Where Small Biopsies Go Wrong...... Breast FNA & Breast Core Biopsies: Challenges & Opportunities

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Objectives

- To discuss role of FNA vs. Core biopsy for evaluation of breast lesions in 2009.
- To evaluate areas of risk in breast diagnosis from a cytologic/histologic perspective
- To discuss challenges in breast diagnosis: cytologic and histologic perspective
What is the role of Breast FNA in 2009?
Breast FNA in 2009

- Use of breast FNA decreasing with widespread utilization of Core Biopsy
- Cleveland Clinic Cytopathology:

<table>
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<tr>
<th>Year</th>
<th>Breast FNA</th>
<th>Total Non-gyn</th>
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<tr>
<td>1998</td>
<td>2,559(30%)</td>
<td>8,444</td>
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<td>2008</td>
<td>414(3.5%)</td>
<td>11,637</td>
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Advantages of CNB over FNA

- Improved sensitivity and specificity
- Ease of stereotactic localization
- Identification of microcalcifications (radiographically in biopsy and on slide)
- Ability to reproducibly perform marker studies such as ER/PR and Her2 on core.
1999-2003 - all screen detected breast cancer

763 patients with FNA and CB
- 231 - microcalcifications
- 532 - soft tissue lesion

Sensitivity: 80% CB, 65% FNA; combined 87%

Inadequate biopsies: 5% CB and 8% FNA

Conclusions: UK Study

- FNA: rapid & inexpensive, less invasive, easier/safer in certain lesions, immediate reporting
- CB: more reliable in invasion vs. in situ lesions, decreased inadequate rate, ability to do prognostic markers reliably
- Advantage in combining FNA & CB - best sensitivity
- But……….. CB test of choice
Utilization of FNA

- Varies with institution
- Even though CB is procedure of choice; FNA will be used in certain clinical situations: for example- chest wall proximity, cysts, and other
- Important to be familiar with areas of difficulty & risk for both FNA & CNB...they are more alike than you think
What goes wrong in small biopsies? ....... Medical Legal Risk in Small Biopsy diagnosis of Breast Lesions.
Errors in Cytology/Pathology

- Many ways to define
  - Clinically significant vs. academic
  - Cognitive vs operational
  - Prospective vs retrospective review
  - “Expert” second opinion, intradepartmental review or interinstitutional
Errors in Cytology/Pathology

- As defined by legal system - error as injury resulting from negligence
- Negligence defined by expert testimony as medical practice that falls below standard of care
- Standard of care - professional behavior expected of prudent, careful & informed physician
Medical Legal Risks: Doctors Company

- 1995-1997:
  - 218 pathology claims – 22% related to Breast Diagnosis
  - Breast FNA – 6% of claims
  - Breast Biopsy – 14%
  - Breast Frozen section – 2%

http://www.thedoctors.com/KnowledgeCenter/Patient Safety
Medical Legal Risks: Doctors Company

- 1998-2003: Breast specimens- 15.5% of all malpractice claims
- 42 claims related to breast biopsies
  - 79% - excisional biopsies
  - 21% - needle core biopsies
  - Decrease in FNA claims (?)related to decrease use of FNA?)
  - Evenly divided between false positive and negative
In 1995-1997 – majority of breast FNA claims were false negative (sampling error – palpable mass with a negative or benign FNA diagnosis)

False positive FNA claims: interpretative, FNA diagnosis of carcinoma made on a Fibroadenoma
Triple Test Strategy

- Equally important for FNA & CNB
- Correlation:
  - Cytology/pathology results
  - Radiologic findings:
    - mammogram/ultrasound/MRI
  - Clinical breast examination
The Triple Test

Radiology

FNA/ Clinical

Cytologic Diagnosis
Diagnostic Error: FNA

- False negative – sampling; negative or benign diagnosis

- False positive – diagnosis of FA as Cancer
  - Triple test – discordance – round mobile lesion vs. spiculated lesion
Diagnostic Errors: Core Needle Biopsy

- Misdiagnosis: DCIS, Sclerosing adenosis & florid adenosis as invasive cancer
- Misdiagnosis: LCIS vs. solid low grade DCIS ---- different patient management
- Failure to recognize small, easily overlooked foci of invasive lobular carcinoma
Key Points: Breast Biopsy

- Keep patient management in mind: DCIS, LCIS, ADH
- Atypia – further biopsy is necessary
- In DCIS, LCIS, ADH diagnosis – specifically state “no invasive carcinoma”
Diagnostic Challenges In FNA & CNB
Diagnostic Challenges

FNA:
- Fibroadenoma

FNA & CORE BI OPSY:
- Papillary Lesions
- Mucinous Lesions

CORE BI OPSY:
- DCIS vs LCIS
- Sclerosing Lesions
Case #1

- 45 year old woman present with a palpable mass. An FNA is performed and the aspirate is sent to cytology with the clinical history of:

“RULE OUT CANCER”
FNA Cytology
False-Positives: Fibroadenoma
False Negatives: Tubular carcinoma

Resembles Fibroadenoma on low power
Mammogram: Fibroadenoma vs. Carcinoma
Fibroadenoma

- Cytologic Triad: stroma, staghorn epithelial clusters and “naked”, bipolar cells in background
- Increased cellularity and discohesiveness lead to false positive diagnoses
- Triple Test Strategy – prevent this mistake
Case #2

- 68 year old woman presents with the radiographic finding of a lobulated mass. The FNA interpretation is: suspicious for malignancy. A Core biopsy is done
Papillary Lesions

- **Cytology**: Cellular specimens with discohesion, may identify fibrovascular cores, apocrine met favors benign

- Benign intraductal papilloma to papilloma with atypia to intracystic papillary carcinoma ---- overlap in cytologic and histologic findings
Intraductal Papilloma

Mammogram

Gross

FNA
Intracystic Papillary Carcinoma
Intracystic Papillary Carcinoma
Papillary Neoplasms

- FNA: "Papillary Neoplasm" – favor benign vs. malignant
- Core Biopsy: Intraductal papilloma, papilloma with atypia, or papillary neoplasm cannot rule out carcinoma
- Most are completely excised
Case #3: 75 year old woman with a circumscribed breast mass
Case #3
Core Biopsy
Mucinous Lesions

- **Hallmark** – Background mucin
- **Overlap** between mucocele and mucinous carcinoma in both Core & FNA
- **FNA Mucinous carcinoma**: Cellular, discohesive, eccentrically located nuclei and abundant cytoplasm, usually low grade
- Hypocellular Lesions (FNA & Core): Require excision for a definitive diagnosis
Mucinous “Colloid” Carcinoma
CHALLENGES IN CORE BIOPSY
Solid Low Grade DCIS vs. LCIS

- Uniform population of cells expanding duct
- Patient management issue
- E-cadherin – Caution in categorizing based on one immunohistochemical stain
- Mixed carcinoma in situ – ductal/lobular
ECADHERIN positive– SOLID TYPE DCIS
Lobular neoplasia

E-cadherin
Spiculated Lesions:
Radial Scar vs Invasive Carcinoma
Tubular Carcinoma

Angulated Epithelial Clusters
Spiculated Lesion: Tubular Carcinoma
Benign Sclerosing lesion
What about the Opportunities?

- **FNA** - continued role but limited for diagnosis, future---prognostic, molecular markers that can be done on limited samples of primary lesions & metastasis

- **CB** - Application of markers for diagnosis, therapeutic management and risk assessment
Conclusions

- The CB is the procedure of choice in most institutions for breast diagnosis for a variety of reasons.
- FNA stills plays a role in breast cancer diagnosis--- important to maintain skills in performance and interpretation.
- Analysis of medical legal issues can aid to preventing mistakes in breast cancer diagnosis.
Conclusion

- REMEMBER THE TRIPLE TEST!!!