Management of Lymph Nodes in Patients with Thyroid Cancer:
What’s new in the 2009 Revised ATA Guidelines

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Naftziger Postgraduate Course, April 30, 2010

Thyroid Cancer Lymph Nodes: Pre-Test

- “ATA guidelines”
- “Bethesda System”
- “Node-Mapping”
- “Levels VI neck nodes dissection”
- “Therapeutic” or “prophylactic” node dissection
- “Ultrasound-guided blue-dye-injection” dissection

Thyroid Cancer: Increasing Incidence
Surveillance Epidemiology and End Results (SEER)

- 24,200 new cases of thyroid cancer in 2004
- 1,500 died of thyroid cancer in 2004
- 290,000 survivors of thyroid cancer in USA
- The incidence doubled from 1990
- 4% increase per year

Increasing Incidence of Differentiated Thyroid Cancer
1988-2005, SEER, percent change per year

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro ca (&lt;1.0 cm)</td>
<td>9.9%</td>
<td>8.6%</td>
</tr>
<tr>
<td>T3 (Tumors ≥ 4 cm)</td>
<td>3.7%</td>
<td>5.7%</td>
</tr>
<tr>
<td>M1 (Distant met)</td>
<td>3.7%</td>
<td>2.3%</td>
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Doubling time 10%=8 yr, 5%=14 yr, 3%=24 yr

ATA Guidelines

- Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer.
- 2006, revised 2009
- Evidence-based recommendations, used by endocrinologists and primary care physicians.

ATA Guideline 2009: Nodule

Recommendation # 5 (US-FNA)

- (a) FNA is the procedure of choice in the evaluation of thyroid nodules. Recommendation rating: A
- (b) US guidance for FNA is recommended for those nodules that are nonpalpable, predominantly cystic, or located posteriorly in the thyroid lobe. Recommendation rating: B.

Thyroid, 2009 Nov;19(11):1167-214

Thyroid 19:1167-1214, 2009

ULtrasound

US Guided FNA

Thyroid Ultrasonography
Thyroid Nodule Ultrasound

◆ Nodule high risk for cancer
  – Larger than 1 to 1.5 cm
  – Irregular, vascular, calcification
  – Round, instead of oval or flat
◆ Other aspects of thyroid ultrasound
  – Presence of other nodules
  – Presence of lymph nodes
  – Document size and appearance for follow up
  – Determine where to make the incision

ATA Guideline 2009: Recommendation #21 (“node-mapping”)

◆ Preoperative neck US for the contralateral lobe and cervical (central and especially lateral neck compartments) lymph nodes is recommended for all patients undergoing thyroidectomy for malignant cytologic findings on biopsy. **US guided FNA of sonographically suspicious lymph nodes should be performed to confirm malignancy if this would change management.** Recommendation rating: B

Thyroid 19:1167-1214, 2009

Preoperative US Changes Operation in Patients with Thyroid Cancer

<table>
<thead>
<tr>
<th>#pts</th>
<th>US+ PE- nodes</th>
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<tbody>
<tr>
<td>Primary 107</td>
<td>21 (20%)</td>
</tr>
<tr>
<td>Persistent 28</td>
<td>9 (32%)</td>
</tr>
<tr>
<td>Recurrent 77</td>
<td>52 (63%)</td>
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</table>


The most important reason for preoperative ultrasound.

“If they are going to look for it AFTER the operation, you better look for it BEFORE the operation.”
The Bethesda System for Reporting Thyroid Cytopathology

Nondiagnostic/unsatisfactory
Benign
Atypia or follicular lesion of undetermined significance
Follicular neoplasm
Suspicious for malignancy
Malignant


ATA Guideline 2009: FNA Results

ATA Guideline 2009: Recommendation #11

- If the nodule is benign on cytology, further immediate diagnostic studies or treatment are not routinely required. Recommendation rating: A

Thyroid 19:1167-1214, 2009
ATA Guideline 2009:
Recommendation #25a

(a) Because of an increased risk for malignancy, total thyroidectomy is indicated in patients with indeterminate nodules who have large tumors (>4 cm), when marked atypia is seen on biopsy, when the biopsy reading is “suspicious for papillary carcinoma,” in patients with a family history of thyroid carcinoma, and in patients with a history of radiation exposure. Recommendation rating: A

Thyroid 19:1167-1214, 2009

ATA Guideline 2009:
Recommendation #25b

(b) Patients with indeterminate nodules who have bilateral nodular disease, or those who prefer to undergo bilateral thyroidectomy to avoid the possibility of requiring a future surgery on the contralateral lobe, should also undergo total or near-total thyroidectomy. Recommendation rating: C

Thyroid 19:1167-1214, 2009

ATA Guideline 2009:
Recommendation #26

For patients with thyroid cancer >1 cm, the initial surgical procedure should be a near-total or total thyroidectomy unless there are contraindications to this surgery. Thyroid lobectomy alone may be sufficient treatment for small (<1 cm), low-risk, unifocal, intrathyroidal papillary carcinomas in the absence of prior head and neck irradiation or radiologically or clinically involved cervical nodal metastases. Recommendation rating: A

Thyroid 19:1167-1214, 2009

ATA Guideline 2009:
Recommendation #29

Completion thyroidectomy should be offered to those patients for whom a near-total or total thyroidectomy would have been recommended had the diagnosis been available before the initial surgery. This includes all patients with thyroid cancer except those with small (<1 cm), unifocal, intrathyroidal, node-negative, low-risk tumors. Therapeutic central neck lymph node dissection should be included if the lymph nodes are clinically involved. Recommendation rating: B

Thyroid 19:1167-1214, 2009
ATA Guideline 2009: Recommendations #11, 25, 26, 29

- FNA benign – observe
- FNA malignant – thyroidectomy (total)
- FNA suspicious/follicular – at least lobectomy

Thyroid Cancer: Lymph Nodes

- Central vs. Lateral neck lymph nodes
  - Central involvement more common than lateral
  - Central nodes harder to diagnose by ultrasound
  - Central neck reoperation is higher risk
- Therapeutic vs. Prophylactic neck dissection

ATA Guideline 2009: Neck Nodes

Central Neck Lymph Nodes

- Level VI, central neck
  - Pretracheal
  - Paratracheal
    - Ipsilateral
    - Contralateral
- “Central neck dissection”
  - Pretracheal plus at least one paratracheal (unilateral)
ATA Guideline 2009: Recommendation #27a

(a) Therapeutic central-compartment (level VI) neck dissection for patients with clinically involved central or lateral neck lymph nodes should accompany total thyroidectomy to provide clearance of disease from the central neck. Recommendation rating: B

Thyroid 19:1167-1214, 2009

ATA Guideline 2009: Recommendation #27b

(b) Prophylactic central-compartment neck dissection (ipsilateral or bilateral) may be performed in patients with papillary thyroid carcinoma with clinically uninvolved central neck lymph nodes, especially for advanced primary tumors (T3 or T4). Recommendation rating: C

Thyroid 19:1167-1214, 2009

ATA Guideline 2009: Recommendation #27c

(c) Near-total or total thyroidectomy without prophylactic central neck dissection may be appropriate for small (T1 or T2), noninvasive, clinically node-negative PTCs and most follicular cancer. Recommendation rating: C

Thyroid 19:1167-1214, 2009

ATA Guideline 2009: Recommendation #28

Therapeutic lateral neck compartmental lymph node dissection should be performed for patients with biopsy proven metastatic lateral cervical lymphadenopathy. Recommendation rating: B

Thyroid 19:1167-1214, 2009
ATA Guideline 2009:
Recommendations #27,28

- Therapeutic Dissection: Always
  - central or lateral neck
- Prophylactic Lateral Dissection: Never
- Prophylactic Central Dissection: Controversial

Recurrences (Lymph Nodes)

ATA Guideline 2009:
Recommendation #50a

- 6-12 months after remnant ablation
- Ultrasound neck
  - Surgery if US +
  - rhTSH or THW
- CT (w/o contr) – I131 tx

(a) Therapeutic comprehensive compartmental lateral and/or central neck dissection, sparing uninvolved vital structures, should be performed for patients with persistent or recurrent disease confined to the neck. Recommendation rating: B
ATA Guideline 2009: Recommendation #50b

- **(b)** Limited compartmental lateral and/or central compartmental neck dissection may be a reasonable alternative to more extensive comprehensive dissection for patients with recurrent disease within compartments having undergone prior comprehensive dissection and/or external beam radiotherapy. Recommendation rating: C

*Thyroid 19:1167-1214, 2009*

“Pythian Nodes” (ultrasound-positive non-palpable nodes)

- “…Pythia was the Priestess of Delphi whose utterance was ambiguous and can be interpreted in different ways. These nodes are like Pythia’s utterance: we hear it, but we may not understand what it really means…”


Hook Needle-Guided Excision of Recurrent Differentiated Thyroid Cancer in Previously Operated Neck Compartments: A Safe Technique for Small, Nonpalpable Recurrent Disease

*FIG. 1. Transverse ultrasound image showing the hook needle inserted into a metastatic lymph node. A, Landmarks. Long white line, Hook needle; stcm sternocleidomastoid muscle; empty arrow, internal jugular vein; white arrow, carotid artery*


Excision of Recurrent Thyroid Cancer in Previously Operated Neck Compartments: Guided by Intraoperative Ultrasound-Directed Blue Dye Injection

- Same ultrasound preop/intraop
- After induction and positioning
- TB syringe, 0.1-0.2 ml
- 1/10-20 dilution of methylene blue

Management of Differentiated Thyroid Cancer at UCSF (2010)

- Total thyroidectomy (except for small incidental ca)
  - Preop ultrasound. (+/- intraop nerve monitoring).
- Therapeutic node dissection (large, palpable or US)
  - Therapeutic re-resection for recurrences
- Prophylactic central neck dissection (if aggressive)
- Radioiodine ablation and therapy (rhTSH or THW)
- Thyroid hormone to suppress TSH
- Neck US & rhTSH-stimulated Tg follow up, +/- RAI
- Rarely external radiation and chemotherapy
  - in advance disease for palliation

Thyroid Cancer Lymph Nodes: Summary

- “ATA guidelines” 2009 revision
- “Bethesda System” FNA cytology report
- “Node-Mapping” routine preoperative
- “Levels II through VI neck nodes”
- “Therapeutic” vs. “prophylactic” node dissection
- “Ultrasound-guided blue-dye-injection” re-op node dissection

Thank You