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

Actual
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 mammo

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

- Nether 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**

<table>
<thead>
<tr>
<th>Fibroadenoma</th>
<th>Cancer</th>
<th>Cyst</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well-circumscribed, superficial</td>
<td>Irregular, deep</td>
<td>Anechoic, well-circumscribed,</td>
</tr>
</tbody>
</table>

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

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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 mammo. Distinct edges on DBT. U/S confirmed a cyst.

Invasive ductal carcinoma: Subtle on mammo. 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 1\textsuperscript{st} step esp if symptomatic. If not cystic, will require biopsy.

• **Mammography:** not best 1\textsuperscript{st} 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.

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

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
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

U/S or Aspirate*

Cancer

Treat

Atypical, suspicious

Core or excisional biopsy

Benign

Positive Mammo

Repeat FNA, core or excision biopsy

Negative Mammo

CBE 3-6 mos

Non-diagnostic

More imaging, core or excision bx

* 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></td>
</tr>
<tr>
<td>2</td>
<td>Benign finding</td>
<td>A negative mammogram, but the interpreter wishes to describe a finding.</td>
<td>Calciﬁed ﬁbroadenoma, secretory calcifications, fat-containing lesion (such as an oil cyst) or intramammary lymph node</td>
</tr>
<tr>
<td>3</td>
<td>Probably benign</td>
<td>A mammogram with a lesion with a high probability of being benign.</td>
<td>A discrete, extremely well-deﬁned round mass, indeterminate calciﬁcation, mass, or breast density</td>
</tr>
<tr>
<td></td>
<td>finding</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</td>
<td>A mammogram with a lesion that has a high probability of being cancer.</td>
<td>Sclerotic mass, malignant appearing microcalciﬁcations</td>
</tr>
<tr>
<td></td>
<td>of malignancy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BI-RADS: Breast Imaging Reporting and Data System
Pre/Post Test Probability of cancer based on mammo 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>Most Probable Risk (3)</td>
<td>Additional Imaging Evaluation (5)</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>40-49 y</td>
<td>0.003</td>
<td>0.004</td>
</tr>
<tr>
<td>First screening</td>
<td>0.0015</td>
<td>0.004</td>
</tr>
<tr>
<td>Subsequent screening</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50-69 y</td>
<td>0.006</td>
<td>0.007</td>
</tr>
<tr>
<td>First screening</td>
<td>0.0028</td>
<td>0.009</td>
</tr>
<tr>
<td>Subsequent screening</td>
<td>0.013</td>
<td>0.016</td>
</tr>
<tr>
<td>60-69 y</td>
<td>0.013</td>
<td>0.001</td>
</tr>
<tr>
<td>First screening</td>
<td>0.012</td>
<td>0.001</td>
</tr>
<tr>
<td>Subsequent screening</td>
<td>0.014</td>
<td>0.017</td>
</tr>
</tbody>
</table>

* BI-RADS = Breast Imaging Reporting and Data System.
1 Based on the prevalence of breast cancer per 1000000 screened examinations for first screening (66); Surveillance, Epidemiology, and End Results cancer statistics for incidence of invasive breast cancer for subsequent screenings (65); and an estimated likelihood ratio. Adapted with permission from Kerlikowske et al. (140). (JAMA, 1994; 270(6)):42. Copyrighted 1996, American Medical Association.

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: 0)
  - Suspicious abnormality (BI-RADS assessment: 4)
  - Highly suggestive of malignancy (BI-RADS assessment: 5)

- 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

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 it’s 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>Nocyclic mastalgia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment (IIa)</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 (IIb)</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 value (standard deviation).

*Changes in pain within groups (before versus 6 months after).

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.

Mastalgia: Prescribing Guide

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

**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

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**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: 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, hydradinitis, 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 associ with abscess
- Peripheral: elderly, usually associated with underlying disease (diabetes) or trauma
- Gram negatives, staph, strep, anaerobes
Mastitis Treatment

Lactational
- Increase feeding, warm compresses
- Keflex, Dicloxicillin
- IV if not better quickly
- Septra or Clinda for community acquired MRSA

Non-Lactational
- Include anaerobic coverage
- Clindamycin or Flagyl + Ancef or Nafcillin

** Biopsy if recurrent or doesn’t resolve

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**

![Accuracy of triple test graph](image)

- Mass “benign “on Palpation