Lumps, Bumps, Leaking and Pain
Management of Breast Conditions

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I HAVE NO DISCLOSURES
Plan

- Palpable breast mass
- Non-Palpable breast mass
- Mastalgia
- Nipple Discharge
- Mastitis

Gallup Poll: Leading Causes of Death in Women

Perceived

- Breast CA 38%
- Heart Dz 18%
- Lung Ca 2%
- Other Ca 13%
- Lung Dz's 1%
- Stress 2%
- Other 17%

Actual

- Breast CA 5%
- Heart Dz 36%
- Lung Ca 6%
- Other Ca 13%
- Lung Dz's 9%
- Other Ca 29%
- Ovarian Ca 2%
- Other 29%
Failure to diagnose breast cancer in a timely manner is a leading cause of malpractice claims.

Common reasons:
- Unimpressive physical findings
- Failure to f/u with pt
- Palpable mass with negative mammogram

Likelihood of Cancer in Dominant Breast Mass by Age

Of all discrete breast masses, about 10% are cancerous (In contrast, 8% of abnormal mammos = cancer)
“Dominant Mass”?

- **Discrete or dominant mass** = stands out from adjoining breast tissue, definable borders, is measurable, not bilateral.

- **Nodularity or thickening** = ill-defined, often bilateral, fluctuates with menstrual cycle

- In women <40 referred for mass, only 1/3 had confirmed dominant mass

Breast Mass: Diagnostic Options

- Physical exam
- Ultrasound
- Mammogram
- Cyst aspiration
- Fine needle aspiration
- Core needle biopsy
- Excisional biopsy
Question 1

A 42 yr old woman with no family or personal history of breast cancer has found a breast lump. She doesn’t know how long it has been there. It is not painful.
On exam, it is a discrete mass, 2 cm, relatively smooth, mobile and non-tender. She has no axillary lymphadenopathy.

What is your next step?

Q1: Palpable mass in 42 yo

Next step (pick one)?
A. Nothing now. Re-examine in 1-2 months
B. Ultrasound
C. Mammography
D. Office aspiration
E. FNAB
F. Core biopsy
Q1b: Palpable mass in 42 yo

A mammography was chosen and is negative. Next step (pick one)?

A. Re-examine in 1-2 months
B. F/u 1 year for annual exam
C. Ultrasound
D. Office aspiration
E. FNAB
F. Core biopsy

Q1c: Palpable mass in 42 yo

An ultrasound was chosen as the first step. It shows a cystic mass. Next step?

A. Re-examine in 1-2 months
B. F/u 1 year for annual exam
C. Office aspiration
D. FNA
E. Core biopsy
**Step 1: Palpable Breast Mass**

- **Determine if mass is cystic or solid**
  - Simple cysts are benign and don’t require further evaluation
  - 20-25% of palpable masses are simple cysts, most occurring in 40-49 yo’s
  - **Options?:** Ultrasound, office aspiration, FNA, core needle biopsy

**Breast Exam**

- *Neither* sensitive (50-60%) nor specific (60-90%) (even when done by experts)
- Cannot reliably distinguish cyst from solid
- Nonetheless, it is important for determining if mass is discrete (vs nodularity or thickening), is a necessary adjunct to mammogram and is required for follow-up of masses
- Perform in 2 positions, methodical, spirals or strips
- Mark mass prior to biopsy so others can find it
Ultrasound

- **Primary Use:** Classify mass as cystic or solid
- Guidance for cyst aspiration or biopsy
- Adjunct to evaluate symmetric densities detected by mammography
- Can be the first test performed & if cyst is confirmed—the only test required

Fibroadenoma

- Well-circumscribed, superficial

Cancer

- Irregular, deep

Cyst

- Anechoic, well-circumscribed,

Ultrasound is 98-100% accurate for diagnosis of simple cysts. However, for solid masses, it cannot reliably distinguish benign from malignant.
Cyst Aspiration

- **Simple office procedure:** 20-23 gauge needle and syringe, ultrasound guidance optional, specialized training not necessary
- **Primary Use:** Confirm mass is cystic
- **Secondary use:** Relieve pain/pressure due to symptomatic cyst
- **Benefits:** If cystic fluid obtained, establishes immediate diagnosis and provides symptomatic relief

1. Obtain oral consent from patient.
2. Clean area over the lump with an alcohol swab.
3. Immobilize the lump between the index and middle fingers of your nondominant hand.
4. Use a 23-gauge 1-in disposable needle with a semiopaque needle hub attached to a 3-mL or 5-mL syringe.
5. Introduce a small amount of air into the syringe barrel to break the seal.
6. Hold the syringe with your dominant hand, as you would a pen, and insert the needle into the centre of the lump (A).
7. Use the fingers of your nondominant hand to stabilize the distal aspect of the syringe while walking the fingers of your dominant hand up the syringe to pull back on the plunger to aspirate (B).

*Figure 2: Aspirating a breast lump. Reprinted, with permission, from *Can Fam Physician* 1999;45:1928.*
Cyst Aspiration (cont’d)

Adequate/reassuring if:
1. Cyst fully collapses (no residual mass)
2. Fluid is not brown/red (cloudy ok)
3. Does not re-accumulate (i.e. frequent f/u)

• If all are true, no need to send fluid.
• F/u in 1-3 months to ensure no reaccumulation or residual mass
• If no fluid or if bloody → further workup

Fine Needle Aspiration: QUIZ

• FNAB should be done by an experienced cytopathologist or breast surgeon? ....TRUE OR FALSE?

• A diagnosis of FATTY TISSUE on FNA means what?

• When should you FOLLOW-UP a woman with a palpable mass and negative FNA and mammogram?
Fine Needle Aspiration Biopsy

- **Primary Use:** Diagnosis of solid masses
- Least invasive biopsy method
- Sensitivity is operator dependent:
  - For experienced personnel, 92-98%
  - For untrained personnel, 75% Average (as low as 65%).
- Experienced cytopathologist necessary to interpret
- Cannot diagnose DCIS, atypical hyperplasia or infiltrating carcinoma
- A non-diagnostic result in the setting of a discrete mass requires further work-up (possible sampling error)
### Palpable mass: Diagnostic Mammography

- Cannot accurately differentiate benign from malignant masses or cystic from solid
- Poor sensitivity in young women due to density
- 15-20% of mammos are normal in women with palpable mass
- Primary Use: Screen opposite breast (in women >40 yo) and identify other non-palpable suspicious areas
- Secondary use: Further classification of the palpable mass

**EVEN IF THE MAMMO IS NORMAL, FURTHER WORK-UP IS REQUIRED**

### Breast Cyst

- Can’t distinguish cyst from solid on mammogram

**Mammogram**

**Ultrasound**

- Cyst is anechoic on ultrasound
Breast Density

Small Cancer

Spiculated mass
Digital Breast Tomosynthesis Mammography (DBT)

- 3-D depiction of breast using moving mammogram machine
- Possibly: Slightly improved detection rates (esp in dense breasts), detection of smaller lesions, decrease in recall rates → No RCT’s yet
- Higher radiation dose: sometimes twice as high b/c do both traditional and DBT

Is improved detection (sensitivity) the goal?

- Only if it improves morbidity or mortality. (Otherwise you just label the person with cancer earlier but she has no benefit)
- It takes an RCT with meaningful patient outcomes to demonstrate whether DBT better than traditional mammo
Pt with mass marked by BB. Difficult to see well on mammography. Distinct edges on DBT. U/S confirmed a cyst.

Invasive ductal carcinoma: Subtle on mammography. Spiculated edges well seen on DBT.
Core Needle Biopsy

- Primary Use: Diagnosis of solid masses, f/u of non-diagnostic FNAB
- Unlike FNAB, it can distinguish DCIS from invasive disease and because it is a tissue specimen, interpretation is easier
- Few direct comparisons to FNAB for palpable lesions: Studies mixed for sensitivity—some showing FNA better and some with CNB better. Similar specificity.

Core Needle Biopsy (cont’d)

- Like FNAB, requires training to prevent false negatives due to sampling error
- Used instead of FNAB by consultant preference or where cytopathology service not skilled in interpretation
- Also preferred for evaluation of non-palpable lesions
Question 1

A 42 year old woman with no family or personal history of breast cancer has found a breast lump. She doesn’t know how long it has been there. It is not painful.

On exam, it is a discrete mass, about 2 cm, relatively smooth, mobile and non-tender. She has no axillary lymphadenopathy.

What is your next step?

So, what is the best first step?

- First step = determine if cystic or solid.
- How depends on your institution (availability and expertise of various services) and whether patient is symptomatic
- FNAB: Therapeutic, diagnostic and cost-efficient
- U/S: Similar in cost to FNAB, but FNAB more cost effective b/c 80% of masses are NOT cystic on U/S and will require FNAB to further evaluate
- If FNAB not available: U/S first will eliminate need for core biopsy in 20% that do have cysts
**So, what is the best first step?**

- **Office aspiration:** Reasonable 1st step esp if symptomatic. If not cystic, will require biopsy

- **Mammography:** not best 1st step b/c can’t reliably distinguish benign from malignant or cystic from solid (but is usually part of a complete evaluation)

- **F/U 1-2 mos:** Could be ok in young woman (<40) who will reliably follow-up. Discuss options, get agreement, document well. If mass persists, go to U/S or FNA.

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**Step 2: for a cystic mass...**

- If symptomatic, aspirate

- If diagnosed by ultrasound and no aspiration is done, f/u 1 year.

- If aspirated and fluid is not bloody, f/u 1-3 months to ensure no residual mass or re-accumulation

- For any patient >40, also get mammo for screening (>50 recommend, >40 shared decision)
**Step 2: for a solid mass**

Biopsy (FNA or core needle biopsy)  
PLUS  
Mammogram (to further characterize mass and to screen rest of breasts)  
• If both are negative, f/u 3-6 months  
• If either is equivocal or results are not concordant, refer to breast surgeon for further evaluation

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**Ultrasound F/u instead of biopsy for solid mass?**

- 2 small retrospective cohort studies—largest n=312 with palpable mass & U/S= “probably benign”  
- Mostly young women so low pretest probability of cancer (avg age 34yo)  
- Strict criteria for calling lesion “probably benign”  
- 2 of 312 were cancer. NPV=0.6%.  
- Conclude ok to not biopsy and follow with q 6mo u/s for 2 yrs (sim to f/u of birads3 mammo)  
- Caution: retrospective

Park, Acta Radiologica, 2008
How are we doing?

- In a study of women with a palpable mass and negative mammo, only 57% received **any** subsequent evaluation.
  - Latinas, obese and uninsured less likely to have any subsequent evaluation
- One study of delay in diagnosis found the most common reason was inappropriate reassurance of women with a lump and normal mammogram

Haas, JGIM, 2005; Goodson, Arch Int Med 2002

Summary: Palpable Breast Mass

- Choice of work-up often depends on availability and expertise of FNA, U/S and core needle biopsy
- None of these tests is 100% accurate, maintain a high index of suspicion
- If any of test is discordant ➔ continue work-up
- Frequent f/u even for masses thought to be benign to detect false negatives
**Evaluation of Abnormal Mammography Results and Palpable Breast Abnormalities**

**Recommended Review:** Kerlikowske, Annals Int Med, 2003

**Dominant Breast Mass**

- **U/S or Aspirate***
- **Simple cyst**
  - If aspirate and no residual lump, fluid not bloody then do CBE 4-6 wks. If u/s, no further w/u.

**Solid or complex cyst**

- Do FNA or core bx

**Cancer**

- Treat

**Atypical, suspicious**

- Core or excisional biopsy

**Benign**

- Positive Mammo
  - More imaging, core or excision bx

- Negative Mammo
  - CBE 3-6 mos

**Non-diagnostic**

- Repeat FNA, core or excision biopsy

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*Aspirate=office aspiration or FNAB*  
Adapted from Kerlikowske, Ann Int Med, 2003
Q1b: Palpable mass in 42 yo

A mammography was chosen and is negative. Next step (pick one)?

A. Re-examine in 1-2 months
B. F/u 1 year for annual exam
C. Ultrasound
D. Office aspiration
E. FNA
F. Core biopsy

Mammo cannot distinguish cyst from solid and is negative in 15% with palpable mass so need to proceed with work-up from Step 1 ie cyst vs solid

Q1c: Palpable mass in 42 yo

An ultrasound was chosen as the first step. It shows a cystic mass. Next step?

A. Re-examine in 1-2 months
B. F/u 1 year for annual exam
C. Office aspiration
D. FNA
E. Core biopsy

Simple cysts are benign and no further work-up is required. If the cyst is symptomatic, may aspirate in office.
Work-up of non-palpable lesions

<table>
<thead>
<tr>
<th>BI-RADS Assessment</th>
<th>Assessment</th>
<th>Definition</th>
<th>Examples of Type of Findings or Lesions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Negative</td>
<td>Breasts appear normal</td>
<td>Calcified fibroadenoma, secretory calcifications, fat-containing lesion (such as an oil cyst) or intramammary lymph node</td>
</tr>
<tr>
<td>2</td>
<td>Benign finding</td>
<td>A negative mammogram, but the interpreter wishes to describe a finding</td>
<td>A discrete, extremely well-defined round mass</td>
</tr>
<tr>
<td>3</td>
<td>Probably benign finding</td>
<td>A mammogram with a lesion with a high probability of being benign</td>
<td>Indeterminate calcification, mass, or breast density</td>
</tr>
<tr>
<td>0</td>
<td>Need additional imaging</td>
<td>A mammogram with a lesion for which additional imaging evaluation is needed; used almost always in a screening situation</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Suspicious abnormality</td>
<td>A mammogram with a lesion for which the radiologist has sufficient concern to recommend a biopsy</td>
<td>Punctate, linear, or amorphous calcifications; ill-defined mass; asymmetric breast density</td>
</tr>
<tr>
<td>5</td>
<td>Highly suggestive of malignancy</td>
<td>A mammogram with a lesion that has a high probability of being cancer</td>
<td>Spiculated mass, malignant-appearing microcalcifications</td>
</tr>
</tbody>
</table>

* BI-RADS = Breast Imaging Reporting and Data System.
Pre/Post Test Probability of cancer based on mammography results and age

Table 4: Risk for Breast Cancer Based on Age and Mammographic Interpretation

<table>
<thead>
<tr>
<th>Age and Type of Screening Examination</th>
<th>Risk for Breast Cancer before Mammography</th>
<th>Risk for Breast Cancer Based on Age and Mammographic Interpretation (BI-RADS Assessment)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Probability Benign Finding (3)</td>
<td>Need Additional Imaging Evaluation (6)</td>
</tr>
<tr>
<td>40-49 y First screening</td>
<td>0.003</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>0.0015</td>
<td>0.04</td>
</tr>
<tr>
<td>50-59 y Subsequent screening</td>
<td>0.006</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>0.009</td>
<td>0.07</td>
</tr>
<tr>
<td>60-69 y First screening</td>
<td>0.012</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>0.016</td>
<td>0.07</td>
</tr>
<tr>
<td>70 y and older First screening</td>
<td>0.014</td>
<td>0.07</td>
</tr>
<tr>
<td></td>
<td>0.017</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Follow-up of abnormal screening mammogram

- Abnormal screening mammography result (BI-RADS assessment)
  - Probably benign finding (BI-RADS assessment: 3)
  - Need additional imaging (BI-RADS assessment: 4)
  - Suspicious abnormality (BI-RADS assessment: 5)
  - Highly suggestive of malignancy (BI-RADS assessment: 6)

Diagnostic view of breast with suspicious lesion in 6 mo
Spot compression and magnification views or ultrasonography as soon as possible
Core-needle biopsy or needle localization biopsy as soon as possible

If normal, repeat screen 6 mos then q 1-2 yrs
Consider breast exam to see if lesion is palpable & biopsiable

Kerlikowske, Annals Int Med, 2003
Breast Pain

• 2/3 -3/4 report it
• > 1/2 of breast visits
• Etiology unknown: not associated with prolactin, estrogen or progesterone levels
• 2 types: cyclic & non-cyclic
• Both types chronic, relapsing especially if severe or early onset
• Severe breast pain interferes with sex (46%), activity (36%), social (13%), work (6%)

Mastalgia: Treatment

• Work-up: goal is to reassure them its not cancer; exam, mammo if >40 years
• Determine effect on QOL
• 60-80% resolve spontaneously.
• Reassurance often sufficient
Mastalgia: Treatment

Proven in RCT’s:
- NSAID's (topical and oral)
- Evening Primrose Oil
- Iodine
- Vitex agnus castus extract-containing solution (VACS)
- Gestrinone (N/A in US)
- Progesterone vaginal cream
- Bromocryptine
- Danazol
- Tamoxifen

No benefit (per RCT’s, though many are small and likely underpowered)
- Caffeine restriction
- Vitamin E
- Vitamin B6
- Diuretics
- Provera
- Soya protein
- Isoflavones

Other: Supportive, well fitting bra, bra at night, trigger point injections for localized pain
OCP’s—help some, make worse in others. If on OCP, try lower dose of Estradiol

Topical NSAID for mastalgia

Diclofenac topical (Voltaren) q 8hr vs placebo cream. Randomized, double-blinded

**Table 2. Average Change in Pain Scores Between and Within Groups**

<table>
<thead>
<tr>
<th>Group</th>
<th>No.</th>
<th>Before treatment</th>
<th>After 6 mo treatment</th>
<th>p Value*</th>
<th>Change in pain score</th>
<th>p’ Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclic mastalgia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment (Ia)</td>
<td>30</td>
<td>7.13 (1.38)</td>
<td>1.26 (1.25)</td>
<td>0.0001</td>
<td>5.87 (1.22)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Placebo (Ib)</td>
<td>30</td>
<td>7.23 (1.50)</td>
<td>5.93 (1.20)</td>
<td>0.0001</td>
<td>1.30 (1.34)</td>
<td></td>
</tr>
<tr>
<td>Noncyclic mastalgia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment (Ila)</td>
<td>24</td>
<td>7.16 (1.09)</td>
<td>0.83 (0.91)</td>
<td>0.0001</td>
<td>6.33 (1.34)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Placebo (Ilb)</td>
<td>24</td>
<td>7.37 (1.05)</td>
<td>6.25 (1.07)</td>
<td>0.0001</td>
<td>1.12 (1.11)</td>
<td></td>
</tr>
</tbody>
</table>

Data presented as mean values (standard deviation).
*Changes within groups (before versus 6 months after).
†Changes in pain within groups, Ia versus Ib and Ila versus Ilb, respectively; Ia versus Ila, p = 0.53, Ib versus Ilb, p = 0.96, respectively.

Colac, Journal of the American College of Surgeons, April 2003
Mastalgia: Prescribing Guide

Proven in RCT’s:

- **NSAID’s (topical diclofenac q 8hr very effective in 3 RCTs; oral NSAIDs—moderately effective in some but not all RCTS)

- **Evening Primrose Oil**: 1000mg tid for at least 1 mo trial, >$2/day, mild nausea. Recent meta-analysis showed no benefit.

- **Bromocriptine**: increase dose gradually to decrease side effects (nausea, dizziness, orthostatic hypotension, headache). 1.25 mg qhs, increase by 1.25 mg every week until 5 mg/day.

- **Danazol**: best of the endocrine agents but virulizing side effects make it less desirable, teratogenic, expensive. Start at 200mg qd. Taper down as tolerated to 100mg every other day or qd during luteal phase.

Proven in RCT’s (continued):

- **Tamoxifen**: 10 mg qd, hot flashes, expensive

- **Torimefin**: 30 mg qd, vag d/c, irreg menses

- **GnRH agonists**: very expensive, menopausal side effects, can only use for 6 months due to bone loss.

- **Local Injections**: trigger point injection of 1% lidocaine (1cc) and methyl prednisone (40mg). Half require second injection in 2-3 months.
Nipple Discharge

- Usually benign or malignant? benign
- Most common cause of unilateral discharge? intraductal papilloma
- Other causes: duct ectasia, nipple eczema, Paget disease, breast cancer/DCIS
- If associated with mass, more likely to be cancer (but cancer uncommonly presents with nipple d/c)


Nipple Discharge

Physiologic:
- Due to galactorrhea (ie increased prolactin) or nipple stimulation
- With compression
- Multiple ducts
- Clear, yellow, white
- No mass

Pathologic:
- Papilloma, cancer
- Spontaneous
- Single duct
- Bloody
- Mass present
Nipple Discharge: Diagnosis

Physiologic:
- History: running, breast stimulation
- Prolactin, TSH
- Meds: Psychotropics

Pathologic (Spont, unilat):
- Isolate involved duct
- Hemoccult to confirm blood, cytology not useful
- Mammography with retro-alveolar views
- Galactography vs MRI
- Surgery referral

Mastitis
- 2 types: lactating vs non-lactating
- Primary vs secondary (cellulitis, folliculitis, hyradinitis, sebaceous cyst)

Cellulitis
**Lactational Mastitis**

- Suspect in any breast-feeding woman with a fever and malaise
- Often wedge shaped redness over involved duct
- Staph, Strept—(community acquired MRSA becoming more common so do culture of milk)

**Non-Lactational Mastitis**

- Difficult to treat
- Often chronic, recurrent
- Peri-areolar: young (avg 32), 90% are smokers, central pain, nipple retraction and discharge, often assoc with abscess
- Peripheral: elderly, usually associated with underlying disease (diabetes) or trauma
- Gram negatives, staph, strept, anaerobes
# Mastitis Treatment

<table>
<thead>
<tr>
<th>Lactational</th>
<th>Non-Lacatational</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Increase feeding, warm compresses</td>
<td>- Include anaerobic coverage</td>
</tr>
<tr>
<td>- Keflex, Dicloxicillin</td>
<td>- Clindamycin or Flagyl + Ancef or Nafcillin</td>
</tr>
<tr>
<td>- IV if not better quickly</td>
<td></td>
</tr>
<tr>
<td>- Septra or Clinda for community acquired MRSA</td>
<td></td>
</tr>
</tbody>
</table>

** Biopsy if recurrent or doesn’t resolve

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## Cancer can mimic mastitis

**Inflammatory Cancer**
Breast Abscess

- Suspect if “lump” on exam or if mastitis not responding to abx
- Ultrasound to confirm
- Get culture
- Aspiration now preferred over I&D
- Sometimes need repeated aspirations or drain
- I&D often assoc with poor cosmetic result or fistula

The End…. Questions
Triple test

- Improved accuracy by combining:
  1. FNAB or core biopsy
  2. Mammography (or ultrasound)
  3. Physical exam

- When all 3 results concordant, 99% accuracy
- However, PE adds little b/c not specific. Its role is simply to document dominant palpable mass
- If any one is suspicious, core or excisional biopsy

Accuracy of triple test

<table>
<thead>
<tr>
<th>% cancer</th>
<th>Benign</th>
<th>Suspicious</th>
<th>Malignant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Mammography</td>
<td>100</td>
<td>100</td>
<td>62</td>
</tr>
<tr>
<td>FNA</td>
<td>Benign</td>
<td>Suspicious</td>
<td>Malignant</td>
</tr>
</tbody>
</table>
| Mass “benign “on Palpation