Clinical Impact of Second Opinion in Thyroid FNA
A Study of 922 Inter-institutional Consultations

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Conflict of interest - None
What is 2\textsuperscript{nd} opinion?

Outside institution

Review of Pathology material

Treating facility

Major therapeutic endeavor
Second opinion – recognized as a means to reduce error
NSLIJ Experience:
2nd Opinion on Thyroid FNAs
1. To assess the magnitude of discrepant cytologic diagnosis on cases of thyroid FNA referred to NSLIJ
2. To determine the impact on patient management
   • medical vs. surgical
   • partial vs. total thyroidectomy
Why Thyroid?

- Thyroid – disproportionately high discrepancy rate in literature

- Example:
  - Westra WH, Kronz JD, Eisele DW. The impact of second opinion surgical pathology on the practice of head and neck surgery: a decade experience at a large referral hospital.

  *Thyroid – 1% of cases but 22% of all discrepancies!!*
# NCI/Bethesda Terminology

## Table 9.1: Bethesda System for Reporting Thyroid Fine-Needle Aspiration Interpretations

<table>
<thead>
<tr>
<th>Diagnostic Category</th>
<th>Risk of Malignancy (%)</th>
<th>Usual Management*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient for diagnosis</td>
<td>1–4</td>
<td>Repeat fine-needle aspiration with ultrasound guidance</td>
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<tr>
<td>Benign</td>
<td>&lt;1%</td>
<td>Follow clinically</td>
</tr>
<tr>
<td>Atypical cells of undetermined significance</td>
<td>≈5–10% [t1]</td>
<td>Repeat FNA</td>
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<tr>
<td>Suspicious for a follicular neoplasm</td>
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<td>Lobectomy or thyroidectomy (± FS)</td>
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<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>• Suspicious for metastatic tumor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malignant</td>
<td>97–99</td>
<td>Thyroidectomy</td>
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* Actual management may depend on other factors besides the fine-needle aspiration result.

† Estimate based on resections performed after "repeated atypicals."
Methods

- Laboratory information system (LIS) search of thyroid FNA cases referred to NSLIJ for second opinion
- January 2008 – December 2009
- 922 cases
- Parameters included in the study:
  - Patient demographic data (age, sex)
  - Type of referring institution
  - Outside diagnosis
  - In-house diagnosis (2nd opinion)
  - Result of surgical follow-up/ Repeat FNA (if available)
Methods

• Original and second opinion diagnoses were compared and categorized as
  – no disagreement, or
  – minor disagreement*, or
  – major disagreement*

• *Defined as a 1 or 2-step deviation respectively on a scale of non-diagnostic, benign, atypical, suspicious for neoplasm, suspicious for malignancy, and malignant.

• Follow-up was obtained by a review of the LIS
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† Estimate based on resections performed after "repeated atypicals."
Results

- 922 cases
- F:M = 4.5:1
- Mean and median age: 53 years (11-90 years)
- The outside institutions included large referral centers, community hospitals, and independent laboratories.
Results

Number of discrepancies: 122/922 (13%) cases
  a) Major: 44 (36%)
  b) Minor: 78 (64%)

Total Discrepancies = 122 cases
Results

Change in patient management: 75/122 cases

a. Surgical to medical: 33 (27%)
b. Medical to surgical: 29 (24%)
c. Partial vs. total thyroidectomy: 13 (11%)
Results

Correlation of type of discrepancy and change in patient mgmt:

– 44 **major** discrepancies,
  • 38 (**89%**) resulted in a change in patient management

– 78 **minor** discrepancies,
  • 37 (**49%**) resulted in a change in patient management
Cytology–Surgical correlation in major discrepancies:

1. 2nd opinion diagnosis – 25/44 cases correlate (57%)
2. No surgical follow-up – 16/44 cases (36%)
3. Outside diagnosis – 3/44 cases correlate (7%)
## Review of Literature

<table>
<thead>
<tr>
<th>Authors</th>
<th>Focus of study</th>
<th># of cases</th>
<th>Duration of study (yrs)</th>
<th>Prospective/Retrospective</th>
<th>Discrepancies</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baloch, Z. W. et al</td>
<td>Thyroid FNAs</td>
<td>183</td>
<td>1.5</td>
<td>Prospective</td>
<td>110</td>
<td>Total: 110 (60%) Discordant diagnosis = change in Mx</td>
</tr>
<tr>
<td>Layfield, L.J. et al</td>
<td>Cytology specimens</td>
<td>146</td>
<td>2</td>
<td>Retrospective</td>
<td>11 13</td>
<td>Total: 24 (16%) 2 institutions; at one, Thyroid = 8% cases but 25% disagreements. Overall, thyroid = 9.6% cases but 17% disagreements</td>
</tr>
<tr>
<td>Murphy, W.M. et al</td>
<td>Urology surgicals</td>
<td>150</td>
<td>1.5</td>
<td>Not specified</td>
<td>14 15</td>
<td>Total: 29 (19%)</td>
</tr>
<tr>
<td>Bomeisl P.E., Jr</td>
<td>Cytology FNA specimens</td>
<td>742</td>
<td>4.5</td>
<td>Retrospective</td>
<td>69 132</td>
<td>Total: 201 (27%) No diagnostic disagreement but pertinent information (e.g. tumor size, grade, vascular/perineural invasion, etc) missing in 35 (5%) cases</td>
</tr>
<tr>
<td>Tsung, J.S.H</td>
<td>Surgical path</td>
<td>715</td>
<td>1</td>
<td>Retrospective</td>
<td>42</td>
<td>Total: 42 (6%) Discrepancy = any change resulting in a significant modification in therapy or prognosis</td>
</tr>
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<td>Westra, WH</td>
<td>Head &amp; Neck surgicals</td>
<td>814</td>
<td>10</td>
<td>Retrospective</td>
<td>54 (7%)</td>
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</tr>
<tr>
<td>Bajaj</td>
<td>Thyroid FNAs</td>
<td>922</td>
<td>2</td>
<td>Retrospective &amp; prospective</td>
<td>44 78</td>
<td>Total: 122 (13%)</td>
</tr>
</tbody>
</table>
“I’ll be the doctor and you be from managed care.”
Cost-benefit analysis

Estimation of direct costs

- Cost of 2nd opinion per FNA consult (CPT 88321) = $97
  (922 x 97 = $89,434)

- Cost of surgery (average) per case = $31,200

- Savings from change in management
  (Surgical to medical) in 33 cases = $1,029,600

- Total savings in 33 cases
  (Subtracting cost of 2nd opinion from surgery savings) = $940,166
Cost-benefit analysis

Estimation of indirect costs

- Placing a $ value on a changed diagnosis – a formidable challenge
- Cost of emotional burden & potential litigation is not easily quantified
- Indirect costs vary notably from case to case
- 11 patients - partial rather than total thyroidectomy, obviating the need for lifelong thyroid replacement
Medical-cost Impact of Second-opinion Pathology on Prostate Needle Biopsies


- 2nd opinion resulted in actual cost savings from reduced surgery
- For every $1 spent on second opinion review, $1.91 were saved
Recommendation

• Importance of a quality control measure to review outside cytology slides
  – especially thyroid FNAs where a cytology diagnosis is only confirmed by a surgical excision
2nd opinion - A Perfect solution?

- Increased TAT
- Creates confusion when pathologists disagree
- Increased costs for patients and institutions
- Potentially negative impact of encouraging patients to doubt the expertise of their physicians
- Does not influence false-neg due to sampling inadequacies
Existing literature supports institutional 2nd opinion as a "valuable patient care activity"

Important considerations include:
- Little consensus on the manner and scope of 2nd opinion
- Defining the nature of interpretive disagreements
- Professional conduct
- Access to clinical and imaging findings to integrate with morphology
- Reimbursement
Conclusions

• Inter-institutional Consultation is a complex issue with many challenges and no clear-cut answers
• 2nd opinion is intended to reduce error by a strategy known as redundancy
• Molecular diagnostic testing will be a valuable addition to subjective morphologic criteria
• At the forefront of obstacles is the subject of added cost
• Is that more important than patient safety?
“If you don’t mind, I would like to have a second opinion!”
References


• Classification And Cytologic Diagnosis Of Thyroid Lesions *Diagn. Cytopathol.* 2008;36:425–437.


• The role of second opinion pathology in the management of lesions of the head and neck Kronz and Westra. Current Opinion in Otolaryngology & Head and Neck Surgery 2005, 13:81—84

• Interinstitutional consultation in fine-needle aspiration cytopathology Bomeisl Jr., et al. *Cancer Cytopathol* Published Online: 23 Jun 2009