OBJECTIVES

- To review the current Staging System
- To define the different Neck Dissections.
- To describe the current management of the cervical lymph nodes in SCCa of the H&N in a “stage based paradigm”.

“N” STAGE

Prognostic Significance

5 Year Disease Free Survival

Modified from KOWALSKI et al, Head & Neck 22:307, 2000
"N" Staging: Regional Lymph Nodes

**Oral Cavity, Oropharynx, Hypopharynx and Larynx**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>No regional lymph node metastasis</td>
</tr>
<tr>
<td>N1</td>
<td>Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension</td>
</tr>
<tr>
<td>N1a</td>
<td>Metastasis in a single ipsilateral lymph node, 3 cm but not more than 6 cm in greatest dimension</td>
</tr>
<tr>
<td>N2a</td>
<td>Metastasis in multiple ipsilateral lymph nodes, none more than 3 cm in greatest dimension</td>
</tr>
<tr>
<td>N2b</td>
<td>Metastasis in multiple ipsilateral lymph nodes, some more than 3 cm in greatest dimension</td>
</tr>
<tr>
<td>N2c</td>
<td>Metastasis in bilateral or contralateral lymph nodes, none more than 3 cm in greatest dimension</td>
</tr>
<tr>
<td>N3</td>
<td>Metastasis in a lymph node more than 6 cm in greatest dimension</td>
</tr>
</tbody>
</table>

**Nasopharynx**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0</td>
<td>No regional lymph node metastasis</td>
</tr>
<tr>
<td>N1</td>
<td>Bilateral metastasis in lymph node(s), 6 cm or less in greatest dimension, above the infraclavicular fossa*</td>
</tr>
<tr>
<td>N2</td>
<td>Bilateral metastasis in lymph node(s), 6 cm or less in greatest dimension, below the infraclavicular fossa*</td>
</tr>
<tr>
<td>N3a</td>
<td>Greater than 6 cm in dimension</td>
</tr>
<tr>
<td>N3b</td>
<td>Extension to the infracavicular fossa</td>
</tr>
</tbody>
</table>

**NECK DISSECTION**

**CLASSIFICATION CRITERIA:**
- The lymph node regions (levels) removed
- The structures preserved (XI Nerve, IJV, SCMM)

**NECK DISSECTIONS: CLASSIFICATION**

<table>
<thead>
<tr>
<th>Lymph Node Groups</th>
<th>Structures Preserved</th>
</tr>
</thead>
<tbody>
<tr>
<td>RADICAL</td>
<td>I - V</td>
</tr>
</tbody>
</table>
### Neck Dissections: Classification

<table>
<thead>
<tr>
<th>Lymph Node Groups</th>
<th>Structures Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELECTIVE I – III/IV</td>
<td>&quot;Supraomohyoid&quot;</td>
</tr>
<tr>
<td>II – IV &quot;Lateral&quot;</td>
<td>---</td>
</tr>
</tbody>
</table>

**Diagrams:**
- **Left Diagram:** Illustrates the removal of structures for SELECTIVE I – III/IV and II – IV "Lateral".
- **Right Diagram:** Shows the removal of structures for SELECTIVE I – III/IV, II – IV "Lateral", suboccipital, retroauricular, and posterolateral regions.
NECK DISSECTIONS: CLASSIFICATION

- RADICAL
  - MODIFIED RADICAL
    - With Preservation of XI Nerve
    - With Preservation of XI Nerve, IJV, SC/MM
- SELECTIVE
  - I – III (Supraomohyoid)
  - II – IV (Lateral)
  - Posterolateral
- EXTENDED

OBJECTIVES

- To review the current Staging System
- To define the different Neck Dissections.
- To describe the current management of the cervical lymph nodes in SCCa of the H&N in a “stage based paradigm”.

Stage Based Treatment of the Neck

- Treatment modality: SURGERY
  - Oral Cavity
  - T1-2 Supraglottic larynx
  - T 1-2 Oropharynx (Transoral resection)
Clinical N0 Neck:

**Stage Based Treatment of the Neck**

- Treatment modality: **SURGERY**

Site of Primary Tumor | Percentage of Necks With Node Metastases
--- | ---
**ORAL CAVITY** |  
Oral Tongue | T1 14, T2 30, T3 47.5, T4 76.5
Floor of the Mouth | T1 29, T2 43.5, T3 53.5
Retromolar Trigone | T1 37.5, T2 54, T3 67.5

CT, MRI, PET scans do not detect 40 - 50% subclinical metastases

- DiNardo 98
- Don et al 95

**N0 Neck: Concern for Subclinical Metastases?**

Site of Primary Tumor | Percentage of Necks With Node Metastases
--- | ---
**LARYNX** |  
Glottic | T1 11, T2 22
Supraglottic | T1 39, T2 69.5, T3 64.5, T4 59
**HYOPHARYNX** | T1 63, T2 69.5, T3 79, T4 73.5

DiNardo 98

Node Size < 10 mm (% Oral Cavity) 88%

(All sites) 67%
SCCa of Oral Cavity
Tumor Thickness: Predictive Value for LN Metastases
A Meta-analysis of Reported Studies

<table>
<thead>
<tr>
<th>Tumor Thickness Cutoff Point</th>
<th>No of Studies</th>
<th>Negative Predictive Value</th>
<th>False Predicted Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 mm</td>
<td>4</td>
<td>94.7</td>
<td>5.3</td>
</tr>
<tr>
<td>4 mm</td>
<td>9</td>
<td>95.5</td>
<td>4.5</td>
</tr>
<tr>
<td>5 mm</td>
<td>6</td>
<td>83.4</td>
<td>16.6</td>
</tr>
<tr>
<td>6 mm</td>
<td>4</td>
<td>87.0</td>
<td>13.0</td>
</tr>
</tbody>
</table>


N0 Neck: Concern for Subclinical Metastases?

Treatment of the Neck: Stage Based
Primary Treated with SURGERY

Clinical N0
Observation
SNB
Selective ND

Clinical N0
Observation
SNB
Selective ND
### N0 Neck

#### Elective Treatment vs. Observation

**“Modern” Prospective Randomized Studies**

<table>
<thead>
<tr>
<th>Study</th>
<th>5 Year DFS (%)</th>
<th>% N+ Observation</th>
<th>% Salvaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kligerman et al 1994</td>
<td>72</td>
<td>49</td>
<td>42</td>
</tr>
<tr>
<td>Yuen et al 2009</td>
<td>87</td>
<td>89</td>
<td>31</td>
</tr>
<tr>
<td>Cruz et al 2009</td>
<td>68</td>
<td>74</td>
<td>47</td>
</tr>
</tbody>
</table>

Currently... most H&N Surgeons prefer to dissect the neck electively (social/psychological make up of our patients)

In the future... increasing reliance on US for follow up may make surgeons more comfortable with observation.
SELECTIVE NECK DISSECTION
(SURGERY ALONE)

NECK PATHOLOGICALLY N\textsubscript{0}

<table>
<thead>
<tr>
<th>Study</th>
<th>Recurrence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Byers, 1986</td>
<td>6.9%</td>
</tr>
<tr>
<td>Spiro, et al, 1988</td>
<td>5.0%</td>
</tr>
<tr>
<td>Kowalski, et al, 1993</td>
<td>3.2%</td>
</tr>
<tr>
<td>Medina et al, 1995</td>
<td>3.45%</td>
</tr>
<tr>
<td>Ambrosch, 1996</td>
<td>4.1%</td>
</tr>
<tr>
<td>Pitman, et al, 1997</td>
<td>4.5%</td>
</tr>
<tr>
<td>Davidson, et al, 1997</td>
<td>7.0%</td>
</tr>
<tr>
<td>Pellitteri, et al, 1997</td>
<td>3.0%</td>
</tr>
</tbody>
</table>

PROSPECTIVE TRIAL
SUPRAOMOHYOID NECK DISSECTION vs TYPE III MRND
Brazilian Head & Neck Cancer Study Group

Overall Survival Rates According to Therapeutic Group

Currently, selective neck dissection is the preferred surgical treatment of the N\textsubscript{0} neck.
In the foreseeable future:
A selective neck dissection will not be the preferred way to detect occult metastases.
### Evolution of Treatment of the Neck: The N0 Neck

<table>
<thead>
<tr>
<th>Lymphoscintigraphy</th>
<th>Sentinel Node Excision</th>
<th>Serial Sectioning &amp; IHC</th>
</tr>
</thead>
</table>

#### Selective Neck Dissection
- Average: 24 nodes
- Serial Sectioning, IHC, molecular markers

#### Sentinel Node Biopsy
- Average: 2.4 nodes
- One histologic section

---

| Literature | 223 | 98% | 30% | 70% | 98% |
| Conference | 379 | 97% | 29% | 71% | 96% |

---

**2nd International Conference SNB in Mucosal Head and Neck Cancer: 2005**
SNB: Limitations

In the future:
The likelihood of occult metastases from tongue cancer will be determined based on a panel of molecular/gene markers in the primary tumor.

Clinical N+, SND, MRND, RND (Adequate removal of neck disease)

THE N+ NECK: Recent observations

Clinically N1 neck disease involving levels I or II

- Nodes pathologically negative (pN0): 54.7%
- Isolated Metastasis: Level IV or V: 0.0%

Selective Neck Dissection (N+ Neck)

- **N2a Level I**
- **Selective ND I - IV**

**Pathological Stage**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Recurrence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>4.9%</td>
</tr>
<tr>
<td>N2</td>
<td>12.1%</td>
</tr>
</tbody>
</table>


Prospective Trial: Brazilian Head and Neck Group

Overall Survival Rates According to Therapeutic Group

• Multiple, large nodes at different levels

Radical neck dissection

• Multiple, matted nodes.

Radical neck dissection

Multiple small nodes in different levels, including Level V

Modified radical neck dissection
Clinical N0

- SNB
- Selective ND

**pN0**
No further treatment

Clinical N+

- SNB
- Selective ND

RND, MRND, SND (Adequate removal of neck disease)

**pN1**
Postop. Radiation (?)

Treatment of the Neck: Stage Based
Primary Treated with SURGERY

**NECK DISSECTION**
Oral Tongue Cancer

**NECK PATHOLOGICALLY N1**
Medina, et al, 20%
Byers, et al, 25%
Ambrosch, et al, 16%

Regional Failure Supraomohyoid Neck Dissection

Path N1 + ECS
50
With XRT: 36
Without XRT: 14

2/36 (5.6%) Regional Failure 5/14 (35.7%)
Treatment of the Neck: Stage Based
Primary Treated with SURGERY

Clinical N0
  ↓
SNB
  ↓
Selective ND
  ↓
pN 2-3
Postop. Radiation
ECS: Chemo/Radiation

Clinical N+
  ↓
RND, MRND, SND
(Adequate removal of neck disease)

Evaluation of the Dose for Postoperative Radiation Therapy of H&N Cancer: Prospective Randomized Trial (MDACC)

Risk | Dose (Gy)
--- | ---
Lower | 57.6
Higher (ECS) | 63.0

Risk Analysis:

The Treatment of the N+ Neck
Postoperative Radiation vs Concurrent Radiation and Chemotherapy

459 Patients
334 Patients

Randomized

Radiotherapy
60 – 66Gy/ 6 – 6.5 weeks

Radiotherapy
Cisplatin 100mg/m²q (D 1, 22, 43 - 44)

Treatment Arm
Local Regional Control
RTOG
72%
69%

EORTC
82%
82%

p= 0.01
p= 0.007

Overall Survival
Patients with positive margin and/or ECE


Treatment of the Neck: Stage Based
Primary Treated with SURGERY

Clinical NO
No further treatment

SNB
Selective ND

pN0
Postop. Radiation (?)

RND, MRND, SND
(Adequate removal of neck disease)

pN1
Postop. Radiation
Chemo/Radiation

pN 2-3
Postop. Radiation
Chemo/Radiation

Stage Based Treatment of the Neck
- Treatment modality: RADIATION + CHEMO
  - Oropharynx
  - T3 larynx, hypopharynx

Treatment of the Neck: Stage Based
Primary Treated with RADIATION + CHEMOTHERAPY
Clinical N0

Treatment of the Neck: Stage Based
Primary Treated with RADIATION + CHEMOTHERAPY

Clinical N0

No further treatment

Radiation

Clinical N0

PET/CT 12 wks

NEGATIVE

Observation

Persistent Palpable or Radiological Abnormality

PET/CT 12 wks

NEGATIVE

Observation

Clinical N0

No further treatment

Radiation

Clinical N+

Complete Response

Persistent Palpable/Rad. Abnormality

Clinical N0

PET/CT 12 wks

NEGATIVE

Observation

Persistent Palpable or Radiological Abnormality
Utility of PET-CT Management N+ Neck: Organ Preservation

<table>
<thead>
<tr>
<th>PET</th>
<th>Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PPV</td>
</tr>
<tr>
<td>Positive (SUV &gt;3)</td>
<td>44%</td>
</tr>
</tbody>
</table>

Sterling R et al.. Presented AAOHN. October 2012

Persistent Palpable or Radiological Abnormality

PET/CT 12 wks

Exam q 4 wks
US/CT

POSITIVE

NEGATIVE

Neck Dissection

Observation

Extent of Disease
(RND, MRND, SND, SSND)

Pre-treatment: SUV 13.6
Post-treatment: SUV 3
Patients with clinical and radiologically positive nodes in Level II only could benefit from SSND?

Regional Control

**Overall Neck Recurrence Rate: 2/50 (4%)**

Recent trend….

<table>
<thead>
<tr>
<th>Selective Neck Dissection</th>
<th>Recurrence in the Neck</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>33</td>
<td>1 (3%)</td>
</tr>
</tbody>
</table>

Stenson K et al Arch Otolaryngol 120:650, 2000
OBJECTIVES

- Understand the current Staging System
- Know the different neck dissections.
- Working understanding of the role of staging on the current management of the cervical lymph nodes in SCCs of the H&N.

NECK DISSECTIONS: CLASSIFICATION

- RADICAL
- MODIFIED RADICAL
  - With Preservation of XI Nerve
  - With Preservation of XI Nerve, IJV, SCM
- SELECTIVE
  - I – II (Supraomohyoid)
  - II – IV (Lateral)
  - Posterior
eal
- EXTENDED