>Superior margin difference</td>
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...and preserved salivary flow

<table>
<thead>
<tr>
<th>TABLE II. Salivary Flow Rates in MILLiters per Minute</th>
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<td>Patient No.</td>
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</table>

N/A = not available.
Preserved gland function

Radiation dose reduction

- Ipsilateral gland dosage ~50-70 Gy
- Transferred gland dosage ~26-30 Gy
  - IMRT alone goal is <39 Gy (~60% success rate)
Which patients will benefit?

cT3N1M0 (AJCC 8th edition)
Stage 2 HPV mediated right base of tongue SCC

Transfer indication(s)?
Indication #1

- Base of tongue cancer, bilateral radiation
- Higher likelihood of contralateral nodal metastasis in BOT SCC
- Contralateral SMG can be spared if no clinical neck disease

cT2N2a (AJCC 7th edition)
Stage 4 p16+ right tonsil SCC

Transfer indication(s)?
Indication #2

- Large tonsil tumor with >1cm extension onto soft palate or base of tongue, bilateral neck radiation
- Small tumors confined to tonsil have low risk of contralateral spread
- Higher likelihood of contralateral nodal metastasis with soft palate and BOT extension

cT2N1 (AJCC 8th edition) Stage 1 HPV-mediated left tonsil SCC

Transfer indication(s)?
Indication #3 – controversial

- Unilateral tonsil cancer, bilateral radiation recommended

- Clinical (*or radiographic*) evidence of extranodal extension (ENE) and/or bulky neck disease → increased risk of contralateral nodal metastasis

SMG transfer efficacy

- Saliva production preservation*
- Patient acceptance and relief from symptoms
Jha et al, 2003 – prospective clinical trial

• 76 patients who underwent SMG transfer followed by radiation
• No other sialogogues/salivary gland protectants

• Salivary flow studies*
• University of Washington Quality of Life Questionnaire

Salivary flow following radiation

• Stimulated and unstimulated salivary flow rates: preop, 2 weeks post op, and 2, 6, 10, 16, and 24 weeks following radiation
• Transferred gland retains ~70% of baseline salivary outcome (23% for non transferred gland)

* flow evaluations do not correlate with patient symptom of xerostomia
Patient reported outcomes

- University of Washington QOL questionnaire
- 10-20 = minimal/no xerostomia

<table>
<thead>
<tr>
<th>Period</th>
<th>N</th>
<th>Percent 10–20</th>
<th>95% CI</th>
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<tbody>
<tr>
<td>Pre XRT</td>
<td>43</td>
<td>97.7</td>
<td>(93.2, 100.0)</td>
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<tr>
<td>Post XRT</td>
<td>37</td>
<td>81.0</td>
<td>(68.7, 93.5)</td>
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<td>2 months follow up</td>
<td>34</td>
<td>64.7</td>
<td>(48.6, 80.8)</td>
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<tr>
<td>6 months follow up</td>
<td>28</td>
<td>71.4</td>
<td>(54.7, 88.1)</td>
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- Patients with 2+ years f/u: 83% in the SMG transfer group reported normal amount of saliva compared to none in the non-SMG transfer group

SMG transfer vs pilocarpine

- Surgery is the treatment of choice
- Swallowing, social eating, sticky saliva, dry mouth, coughing
- 0.05ml/min vs 0.01ml/min
- Phase III RCT closed at 6 month interim analysis

Potential pitfalls

• Another procedure – think about patient candidacy early
• Wrong patient selection – unnecessary surgery
• Infection, complication → radiation delay
• Patient confusion, counseling
• Post treatment surveillance
Even if it isn’t perfect...

• 5-10% dose reduction per millimeter

My thoughts on SMG transfer

• Surgically feasible, small learning curve
• Think early about the patients who will benefit
• Reproducible objective results, but more importantly...
• *Improved QOL for your patients*
• Techniques, tips, and tricks tomorrow at the **Oto Film Fest**!
Thank you!
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