Fine Needle Aspiration Cytology of Breast: Correlation with Needle Core Biopsy

Case #1
64-year-old woman
Mass in breast

Post-Radiation Angiosarcoma
CD31
Ki67
Post-Radiation Angiosarcoma

- Age: 50
- Interval: 6 years (r: 3-12)
- Target: Skin, Breast, Both
- Grade: Any
- Risk of AS: 0.1%, 1 in 1000

Clinical history is key

Case #2

41-year-old
Calcifications
Mammary Amyloid Tumor

Rare Mass Mammographic abnormality Older women
Associations: Myeloma, Rheumatoid Arthritis

Cytology can be difficult

APMIS. 2008;116:846-9

Case #3

37-year-old “Lumpiness”

Mammo: dense, no discrete mass
Ultrasound: Irregular hypoechoic shadowing

Pap
Diabetic Mastopathy

- **Tumoral Mass**
- May be multiple, bilateral
- Fibrosis, Lymphocytes
- Insulin-dependent diabetics
- Age: <30, 20 years after onset


Cytology can be very difficult

Inadequate Rate for non-palpable non-calcific lesions: ~50%

Review of literature thru 2014
Case #4

34-year-old pregnant woman
Painful lump in left breast

Excisional biopsy

Infarcted tumor
? Lactational Adenoma
Lactational adenoma

Fat necrosis

Infarcted papilloma, usually benign

Typical Triple-Negative Carcinoma

Histology

Gross

Necrosis in cytology can be benign or malignant
47-year-old woman
Mass in left breast

Case #5
Apocrine Metaplasia

Histiocytes

Granular Cell Tumor

S100p+

Simulates carcinoma: radiographically, clinically & grossly

Characteristic granular cytology
S100p positive

Mammary Granular Cell Tumor


Cytology can be better than Surgical Biopsy

Case #6

55-year-old ill-defined mass in right breast
Lobular Carcinoma
Diagnostic Pitfalls

- Few cells
- Small cells
- Clinical findings subtle
- Radiology findings subtle
- False-negative rate: 28%

Always remember Invasive lobular carcinoma

Case #7

54-year-old Mass

Smear

Always remember Invasive lobular carcinoma

DQ

Pap
Mammary Plasmacytoma

Rare lesion
Mass

Remember non-breast diseases

Case #8
48-year-old woman
Mass in breast & axilla

Pap

DQ

NCB

p63

DQ

Pap

p63
Primary Mammary B-Cell Lymphoma

- Less than 1% of primary breast tumors
- Usually B-cell
- Diffuse Large B-Cell, Follicular, MALToma
- May simulate carcinoma
- Axillary nodes involved in ~50%

Immunostains can mislead, in aspiration cytology & core biopsy


Case #10

19-year-old
2 cm mass

Cytology of Fibroadenoma

- Hypercellular
- Sheets of cells in clusters
- “Naked” cells in background
Problems in Fibroadenoma

- No clusters
- Minimal stroma
- Pleomorphism
- #1 cause of false-positive

Cytology of Fibroadenoma Challenges

- No clusters
- Minimal stroma
- Pleomorphism

Features of Malignancy

- Hypercellular
- One-cell population
- Single Cells
- Atypia

Case #11

63-year-old Calcifications on first mammogram
Aspiration cytology is not appropriate for calcifications

Inadequate Rate for non-palpable calcific lesions: ~30%

Review of literature thru 2010

Disadvantages of FNA of Cytology

- Higher non-diagnostic rate
- Lower negative-predictive value
- ? proliferative lesions
- ? in situ vs invasive ca
- ? ancillary studies

Chen et al. Schistosoma by Cytology. Diagn Cytopathol 2007;35:722

Schistosomiasis
Advantages of FNA of Breast

- Minimally invasive
- Low morbidity
- Immediate assessment
- Sampling of multiple lesions
- Lower cost

Reliability of Aspiration Cytology of Breast

- Sensitivity: 65-98%, ~90%
- Specificity: 34-100%, ~99%
- False-positive: 0.5-2%
- False-negative: 3-5%
- False-suspicious: 1-13%

Review of Literature thru 2014

False-Positives in Breast Cytology

- Causes:
  - Sampling, Interpretation, Both
- Prevention:
  - Apply “Triple-Test”
  - Experience
  - Technique

“Triple Test” Clinical, Radiology & Cytology Match in Breast Cytology

If “Triple Test” passed...

- Correct diagnosis of 97% of carcinoma
- Correct diagnosis of 100% of benign

Review of Literature thru 2014

Litigation Claims on Breast Diagnoses

- Breast-related: 22% of all
- Breast Cytology: 06%
- False-positive = False-negative
- Most common false+: Fibroadenoma

Troxel et al. Archiv Pathol Lab Med 2006;130:617

Adequacy Criteria in Breast Cytology

- Quantitative Criteria:
  - cells, cell type, slides, passes.
  - 6 clusters, x5-10 cells in each
- Qualitative Criteria:
  - clinical, radiological, cytological
  - Solid lesions: ? Criteria
  - Cystic lesions: Persistent Cyst> Repeat
Indications for Fine Needle Aspiration in Breast

- Mass, core biopsy not available
- Cyst aspiration
- Recurrent tumor
- Axillary mass

Newer Indications for Aspiration Cytology in Breast

- Assess chemotherapy response
- Assess lymph node involvement
- Screen BRCA patients
- Implant-associated effusion, lymphoma

Test

Carcinoma

Q1

Q2

Apocrine Metaplasia

Q3

Carcinoma
Q4
Fibroadenoma

Q5
Carcinoma