Long Term Follow-up Management of Differentiated Thyroid Cancer

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“Oh Mommy, a thyroid cancer story—goody!”

General Concepts in Thyroid Cancer Management

- Complete surgery
- Selective use of RAI
- Careful f/u, to ensure disease-free status, defined as:
  - No clinical evidence of disease
  - Negative imaging
  - Undetectable Tg

Follow-up Management of Differentiated Thyroid Cancer

- Use of thyroglobulin determinations
- Use of high resolution ultrasound
- TSH—how low to go?
- When is RAI of benefit?
Follow-up Management of Differentiated Thyroid Cancer

- Use of thyroglobulin determinations

Utility of Tg Measurements in Thyroid Ca—General Concepts

- Tg is not a diagnostic test for Ca
- TSH status is necessary for Tg interpretation
- Presence of Tg after Tdx and RAI indicates persistent disease.
- While Tg antibodies interfere with Tg determinations, antibody trends are helpful.
- Unstimulated Tg appears adequate (USC method) for followup.

Mass of thyroid tissue
- goiter
- thyroid nodular disease
- iodine deficiency
- thyroid dysmorphogenesis
- 20 thyroid neoplasms
- thyroid agenesis
- thyroid atrophy
- thyroidectomy
- TSH suppression

Thyroid Injury
- thyroid surgery
- fine-needle aspiration Rx.
- radiodine ¹³¹I Rx.
- thyroiditis

Circulating Thyroglobulin (Tg concentration)

TSH Receptor Stimulation
- TSH (endogenous & recombinant)
- high hCG (pregnancy)
- TSAb (Graves’ hyperthyroidism)

Effect of Injury on Serum Tg Concentrations

Serum Tg ng/mL

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<tr>
<th>INJURY</th>
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<tr>
<td>Thyroidectomy</td>
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<tr>
<td>10,000</td>
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INJURY

- Thyroidectomy: Feldt-Rasmussen JHE 5:161, 1982
- FNAB: Luboshitzky Endoc Pract 12:264, 2006
- Thyroiditis: Smallridge JCEM 62:1213, 1986
Utility of Tg Measurements in Thyroid Ca—Points to Remember

- Tg is of no help as a diagnostic test for Ca.
- TSH status is necessary for Tg interpretation

- Presence of Tg after Tdx and RAI indicates persistent disease.
A Rise in Tg During TSH Suppression Means Disease

Utility of Tg Measurements in Thyroid Ca—
Points to Remember

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Prevalence and Clinical Significance of TgAb in DTC Patients

Serial TgAb Measurements can be used as a Surrogate Tumor-Marker

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- While Tg antibodies interfere with Tg determinations, antibody presence and trends are helpful.
- Unstimulated Tg appears adequate for followup (along with US, eg).

TSH-Stimulated Tg measurements are not 100% Reliable for Detecting Disease (340 Consecutive Patients)

- No evidence of disease
- Uptake in thyroid bed
- Lymph nodes detected by ultrasound
- Lung metastasis
- Bone metastasis

So, the use of rhTSH stimulation of Tg and WBS for follow-up is becoming less useful; ATA guidelines currently being revised.
Follow-up Management of Differentiated Thyroid Cancer

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Ultrasound Followup for Tumor Recurrence

- Lymph nodes—75 %
- Thyroid bed—20 %
- Muscle, etc—5 %

Cervical Adenopathy

US >> Palpation

- Benign
  - Small, oval, cylindrical
  - Hyperechoic hilus
  - Distal
    - Submandibular nodes - in majority of patients
- Malignant
  - CA++
  - Cystic spaces
  - Round

Cervical Adenopathy: Benign
What about other imaging, with/without Tg?

Snozek et al JCEM 92:4278, 2007

What About Other Imaging?

- CT, PET/CT, with/without rhTSH—reserve for Tg +/US – patients.
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Utility of Radioactive Iodine

- Ablation of normal thyroid tissue remnants
- Treatment of persistent disease
- WBS after I 131

Indications for RAI

- Very low risk Ca (1 cm +/-, unifocal, no mets—*not indicated*
- High risk—T 2-4, ETE, N1, M1—100 mci +
- Low to moderate risk—multiple LN’s, younger—“it all depends.”

Haugen, et al Thyroid 2007:17, 687

Low Risk (MACIS <6) Papillary Thyroid Carcinoma treated at Mayo during 1970-2000

- Tumor Recurrence in 636 Node-Negative Patients

Low Risk (MACIS <6) Papillary Thyroid Carcinoma treated at Mayo during 1970-2000

- Tumor Recurrence in 527 Node-Positive Patients
Survival for “low risk” PTC (MACIS < 6)

![Survival Graph]

- **I^131 Ablation (n=498)**
- **No Ablation (n=665)**

- **1,163 patients; total or near-total TTX; P= 0.64**

**Summary (of the USC Method)**

- Follow-up with Tg and US.
  - Low risk—“undetectable” Tg and neg US—follow with Tg.
  - Incidental micro PTC where lobectomy done—Tg, and repeat US in 6-12 months.
  - Higher risk—Tg and US 3-6 months post-op (and RAI prn), and then Tg,US yearly. Other imaging (CT, PET) according changing Tg values, staging.
- Antibody trends useful for persistent/recurrent disease.
- RAI reserved for higher risk patients.

**Efficacy of Using Adjuvant Radioiodine**

Meta-analysis - Effectiveness of RAI

- Stage 1: No evidence of improved outcomes after adjuvant radiiodine Rx.
- Stage II: Evidence for improved outcomes with radiiodine is weak.
- Stages III & IV: Some evidence that RAI Rx. is associated with improved outcomes.

**CONCLUSIONS:**

- Stage 1: No evidence of improved outcomes after adjuvant radiiodine Rx.
- Stage II: Evidence for improved outcomes with radiiodine is weak.
- Stages III & IV: Some evidence that RAI Rx. is associated with improved outcomes.

**PTC (n = 589)**

TNM Classification

- **Stage I (62%)**
- **Stage II (14%)**
- **Stage III & IV (Stages III+IV) (24%)**

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**Thank You For Your Attention!**

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