The Second World Congress on Thyroid Cancer

July 10-14, 2013

Sheraton Centre Toronto
Toronto, Ontario
Canada

A Multi Disciplinary Congress with Leaders in the Field
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Panel Discussions
Lectures & Debates

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2nd World Congress on Thyroid Cancer
an international meeting on thyroid cancer and nodules
July 10-14, 2013
Sheraton Centre Toronto
123 Queen Street, West Toronto, Canada

Gregory Randolph
-No Disclosures
2013 World Congress on Thyroid Cancer
Central Neck Dissection Panel
Henning Dralle Moderator

Prophylactic central neck dissection for PTC

Greg Randolph
Harvard Medical School
Prophylactic CND

It's crazy not to!!

It's crazy!!
Papillary cancer nodal surgery and the advisability of prophylactic central neck dissection: "Quid sum, non nocere"

Gregory W. Randolph, MD, Boston

From the Department of Otolaryngology, Massachusetts Eye and Ear Infirmary, Division of Surgical Oncology, Endocrine Surgery Service, Department of Surgery, Massachusetts General Hospital, Harvard Medical School, Boston, MA
Prophylactic CND (pCND)

- A prophylactic (or elective) neck dissection is performed without the preoperative demonstration of clear macrometastases and is intended to harvest, at best, microscopically positive nodal disease or normal uninvolved nodes.

Randolph Surgery 2010
Consensus statement on the terminology and classification of central neck dissection for thyroid cancer


Carty SE, Cooper DS, Doherty GM, Duh QY, Kloos RT, Mandel SJ, Randolph GW, Stack BC Jr, Steward DL, Terris DJ, Thompson GB, Tufano RP, Tuttle RM, Udelsman R.

Management Guidelines for Patients with Thyroid Nodules and WDTC

Cooper et al. Thyroid 2006

- **R28** ROUTINE central compartment neck dissection should be considered for patients with PTC. Near total or total thyroidectomy alone may be appropriate for follicular cancer and when followed by RAI, may provide an alternative approach for PTC.

Recommendation B
Management Guidelines for Patients with Thyroid Nodules and WDTC

Cooper et al. Thyroid 2009

- **R27b** 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).
  
  EBM Recommendation Rating: C

- **R27c** Near-total or total thyroidectomy without prophylactic central neck dissection may be appropriate for small (T1 or T2), non-invasive clinically node negative papillary thyroid cancers, and most follicular cancer.

  EBM Recommendation Rating: C
• ATA thinks (level C) stratification may be important in pCND
Prophylactic Central Neck Dissection

- Micro LN mets
- Upstage disease
- Tg lower
- Revision is difficult

+ 

- Micro LN mets
- Upstage disease
- Tg not a surgical endpoint
- Revision w experience is doable in those few who need it
- No improvement survival or recurrence

*Shindo Arch Otol 2008
**Sywak Surgery 2006
Mazzaferri et al Thyroid 2009
pCND and Tg

2011 Surgery Popadich

- N=606
- sTg initial different with pCND
- Tg NOT statistically different at final F/U

2012 Ann Surg Onc Lang

- Tg NOT statistically different 6mo post ablation
• ? Benefit of pCND – not lower Tg
• ?? rates of recurrence
Rates of recurrence

Macroscopic vs Microscopic nodal disease
Incidence of Macromet in Relation to Age of Patients

Clinically recognizable
Detection by PE, US or intraop

Gemensnjar 03, Cranshaw 08, Gilliland 92, Hay 98, Bardet 08
Micromet prevalence overall

- Micromet in clinically N0 neck operated on prophylactically (9 studies)

  23-81%
Prophylactic Central neck dissection

**Micromets present in central neck:**

- **Sywak 2006** in PE, US neg PTC >1cm
  - 38% patients had micromets
  - Recurrence untreated 1.3% (treating 98.7%)

- **Doherty 2010** : in PE, US neg PTC >1cm
  - 62% had micromets
  - Recurrence ~ 6% (treating 94%)
Micromet surgical results

- Noguchi 70 prophylactic neck dissections >50% LN <3mm

- Roh 08 prophylactic central dissections mean LN size 3.5mm +/-2.4mm (range 1-10mm)

- Verges 10 prophylactic central dissections max LN <5mm in 66% and <10mm in 95%

- Teixeira 11 US and palpation-, 25%+LN, ~2mm
Micromets

Macromets

35%

21-81%
The **Prognostic Significance** of Nodal Metastases from Papillary Thyroid Carcinoma Can Be Stratified Based on the **Size** and Number of Metastatic Lymph Nodes, as Well as the Presence of Extranodal Extension

Gregory W. Randolph, Quan-Yang Duh, Keith S. Heller, Virginia A. LiVolsi, Susan J. Mandel, David L. Steward, Ralph P. Tufano, and R. Michael Tuttle for the American Thyroid Association Surgical Affairs Committee’s Taskforce on Thyroid Cancer Nodal Surgery
PTC rates of nodal recurrence

cN0  Micro+  Macro+
PTC rates of nodal recurrence

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<thead>
<tr>
<th>Condition</th>
<th>Rate of recurrence</th>
<th>References</th>
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<tr>
<td>PTC cN0</td>
<td>0-9% Av ~4%</td>
<td>Wada 08, Cranshaw 08, Bardet 08</td>
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<td>PTC cN0, pN1</td>
<td>4-11.5% Av ~6%</td>
<td>Bardet 08, Cranshaw 08, Ito 04</td>
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<td>PTC cN1</td>
<td>13-28% Av ~21%</td>
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</table>
PTC rates of nodal recurrence

cN0: 4%
Micro+: 6%
Macro+: 21%
Benefit of pCND may not be easily measured in rates of recurrence
LN prognosis

- Traditionally nodal mets thought to increase loco regional recurrence rather than survival
  
  Sugitani 99, Wada 03, Ito 04, 06, Coburn 92, Hughes 96, Sata 98, Mazzeferri 94, Loh 92, Leboulleux 07, Hay 93, Shaha 96, Hughes 96, Degroot 90, Cunningham 90

- LN omitted from AMES prognostic schemes
  
  AGES
  MACIS
  
  Cady 88, Hay 87
LN prognosis-relationship to Survival

1- Podnos 05 SEER database 9,904 patients with papillary or follicular thyroid cancer, that lymph node metastases, age> 45 years, distant metastasis, and large tumor size significantly predicted poor outcome on multivariate analysis. All-cause survival at 14 years was 82% for papillary thyroid cancer without lymph node and 79% with lymph node metastases (P< 0.05).

2- Lundgren 06 Large (N=5123) recent case-control study also concluded that the presence of lymph node metastases was associated with a higher mortality rate (OR=2.5; 95% CI, 1.6-4.1)

3- Zaydfudim 08 SEER 30,504 patients, >45 years +LN was associated with 46% increased risk of death (P<0.001)
Fig. 2. Overall survival of patients with papillary carcinoma based on lymph node status.
LN prognosis: Summary

- Increase risk of recurrence
- Effect on survival > 45 years old
• ? Older pts and pCND
Can we offer pCND if Braf +?

1- Clear Association between nodal disease and Braf positivity
2- Clear association between risk of nodal recurrence and Braf positivity
3- Limited literature- 2 prospective studies with pCND – may show benefit relationship

Consider pCND if Braf +

• + ?Braf pCND
**pCND and Staging**

**“Microscopic upstaging”**

- **Doherty 2010:** prophylactic CND:
  
  29% of pts > 45 years upstaged by prophylactic CND

- **Shindo 2006:** prophylactic CND:
  
  39% of pts > 45 years upstaged by prophylactic CND

- **Serra 2005:** prophylactic CND:
  
  39% upstaged by prophylactic CND
TNM 2010

TX: Primary tumor cannot be assessed
T0: No evidence of primary tumor
T1a: Tumor \( \leq 1 \text{cm} \) limited to the thyroid
T1b: Tumor > 1 cm but \( \leq 2 \text{cm} \) limited to the thyroid
T2: Tumor > 2-4 cm limited to the thyroid
T3: Tumor > 4 cm limited to the thyroid or any tumor with minimal extrathyroid extension (e.g; extension to sternothyroid muscle or perithyroid soft tissues)
T4a: Tumor of any size with extension beyond the thyroid capsule and invades any of the following: subcutaneous soft tissues, larynx, trachea, esophagus, recurrent laryngeal nerve
T4b: Tumor invades prevertebral fascia, mediastinal vessels, or encases carotid artery

Nx: Regional lymph nodes cannot be assessed
N0: No regional lymph node metastasis
N1a: Metastases in pretracheal and paratracheal, including prelaryngeal and delphian lymph nodes
N1b: Metastases in other unilateral, bilateral or contralateral cervical or upper mediastinal lymph nodes

The Mx classification has been eliminated
M0: No distant metastases
M1: Distant metastases

TNM Staging 2010

Age < 45 years
- Stage I: Any T, any N, M0
- Stage II: Any T, any N, M1
- Stage III, Stage IV: do not exist

Age > 45 years
- Stage I: T1N0M0
- Stage II: T2N0M0
- Stage III: T3N0M0 or T1T2T3,N1aM0
- Stage IVA: T1T2T3N1bM0 or T4a Any N M0
- Stage IVB: T4b Any N M0
- Stage IVC: Any T, Any N, M1

pCND:
-- N0 to N1a
-- If over 45yrs
stage 1 to stage III

• ? pCND in staging information
pCND as information to endocrine

• If LN resected
  - if + can be considered for RAI
  - if negative RAI could be withheld more readily

• If LN not resected [Endocrinologist]
  - two possibilities- they are negative or they were + and not resected
Consensus Statement on the Terminology and Classification of Central Neck Dissection for Thyroid Cancer

The American Thyroid Association Surgery Working Group with Participation from the American Association of Endocrine Surgeons, American Academy of Otolaryngology—Head and Neck Surgery, and American Head and Neck Society


• The safety of unilateral paratracheal dissection?
Central Compartment Boundaries

- Superior
  - Hyoid bone
- Lateral
  - Carotid arteries
- Anterior
  - Superficial layer of deep cervical fascia
- Posterior
  - Prevertebral fascia
- Inferior
  - Innominate artery on right and point where it crosses trachea on left
CND Classification
Indicating Surgical Intent: Elective vs. Therapeutic

• Elective / prophylactic
  – Clinically and imaging node negative (N0)
  – Includes intra-operative inspection / palpation

• Therapeutic
  – Clinically or imaging node positive (N1)

• Surgical indication (Elective vs. Therapeutic)
  should be stated in op report and any publication
CND Classification

Indicating Surgical Extent: Unilateral vs. Bilateral

- **Unilateral**
  - Ipsilateral paratracheal nodal basin
  - Pretracheal and prelaryngeal nodal basins

- **Bilateral**
  - Bilateral paratracheal nodal basins
  - Pretracheal and prelaryngeal nodal basins

- Surgical extent (Unilateral vs. Bilateral CND) should be stated in op report and any publication
Right paratracheal region

Left paratracheal region

Right Vagus Nerve

Right Laryngeal Nerve

Left LN
<table>
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<th>Complication</th>
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<th>TT + CLND</th>
<th>P-Value</th>
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TT, total thyroidectomy; TT + CLND, total thyroidectomy with central neck dissection.
Utility of CT?
Rationale to include CT in preop assessment of papillary cancer

• **Repeatable**—Always includes the entire neck and mediastinum

• **Sees all areas**—Retropharnx, parapharngeal LN and lesions behind sternum, clavicle, larynx

• **Thyroid info**—in relation to surrounding cervical viscera and primary invasion information

• Short delay in I131
Papillary thyroid carcinoma nodal surgery directed by a preoperative radiographic map utilizing CT scan and ultrasound in all primary and reoperative patients

David Lesnik, MD,1 Mary Elizabeth Cunnane, MD,2 David Zurakowski, PhD,3 Gul Ozbilien Acar, MD,4 Cenk Ecevit, MD,4 Alasdair Mace, MD,5 Dipti Kamani, MD,1 Gregory W. Randolph, MD1

1Division of Thyroid and Parathyroid Surgery, Massachusetts Eye and Ear Infirmary, Department of Otolaryngology, Harvard Medical School, Boston, Massachusetts, 2Department of Radiology, Massachusetts Eye and Ear Infirmary, Harvard Medical School, Boston, Massachusetts, 3Departments of Anesthesiology and Surgery, Children’s Hospital, Harvard Medical School, Boston, Massachusetts, 4Department of Otorhinolaryngology, Goztepe Research and Education Hospital, Istanbul, Turkey, 5Charing Cross Hospital and St. Mary’s Hospital, Imperial College London, United Kingdom, 6Division of Surgical Oncology, Endocrine Surgery Service, Department of Surgery, Massachusetts General Hospital, Boston, Massachusetts.

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# CT/US in Primary PTC patients

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CT/US in Revision PTC patients

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CT correctly identifies macroscopic nodal disease missed by US allowing for correct expansion of surgery in 26% overall, 25% for primary patients and 27% for revision patients.
FIGURE 5. Central neck lymph node (arrows) seen only on CT, missed on ultrasonography (axial A and coronal B). Node was surgically excised.
FIGURE 8. CT scan showing Node of Rouvier (right retropharyngeal node) not seen on ultrasonography (axial A and coronal B)
pCND considered for

• T3, T4, (high grade histology)
• Pts >45y
• Braf + tumors
• Staging information ~ endocrine
• Unilateral may help
• CT may help in +macroscopic LN evaluation
primum, non nocere

Thank you