Core Needle Biopsy of the Breast
Striving Toward Fewer Excisions

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Topics to be Discussed

• Introduction and background
• Management concerns
• Pitfalls and how to avoid them
• Problems following CNB and displaced epithelium
• CNB reporting and “lesions” easily overlooked

Some CNB Basics

• Core needle biopsies of non-palpable breast lesions began in late 1980s
  - Based on the premise that CNB samples the imaging abnormality and is representative of tissue obtained in an excision specimen
  - Pre-operative diagnosis of cancer
  - Spare patients with benign lesions open surgical biopsy
  - Overcome limitations of FNA
• Now standard of care for initial evaluation of breast lesions
Some CNB Basics

- Variety of radiologic guidance methods
  - Mammography, ultrasound, MRI
- Variety of needle sizes, with and without vacuum assistance
  - 14G needle with spring-loaded device for masses
  - Larger needles (11G-8G) with vacuum assistance for microcalcifications

Comparison of Specimen Sizes

Some CNB Basics

- CNBs are adequate for diagnostic studies (e.g. IHC and FISH) and determining prognostic and predictive factors (i.e. ER/PR and HER2)
- Interobserver agreement on diagnoses rendered on CNB is high, with results comparable to those achieved for excisional biopsy (Collins, Am J Surg Pathol, 2004)
Pathologist Agreement: Local vs Central Dx
Collins, 2004

<table>
<thead>
<tr>
<th>Condition</th>
<th>CNB (n=2002)</th>
<th>Open (n=546)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>96%</td>
<td>93%</td>
<td>0.008</td>
</tr>
<tr>
<td>Benign</td>
<td>99%</td>
<td>96%</td>
<td>ns</td>
</tr>
<tr>
<td>Invasive</td>
<td>97%</td>
<td>98%</td>
<td>ns</td>
</tr>
<tr>
<td>DCIS</td>
<td>84%</td>
<td>92%</td>
<td>ns</td>
</tr>
<tr>
<td>ADH</td>
<td>64%</td>
<td>58%</td>
<td>ns</td>
</tr>
<tr>
<td>ALH/LCIS</td>
<td>56%</td>
<td>67%</td>
<td>ns</td>
</tr>
</tbody>
</table>

Some CNB Basics

- Knowing clinical history and imaging findings, including radiologist’s differential diagnosis, is essential
- CNB for microcalcifications
  - Specimen radiograph
  - Cores with and without calcifications should be submitted separately
  - Very helpful to have specimen radiograph submitted with specimen (or to have access to it)
  - Calcifications seen on slide must correlate with those seen on radiograph
The Missing Calcifications

- Additional levels
- Radiograph blocks
- Look for holes/tears in tissue
- Calcium oxalate?
The pathologic diagnosis on a core biopsy must be concordant with the impression from imaging studies.
Discordant diagnoses must be reconciled; may require repeat core biopsies or surgical excision.
Radiology-pathology correlation conferences.
Communication: The Essential Component of Any Core Needle Biopsy Program

Examples of Discordance

<table>
<thead>
<tr>
<th>Imaging</th>
<th>Pathology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spiculated mass</td>
<td>Any benign diagnosis (?except radial scar)</td>
</tr>
<tr>
<td>Circumscribed mass</td>
<td>Benign, non-specific diagnosis</td>
</tr>
<tr>
<td>“Malignant” calcs</td>
<td>Any benign diagnosis, even if calcs present</td>
</tr>
</tbody>
</table>

Radiographic-Pathologic Correlation

- Some cases are nebulous with regard to concordance
  - Non-mass-like enhancement on MRI
    - Pathologic correlates?
  - Vague mass/developing density on imaging
    - Variably fibrotic breast tissue on CNB with no discrete mass-forming lesion
    - PASH on CNB
      - Found in ~25% of all benign breast biopsies
Diagnostic Problems

- Similar to those encountered in excisional biopsies
  - ADH vs. low grade DCIS
  - Identifying foci of invasion in association with DCIS
  - DCIS vs. LCIS
  - Tubular carcinoma/low grade invasive ductal carcinoma vs. benign sclerosing lesions
  - Papillary lesions
  - Spindle cell lesions
  - Columnar cell lesions (FEA vs. not)
  - Mucocle-like lesion vs. mucinous carcinoma
  - Fibroepithelial lesions
  - Vascular lesions

Management Problems

- Some diagnoses on CNB may be upgraded to a worse diagnosis at excision
  - DCIS
  - ADH
  - Lobular neoplasia
  - Papilloma
  - Radial Scars
  - FEA
  - Fibroepithelial lesions

Management Problems

- The opportunity to detect and diagnose non-malignant breast lesions has changed dramatically over the last few decades, leading to uncertainty as to optimal management
Management Problems

• Literature consists of small, single institution, retrospective studies, many lacking clear criteria for excision vs. follow up, and often with selection bias and very short lengths of f/u
• Lack of clear rad-path correlation, with many upgraded cases having imaging features that warranted excision
• Criteria for ADH established on open biopsies, not the limited material afforded by CNB
• Upgrade rates variably defined
• Definition of “high-risk lesion” varies by discipline

ADH on CNB

Conventional Wisdom

ADH on CNB requires surgical excision to exclude carcinoma (DCIS + invasion)

Upgrade to Worse Lesion on Excision Related to

• Technical factors:
  – Gauge of needle
  – Lesion targeted (calcs vs. mass)
  – Completeness of removal
• Pathologic factors:
  – Extent of ADH on core
  – Histologic features of ADH
Attempts at Stratification

- Extent of ADH on CNB
  - # of foci of ADH
- Features of ADH on CNB
  - Micropapillary pattern
  - "Marked" ADH
  - Cytologic features bordering on DCIS
- Features of microcalcifications
  - Linear, branching vs. fine, rounded calcifications

Ely, 2001; Sneige, 2003; Dalton, 2003; Ely, 2008; Hoang, 2008; Wagoner, 2009; VandenBussche, 2013

ADH Diagnosed on CNB
Studies with Radiologic-Pathologic Correlation

<table>
<thead>
<tr>
<th>Atypical ductal hyperplasia on core biopsy with upgrade to carcinoma on excision</th>
<th>Core Biopsies</th>
<th>Excisions</th>
<th>Carcinoma (%)</th>
<th>DCIS</th>
<th>IMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wagoner 2009</td>
<td>123</td>
<td>123</td>
<td>22 (18%)</td>
<td>22 (18%)</td>
<td>0</td>
</tr>
<tr>
<td>Kohr 2010</td>
<td>101</td>
<td>101</td>
<td>20 (20%)</td>
<td>17 (17%)</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>McGhan 2012</td>
<td>114</td>
<td>114</td>
<td>20 (18%)</td>
<td>15 (13%)</td>
<td>5 (5%)</td>
</tr>
<tr>
<td>Khoury 2014</td>
<td>203</td>
<td>203</td>
<td>57 (28%)</td>
<td>47 (23%)</td>
<td>10 (5%)</td>
</tr>
<tr>
<td>Menes 2014</td>
<td>685</td>
<td>685</td>
<td>123 (18%)</td>
<td>101 (15%)</td>
<td>22 (3%)</td>
</tr>
<tr>
<td>Total</td>
<td>1226</td>
<td>1226</td>
<td>242 (20%)</td>
<td>202 (17%)</td>
<td>40 (3%)</td>
</tr>
</tbody>
</table>

Long-Term Safety of Observation in Selected Women Following Core Biopsy Diagnosis of Atypical Ductal Hyperplasia

Inclusion Criteria:
- Removal >50% of calcs
- No mass
- <3 foci of ADH
- No necrosis

Median f/u 3 yrs

Only personal history of breast cancer was associated with subsequent breast cancer events (HR=12.5; 95%CI 3.3-47.6)
Ann Surg Onc, Menen, 2017
Attempts at Stratification

- We are getting closer to identifying a subset of patients with ADH on CNB who can safely be spared excision
  - Larger gauge needles
  - Multiple cores
  - No residual calcifications
  - Limited ADH on histology

Our current practice:
Excision for patients with ADH on CNB

Lobular Neoplasia on CNB
Longstanding Practice

- LN on CNB requires surgical excision to exclude a worse lesion (DCIS + invasion)
- Upgrade rates reported range from 0-33%
- But classical LCIS/ALH is usually an incidental finding with no associated imaging target....
Lobular Neoplasia on CNB

- More contemporary studies with careful radiologic-pathologic correlation demonstrate very low upgrade rates when classical LN is determined to be incidental

<p>| ALH and LCIS on core biopsy and excision with radiologic-pathologic concordance |</p>
<table>
<thead>
<tr>
<th>Core Biopsies</th>
<th>Excisions</th>
<th>Carcinoma (%)</th>
<th>DCIS</th>
<th>IMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neel 2012</td>
<td>69</td>
<td>69 / 5 (8%)</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Randi 2012</td>
<td>76</td>
<td>69 / 3 (4%)</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Zhao 2012</td>
<td>163</td>
<td>163 / 5 (3.1%)</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Shah-Rihani 2012</td>
<td>101</td>
<td>101 / 2 (2%)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Zhao 2012</td>
<td>74</td>
<td>74 / 6 (8%)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Mikes 2013</td>
<td>59</td>
<td>59 / 2 (4%)</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Murray 2013</td>
<td>72</td>
<td>72 / 2 (3%)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>D’Alfonso 2013</td>
<td>61</td>
<td>61 / 6 (10%)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Nakhlis 2015</td>
<td>74</td>
<td>74 / 1 (1%)</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Sen 2016*</td>
<td>436</td>
<td>436 / 11 (2.5%)</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>1,167</td>
<td>1,169 / 43 (3.7%)</td>
<td>28</td>
<td>16</td>
</tr>
</tbody>
</table>

Lobular Neoplasia on CNB

Current Practice

- Truly incidental classical LCIS or ALH do not require surgical excision
- Upgrades usually small, low grade invasive carcinomas (?incidental)
- Insufficient data on non-classical (variant) forms of LCIS, which are more often the imaging target due to their association with microcalcifications-excision is warranted
- Do not diagnose these cases as LN NOS!
Papilloma on CNB
Issues of Concern

- Distinction among benign, atypical and malignant papillary lesions difficult, especially with limited material
- Sampling issues: otherwise benign papillomas may harbor foci of ADH or DCIS

Evaluation of Problematic Papillary Lesions

- Histologic features
- Adjunctive immunostains
  - Myoepithelial cell markers
  - CK 5/6
  - ER

Table 1: Diagnostic criteria of papillary lesions

<table>
<thead>
<tr>
<th>Category</th>
<th>Pathologic diagnosis</th>
<th>Mitotic activity</th>
<th>myoepithelial cell layers and/or areas of DIFP</th>
<th>ER expression in areas of DIFP</th>
<th>Proportion of CK5/6 negative DIFP in solid lesion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benign papillomas</td>
<td>Pseudopapillomatous</td>
<td>&lt; 5/mm²</td>
<td>In papillary core or involved ductules</td>
<td>Not diffused staining</td>
<td>Not diffused staining</td>
</tr>
<tr>
<td>Benign papillomas</td>
<td>Papillomas with ADH</td>
<td>&lt; 5/mm²</td>
<td>In papillary core or involved ductules</td>
<td>Not diffused staining</td>
<td>Not diffused staining</td>
</tr>
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<td>Benign papillomas</td>
<td>Papillomas with DCIS</td>
<td>&lt; 5/mm²</td>
<td>In papillary core or involved ductules</td>
<td>Not diffused staining</td>
<td>Not diffused staining</td>
</tr>
<tr>
<td>Malignant papillomas</td>
<td>Papillary carcinoma</td>
<td>&gt; 5/mm²</td>
<td>Interdigitating myoepithelial cells</td>
<td>Loss of expression</td>
<td>Loss of expression</td>
</tr>
<tr>
<td>Malignant papillomas</td>
<td>Papillary carcinoma</td>
<td>&gt; 5/mm²</td>
<td>Interdigitating myoepithelial cells</td>
<td>Loss of expression</td>
<td>Loss of expression</td>
</tr>
<tr>
<td>Malignant papillomas</td>
<td>Carcinomas</td>
<td>&gt; 5/mm²</td>
<td>Interdigitating myoepithelial cells</td>
<td>Loss of expression</td>
<td>Loss of expression</td>
</tr>
</tbody>
</table>

Br Cancer Res Treat, 2013
Benign Papilloma on CNB with Excision

<table>
<thead>
<tr>
<th>Study</th>
<th>Cases</th>
<th>Excision Carcinoma (%)</th>
<th>Upgraded (%)</th>
<th>Specimen Fragmentation (%)</th>
<th>Predominantly Small Carcinomas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaffer, 2009</td>
<td>150</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bennett, 2010</td>
<td>120</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Chang, 2010</td>
<td>100</td>
<td>10</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Jung, 2010</td>
<td>160</td>
<td>10</td>
<td>6%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Cyr, 2011</td>
<td>193</td>
<td>8</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Kim, 2011</td>
<td>211</td>
<td>12</td>
<td>9%</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Richter-Ehrenstein, 2011</td>
<td>45</td>
<td>2</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Youk, 2011</td>
<td>160</td>
<td>8</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Fu, 2012</td>
<td>203</td>
<td>12</td>
<td>6%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Holley, 2012</td>
<td>128</td>
<td>14</td>
<td>16%</td>
<td>NR</td>
<td>NR</td>
</tr>
<tr>
<td>Li, 2012</td>
<td>370</td>
<td>7</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Rizzo, 2012</td>
<td>234</td>
<td>21</td>
<td>9%</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Jaffer, 2013</td>
<td>114</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Nayak, 2013</td>
<td>80</td>
<td>3</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>Swapp, 2013</td>
<td>224</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Pareja, 2016</td>
<td>196</td>
<td>4</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Total: 2542, 1946, 110

Incidental Upgrade

- Concurrent ipsilateral carcinoma
- Specimen fragmentation (100% of upgraded cases vs. 46% of non-upgraded cases)
- Predominantly small, incidental carcinomas found at excision
**Microscopic Incidental Papillomas on CNB**

- **Jaffer, Breast J 2013**
  - 14 excisions for incidental papilloma
  - No upgrades
- **Lee, AJR 2012**
  - 17 microscopic papillomas
  - Could not determine if incidental or associated with imaging target
  - No upgrades
- **BIDMC experience**
  - 10% of papillomas (12/121) on CNB were incidental findings
  - 50% underwent excision; no upgrades

---

**Our Current Practice**

<table>
<thead>
<tr>
<th>Excision for</th>
<th>No Excision for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Targeted Papillomas</td>
<td>Incidental Papillomas</td>
</tr>
</tbody>
</table>

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**Fibroepithelial Lesions on CNB**

- Diagnosis of fibroadenoma on CNB usually straightforward
- If it looks like a fibroadenoma, call it a fibroadenoma
- Excision not required
Fibroepithelial Lesions with Increased Stromal Cellularity
Cellular FA vs. Phyllodes Tumor

• How cellular is too cellular?
• Features favoring phyllodes tumor:
  – Fragmentation
  – Epithelium along edges of fragments
  – Imbalance between glands and stroma
  – Mitoses
• Excision required
• Not essential make decision on CNB
Fibroepithelial Lesions on CNB

• An apparently pure spindle cell lesion on CNB may still be a phyllodes tumor
• Don't exclude the possibility of phyllodes tumor even if no epithelial component is seen
Flat Epithelial Atypia

FEA on core biopsy
- “Upgraded” in 0-30% of cases
- But need for excision remains uncertain
- Rad-path correlation required

Can Mucocele-Like Lesions Be Reliably Diagnosed on CNB?

- Reported upgrade rates to DCIS or invasive cancer range from 0 to 30%
- Small numbers
- Not all patients underwent excision
- Includes cases of mucocele-like lesions with and without atypia/ADH
What About Mucocele-Like Lesions Without Atypia on CNB?

- 156 cases reported in 14 studies
  - Studies ranged in size from 3-54 pts
  - 6 upgrades (3.8%)
    - 3 DCIS
    - 3 invasive carcinoma

Rakha, et al, 2013

Mucinous Lesions on Core Needle Biopsy (that are not obviously mucinous ca or DCIS with mucin production)

- Excision required if there is
  - pathologic-radiologic discordance
  - epithelial atypia/ADH
- Excision may not be required if the findings are unequivocally those of a mucocele-like lesion without atypia/ADH and if radiologic and pathologic findings are concordant
- Multiple levels to R/O mucinous carcinoma
SUMMARY

Upgrade rate (%): CNB to excision

<table>
<thead>
<tr>
<th>Lesion</th>
<th>Upgrade Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atypical ductal hyperplasia</td>
<td>20–30</td>
</tr>
<tr>
<td>Atypical lobular hyperplasia</td>
<td>0–10</td>
</tr>
<tr>
<td>Lobular carcinoma in situ</td>
<td>0–10</td>
</tr>
<tr>
<td>Other problematic lesions</td>
<td></td>
</tr>
<tr>
<td>Flat epithelial atypia</td>
<td>0–10</td>
</tr>
<tr>
<td>Papilloma</td>
<td>0–10</td>
</tr>
<tr>
<td>Radial scar</td>
<td>0–10</td>
</tr>
<tr>
<td>Mucocoele-like lesion</td>
<td>0–30*</td>
</tr>
</tbody>
</table>

*(includes cases with atypia)*
How to Avoid Getting Yourself Into Trouble

• Be aware of the imaging findings and the radiologist’s differential diagnosis
• Liberal use of levels
•Judicious use of immunostains
• Be conservative; avoid overdiagnosis when findings are equivocal
  – esp with regard to ADH vs. DCIS, DCIS vs. DCIS with microinvasion, in situ vs. invasive lesion

How to Avoid Getting Yourself Into Trouble

• Questions you should ask yourself:
  – It looks like an epithelial malignancy but is it really a carcinoma?
  – It’s definitely carcinoma but is it really a breast primary?
  – Is this even a breast lesion?
Epithelioid Angiosarcoma

Keratin
CD31
Factor VIII
How to Avoid Getting Yourself Into Trouble

• Questions you should ask yourself:
  – It looks like an epithelial malignancy but is it really a carcinoma?
  – It’s definitely carcinoma but is it really a breast primary?
  – Is this even a breast lesion?
Metastatic papillary carcinoma of ovarian origin

Metastatic carcinoid of colonic origin
Extramammary Malignancies Metastatic to the Breast

• When to start thinking about a metastasis:
  – Histology unusual for breast primary
  – Absence of in situ component
  – Extensive LVI with little or no stromal invasion
  – Triple negative

How to Avoid Getting Yourself Into Trouble

• Questions you should ask yourself:
  – It looks like an epithelial malignancy but is it really a carcinoma?
  – It’s definitely carcinoma but is it really a breast primary?
  – Is this even a breast lesion?
Angiolipoma in subcutaneous adipose tissue

Problems in Surgical Specimens Following CNB

- The missing cancer
- Measurement of tumor size
- Epithelial displacement
Problems in Surgical Specimens Following CNB

- The missing cancer
- Measurement of tumor size
- Epithelial displacement

The Missing Cancer

- Invasive cancer or DCIS in core; no corresponding lesion
- Relatively uncommon, but does happen

The Missing Cancer

- Patient misidentification
- False positive CNB
- Biopsy site not excised (even if clip is localized)
  - Clip migration
  - Be sure to look for biopsy site changes
The Missing Cancer

- Inadequate sampling of surgical specimen
- Lesion entirely removed by CNB
- Obliteration of residual cancer by healing process
- Post-neoadjuvant therapy (with no history provided)
  - Look at date of prior CNB

Problems in Surgical Specimens Following CNB

- The missing cancer
- Measurement of tumor size
- Epithelial displacement

Measurement of Tumor Size

- May be difficult due to associated biopsy site changes disrupting or fragmenting tumor
Measurement of Tumor Size

- Review prior core needle biopsy to determine largest size
- Review size on imaging studies (especially ultrasound)
- “The tumor measures 7mm but a portion of this measurement includes biopsy site changes”

Problems in Surgical Specimens Following CNB

- The missing cancer
- Measurement of tumor size
- Epithelial displacement

Epithelial Displacement

- Benign
- DCIS
- Invasive
- Stroma
- Vascular spaces
- Lymph nodes
Epithelial Displacement

• Frequency inversely related to CNB interval

• More common with papillary lesions

Diaz, 1999; Nagi, 2005; Phelan, 2007
To Avoid Overdiagnosis of Stromal Invasion

- Look for invasion away from biopsy site
- Look for recognized type/pattern of invasive cancer
- Myoepithelial cell markers only helpful if positive
To Avoid Overdiagnosis of Vascular Space Invasion

• Be extremely conservative if there is only DCIS or a benign lesion

• In cases of invasive carcinoma, look for vascular involvement away from biopsy site

Displaced Epithelium in Axillary Lymph Nodes

• Epithelial cells may reach ALN through benign mechanical transport

• Associated hemosiderin-laden macrophages and damaged RBCs favor mechanical displacement (Carter, Am J Clin Pathol 2000)
Displaced Epithelium vs. ITC
Does it Really Matter?

• NSABP B-32 trial (Weaver, 2011)
  – Micromets and ITC associated with very small decrease in survival
    • Statistically significant, but not clinically meaningful
• ACOSOG Z0010 trial (Cote, 2010)
  – SLN mets detected by IHC not significantly associated with reduced survival

Contents of the CNB Report

• The correct diagnosis, of course
• Biopsies for calcifications
  – Location of calcifications
  – Do the calcifications you see microscopically account for the calcifications seen on mammogram and specimen radiograph?

Contents of the CNB Report

• Biopsies for masses with benign histology on CNB
  – Do the histologic findings account for a mass lesion? If not:
    • “Diagnostic features of a mass-forming lesion are not seen; clinical and radiologic correlation are advised.”
  – Be on the lookout for clusters of apocrine cysts, cyst wall, tumor-forming PASH, lymphocytic (diabetic) mastopathy
Apocrine cysts

Cyst wall

Lymphocytic mastopathy

Lymphocytic mastopathy
Contents of the CNB Report

• Biopsies with invasive cancer
  – Histologic type, histologic grade, maximum size
  – ER, PR, HER2
    • Sometimes one or more needs to be repeated on surgical specimen:
      – Repeat ER, PR, HER2 if tumor on core is triple negative, s/p neoadjuvant therapy, insufficient for accurate assessment, or results on core are unexpected (e.g., ER-negative ILC or tubular ca)
      – Repeat HER2 if HER2 negative on core and tumor is grade 3
      – Repeat HER2 if HER2 equivocal on core

What Not to Say in CNB Reports

• “Multifocal” anything!
  – “Multifocal” invasive cancer
  – “Multifocal” DCIS
  – “Multifocal” LCIS
• More than you really need to say to get the patient to the appropriate next step