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

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)
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

“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
- Diagnostic Mammogram
- Digital Breast Tomosynthesis (DBT)
- 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. Digital Mammography
D. DBT: Digital Breast Tomosynthesis
E. Office aspiration
F. FNAB (fine needle aspiration biopsy)
G. 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. Standard diagnostic mammogram
D. DBT (digital breast tomosynthesis)
E. Office aspiration
F. FNA
G. 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 (50% accuracy)
- Not reliable for determining if biopsy needed
- Nonetheless, it is important for determining if mass is discrete (vs nodularity or thickening) and 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
  - Also can help to further classify mass via BI-Rads system for sono-- but much less data on risk of cancer assoc with each classification
- 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
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. However, >90% there is sufficient material to perform prognostic studies
- 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**

- Cyst is anechoic on ultrasound.
- Can’t distinguish cyst from solid on mammogram.

**Breast Density**

- Spiculated mass:
- Small Cancer.
Merriman’s: Waimea

What about DBT?
Digital Breast Tomosynthesis; “3D Mammography”
- 3-D depiction of breast using series of low-dose digital mammograms at various angles
- Better for delineating true lesions from spurious lesions caused by overlapping structures seen on routine mammography.
- Higher radiation dose: sometimes twice as high b/c do both a digital mammogram and DBT are done
  - Newer techniques have lower radiation dose but upgrading is costly

Is Breast tomosynthesis (DBT) better than mammography for palpable mass?
- Too soon to say: Most studies have been done in screening setting
- But promising —especially in the setting of dense breasts.
- A few small studies show better characterization of lesions when used in diagnostic setting leading to fewer biopsies

Pt with mass marked by BB. Difficult to see well on mammo. Distinct edges on DBT. U/S confirmed a cyst.
Breast Tomosynthesis: patient experience

Core Needle Biopsy
- **Primary Use:** Diagnosis of solid masses, f/u of non-diagnostic FNAB
- Can distinguish DCIS from invasive disease and because it is a tissue specimen, interpretation is easier (unlike FNA)
- Few direct comparisons to FNAB for palpable lesions: Studies mixed for sensitivity - some showing FNA better and some with CNB better. Similar specificity.
- Preferred for biopsy non-palpable lesions

Traditional Mammo vs DBT

Invasive ductal carcinoma:
- Subtle on mammo
- Spiculated edges well seen on DBT

Breast tomosynthesis: Radiology experience

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

**Plate lunch, loco moco, and malasadas**
Honokaa, past Waimea on the way to Hilo or Waipio Valley
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

Surveillance instead of biopsy for solid mass?

- Retrospective cohort study of 441 patients with benign solid lesions by sono (Birads 3 and 4A)
  - Excluded those with immediate biopsy (300) leaving 141 who had surveillance.
  - 3 of 141 had cancer in f/u biopsy
  - Unacceptably high rate (but small retrospective study with incomplete f/u)

Giess, Ultrasound Med, 2012
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.

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 test is discordant → continue work-up.
- Frequent f/u even for masses thought to be benign to detect false negatives.
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

Great Road Trip: Akaka Falls and/or Hawaii Tropical Botanical Gardens

A few miles outside Hilo. Incredibly lush. Quintessential Hawaii

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.

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Work-up of non-palpable lesions

<table>
<thead>
<tr>
<th>BI-RADS Assessment</th>
<th>Definition</th>
<th>Example of Type of Work-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI-RADS 0. Normal</td>
<td>Biopsy</td>
<td>Simple cysts are benign and no further work-up is required. If the cyst is symptomatic, may aspirate in office.</td>
</tr>
<tr>
<td>BI-RADS 1. Benign</td>
<td>Biopsy</td>
<td>Simple cysts are benign and no further work-up is required. If the cyst is symptomatic, may aspirate in office.</td>
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<tr>
<td>BI-RADS 2. Probably benign</td>
<td>Biopsy</td>
<td>Simple cysts are benign and no further work-up is required. If the cyst is symptomatic, may aspirate in office.</td>
</tr>
<tr>
<td>BI-RADS 3. Indeterminate</td>
<td>Biopsy</td>
<td>Simple cysts are benign and no further work-up is required. If the cyst is symptomatic, may aspirate in office.</td>
</tr>
<tr>
<td>BI-RADS 4. Suspicious for malignancy</td>
<td>Biopsy</td>
<td>Simple cysts are benign and no further work-up is required. If the cyst is symptomatic, may aspirate in office.</td>
</tr>
<tr>
<td>BI-RADS 5. Highly suggestive of malignancy</td>
<td>Biopsy</td>
<td>Simple cysts are benign and no further work-up is required. If the cyst is symptomatic, may aspirate in office.</td>
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</tbody>
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BI-RADS: Breast Imaging Reporting and Data System
Pre/Post Test Probability of cancer based on mammo results and age

<table>
<thead>
<tr>
<th>Age and Type of Screening Examination</th>
<th>Risk for Breast Cancer based on Age and Mammographic Interpretation*</th>
<th>Risk for Breast Cancer based on Age and Mammographic Interpretation (III-III finding)</th>
<th>Probable or definite malignancy (IV-V)</th>
<th>Need additional imaging evaluation (II)</th>
<th>Suspicious malignancy (I)</th>
<th>Highly suggestive of malignancy (III)</th>
<th>Overall or benign (I or II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>35-39 y</td>
<td>0.055</td>
<td>0.061</td>
<td>0.042</td>
<td>0.33</td>
<td>0.87</td>
<td>0.85</td>
<td>0.15</td>
</tr>
<tr>
<td>40-59 y</td>
<td>0.075</td>
<td>0.086</td>
<td>0.058</td>
<td>0.32</td>
<td>1.00</td>
<td>0.90</td>
<td>0.10</td>
</tr>
<tr>
<td>60-69 y</td>
<td>0.096</td>
<td>0.107</td>
<td>0.072</td>
<td>0.44</td>
<td>1.00</td>
<td>0.90</td>
<td>0.10</td>
</tr>
<tr>
<td>&gt;70 y</td>
<td>0.128</td>
<td>0.109</td>
<td>0.07</td>
<td>0.46</td>
<td>0.90</td>
<td>0.85</td>
<td>0.15</td>
</tr>
</tbody>
</table>

*ASO: Breast Cancer Detection and Surveillance Project
Based on the probabilities in Clinical practice guidelines for the screening mammography for women, ages 50 to 74 years, and the prevalence of breast cancer in this age group (10%), with a positive predictive value of 10%.

Follow-up of abnormal screening mammogram

- Abnormal screening mammography result (BI-RADS assessment 3)
  - Probable benign finding (BI-RADS assessment 2)
  - Need additional imaging (BI-RADS assessment 4)
  - Suspicious abnormality (BI-RADS assessment 5)
  - Highly suggestive of malignancy (BI-RADS assessment 6)

Diagnosis of breast with suspicious lesion within 6 mos
- Spot compression and magnification views or ultrasound as soon as possible
- Core-needle biopsy or needle localization biopsy as soon as possible

If normal, repeat screen in 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%)

Kalopa State Park
- Short nature hike or up to 5 miles
- Near Honoka’a, 15 miles past Waimea
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

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
- Tumesifen

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

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 virilizing 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
- Torimifin: 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? Malignant
- Most common cause of unilateral discharge? Benign 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

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

Pathologie:
- Papilloma, cancer
- Spontaneous
- Single duct
- Bloody
- Mass present

Nipple Discharge: Diagnosis

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

Pathologie (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)

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

Cellulitis
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

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