Use and Abuse of Onsite Adequacy for EUS-FNA of the Pancreas

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EUS imaging
More bang for the Buck?

- Tumor Location
- Tumor Size - Prognostication
- Tumor Extent
- Vascular Involvement – Resectability
- Staging: Tumor, Lymph Node, Metastasis
- Cost Efficiency
EUS Imaging

- EUS images to an extent can provide information on tissue architecture
Early Detection Is The Key To Success

Resections = 150/530 tumors (28%)
Stage:  
1A  9 (6%)
1B  21 (14%)  
2A  30 (20%)
2B  84 (56%)
Unknown  8 (5.3%)

T.S: > 0.5 cms
T.S: > 2.0 cms
CT-FNA

EUS-FNA

No. of Samples


Unsat          Positive        Negative         Atypical        Total Cases

Percutaneous FNA
13%               42%                 26%                  19%                   84 (100%)
(1990-1999)

EUS-FNA
3%                66%                 25%                    6%                   96 (100%)
(2000-2002)


CT-FNA          EUS-FNA

Endosonography 2011. Chapter 21
Acquisition of adequate cytology sample holds key to the success for improved diagnostic accuracy for EUS-FNA of the pancreas.
Qian and Hecht suggested that US/CT-guided biopsies may be more accurate and sensitive for documenting malignancy than EUS, but noted that EUS-guidance was used in more difficult lesions [41]. In contrast,....... "Jhala et al. demonstrated that EUS-FNA was superior to CT-FNA in obtaining adequate cells from neuroendocrine tumors of the pancreas for the diagnosis and performing additional immunohistochemical stains [42]."

EUS-FNA of the Pancreas
Factors that help Improve Diagnostic Performance

Endosonographers experience
  Lesion Location
    (Uncinate lesions harder than pancreas head lesions)
Cytopathologist experience
  Onsite Adequacy
Communication between endosonographers and cytopathologists
Understanding access to pancreas will help reduce pitfalls

What Impacts Adequacy

- Onsite Assessment
- Operator Experience
- Technical Difficulties
- Type of Needle
- Lesion Location
- Number of Passes

Adequate Sample

Interpretation
Factors Impacting Adequacy

EUS-guided FNA of solid pancreatic masses: a learning curve with 300 consecutive procedures
GASTROINTESTINAL ENDOSCOPY Volume 61, No. 6 : 2005

<table>
<thead>
<tr>
<th>Reference</th>
<th>EUS-FNAs</th>
<th>Adequacy (%)</th>
<th>Pathologist Presence</th>
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<tbody>
<tr>
<td>Wiersema et al 1997</td>
<td>554</td>
<td>524 (94.6)</td>
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<td>118 (90.7)</td>
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<td></td>
<td>113</td>
<td>90 (79.6)</td>
<td>Absent</td>
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<tr>
<td>Jhala et al, 2004</td>
<td>209</td>
<td>201 (96)</td>
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Trend Continues

Onsite Specimen Adequacy/Interpretation

Advantages Offered By Labs

• **Improved specimen collection**
  
  – Advantage of reviewing direct smears as well as samples collected in transport medium
  
  – Reduces frequency of inadequate samples
  
  – Reduces frequency of indeterminate rates
Advantages of Providing Onsite Adequacy/Interpretation

Those Intangibles

- Improves communication with clinical teams.
- Provides information to clinical teams whether target lesions are sampled.
- Allows better collection of samples.
- Allows appropriate triage of samples.
- Improves efficiency in health care delivery.
A negative biopsy should be confirmed by at least one repeat EUS biopsy.
Advantages for Patients

• Reduces Procedure Times
• Potentially reduces complication rates
• Potential to reduce second visits
• Improves informed management decisions
On site Specimen Adequacy

- Pathologist
- Cytotechnologists
- Advanced Trainees
- Nursing Staff
- Endosonographers
- No Onsite Adequacy
Pathologists Provided Adequacy Assessments
# Specimen Adequacy and Onsite Pathologists

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*Cancer (Cancer Cytopathol) 2004;102:239–46.*
## Onsite Evaluation vs. No Onsite Evaluation

<table>
<thead>
<tr>
<th>Study</th>
<th>NO. OF Cases</th>
<th>Indeterminate Samples</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iglesias- Garcia et al AJG 2011</td>
<td>182</td>
<td>2.1%</td>
<td>0.02</td>
</tr>
<tr>
<td>Alshohalbani et al Can J Gastroenterol 2009</td>
<td>104</td>
<td>23%</td>
<td>0.001</td>
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</table>

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<thead>
<tr>
<th>Study</th>
<th>NO. OF Cases</th>
<th>Unsatisfactory Samples</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iglesias- Garcia et al AJG 2011</td>
<td>182</td>
<td>1%</td>
<td>0.002</td>
</tr>
<tr>
<td>Alshohalbani et al Can J Gastroenterol 2009</td>
<td>104</td>
<td>0%</td>
<td>NS</td>
</tr>
</tbody>
</table>
When CUSUM curve for 5 cytopathologists were assessed

The lowest score was achieved by a cytopathologist who had EUS-FNA experience and specialized training in gastrointestinal pathology.
So why not Pathologists?

- Time Commitments - Out weigh benefits
- Physical facilities make it impractical

CT-FNA: 48.7 minutes
  - USG- FNA: 44.4 minutes
  - Endoscopy – FNA: 56.2 minutes

88172 code does not provide enough compensation

*Cancer 2001;93(5):319-22.*

Significant time commitment leads to considerable disruption in workflow, both for individuals and labs. There is under compensation for adequacy assessment and diagnostic interpretation.

Role of Cytotechnologists
Cytotechnologists represent a good marriage between skill and resource allocation in many settings where assistance for image guided FNAs are needed.

Cancer (Cancer Cytopathol) 2012;120:177–84
Role of Cytotechnologists 
Onsite Adequacy

• Cytotechnologists and cytopathologists are comparably accurate in onsite assessments for specimen adequacy of EUS-guided pancreatic FNA. (n = 2426 from 2223 procedures)

Requires Training Cytotechnologists in interpretation of EUS-FNA samples

<table>
<thead>
<tr>
<th></th>
<th>Cytotechnologist</th>
<th>Cytopathologist</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre Training (n=107)</td>
<td></td>
</tr>
<tr>
<td>Adequacy</td>
<td>68% (73/107)</td>
<td>93% (100/107)</td>
</tr>
<tr>
<td></td>
<td>Post Training (n=95)</td>
<td></td>
</tr>
<tr>
<td>Adequacy</td>
<td>87% (83/95)</td>
<td>96% (91/95)</td>
</tr>
</tbody>
</table>

Dig Liver Dis, 2012,44: 311–314
FNA by Cytotechnologists
Disadvantages

• Lab Productivity Loss
  – e.g Calculated Lab Productivity loss for 7 EUS-FNA : ($1,274.12)
• No service Compensation
• Lack of CPT codes for service by cytotechnologists

Surgue C.  MBA, SCT ( ASCP), CMIAC

cytopathologymeeting.org/.../2011-ASC-Presentation
Real Time Telecytopathology
Real Time Telecytopathology

Acta Cytologica 2012;56(6):669-77
Advantages

• Average Time spent for TeleCyP on-site diagnosis: 49.2 s (range 15 - 165 seconds)

• Concordance w final cytopathology diagnoses in 35 / 38 (92%) cases

• Offers advantage of specimen adequacy by a pathologist

• Potential to harness the talents of advanced trainee as well as cytotechnologists

Acta Cytologica 2012;56(6):669-77
### Telecytopathology

#### Advantages

<table>
<thead>
<tr>
<th></th>
<th>Mean Time Conventional</th>
<th>Mean Time TeleCyP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cytotechnologist/Trainees</td>
<td>1.1 h</td>
<td>1.1 h</td>
</tr>
<tr>
<td>Pathologist</td>
<td>.73</td>
<td>.2 h</td>
</tr>
</tbody>
</table>

Utilized Judiciously – TeleCyP can result in substantial time saving
Provides Cost benefit scenario

Lesion Type and Onsite Cytology

• Onsite Specimen Adequacy is useful for Solid Pancreatic Lesions

• Onsite Specimen Adequacy has limited role in analysis of Pancreatic Cysts
  • Cancer Cytopathol. 2013;121(1):4-8
Take Home Points

• Best Scenario would be to have Pathologists perform specimen adequacy/interpretation

• Best Alternative: Real Time Telecytopathology... Needs further analysis

• Onsite Cytology May not be of value for Cystic Pancreatic Lesions
Pathologists who report cytology should engage in personalized medicine by embracing the idea of FNA with ROSE as a point-of-care test.
Onsite Diagnosis: Can or Should it be done?

Table 2: Concordance rates between preliminary and final cytologic diagnosis

<table>
<thead>
<tr>
<th>Organ Site</th>
<th>Concordance</th>
<th>Upgraded</th>
<th>Downgraded</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pancreas</td>
<td>245 (87.1%)</td>
<td>29 (10.3%)</td>
<td>7 (2.4%)</td>
<td>281</td>
</tr>
<tr>
<td>Lymph Node</td>
<td>77 (95.0%)</td>
<td>3 (3.7%)</td>
<td>1 (1.2%)</td>
<td>81</td>
</tr>
<tr>
<td>Biliary tree</td>
<td>40 (85.1%)</td>
<td>5 (10.6%)</td>
<td>2 (4.2%)</td>
<td>47</td>
</tr>
<tr>
<td>Liver</td>
<td>13 (92.8%)</td>
<td>1 (7.1%)</td>
<td>0 (0%)</td>
<td>14</td>
</tr>
<tr>
<td>GI tract</td>
<td>13 (76.4%)</td>
<td>2 (11.7%)</td>
<td>2 (11.7%)</td>
<td>17</td>
</tr>
<tr>
<td>Adrenal Glands</td>
<td>8 (100%)</td>
<td>0</td>
<td>0 (0%)</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>396 (88.3%)</td>
<td>40 (8.9%)</td>
<td>12 (2.6%)</td>
<td>448</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Preliminary Diagnoses</th>
<th>Benign/ Reactive</th>
<th>Atypical/ Suspicious</th>
<th>Neoplastic/ Malignant</th>
<th>Non - Diagnostic</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pancreas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neoplastic/Malignant</td>
<td>-</td>
<td>2</td>
<td>148</td>
<td>-</td>
<td>150</td>
</tr>
<tr>
<td>Atypical/Suspicious</td>
<td>5</td>
<td>26</td>
<td>17</td>
<td>-</td>
<td>48</td>
</tr>
<tr>
<td>Benign</td>
<td>69</td>
<td>8</td>
<td>2</td>
<td>-</td>
<td>79</td>
</tr>
<tr>
<td>Non-diagnostic</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Deferred/ No Onsite</td>
<td>10</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>41</td>
<td>173</td>
<td>6</td>
<td>305</td>
</tr>
</tbody>
</table>
In the United States, 62 EUS fellows graduate each year and several practice in secondary-size cities and hospitals that do not have access to on-site cytopathology or to cytopathologists trained to interpret EUS specimens. Despite being adequately trained, these novice endosonographers find it difficult to replicate the level of success they had experienced at their training programs. Consequently, their confidence dips, enthusiasm for EUS diminishes, referrals disappear, and practice suffers.

Clin gastro and Hep 2012;10:697–703