Empowering the Internist: How to Manage Common Breast Problems and Concerns

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EVALUATION OF A BREAST MASS

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Breast masses are a very common issue in primary care. Failure to diagnose breast cancer is the second most common malpractice claim in the United States. Although the majority of breast masses are benign, failure to identify new cancers has major consequences.

This section will focus on the approach to a woman with a new breast mass. We will discuss the basic approach to a breast mass in women of different ages, and different risk categories. We will review the imaging and diagnostic procedures available, their limitations, and their appropriate use. We will discuss surgical referral and appropriate follow up for different types of lesions. Although not all internists perform fine needle aspirations (FNA) or biopsies, it is important to have a basic understanding of testing and diagnostic procedures. This allows us to explain the process to our patients, answer their questions, and if needed, act as their advocates as they go through this difficult experience.

Given the legal implications of breast mass evaluation, regardless of the ultimate diagnosis, it is critical to have clear documentation of all of your visits, exams, and follow up plans.

A. Differential diagnosis of a discrete mass
   • Risk of malignancy by age in women presenting with a lump:
     Women <40: risk of cancer 1%
     Women aged 40-50: risk of cancer <10%
     Women >50: risk of cancer 40%
   • Differential based on age (most to least common):
     Age <40: fibroadenoma, cyst, other, cancer (rare)
     (In the above age group, cyst becomes more common than fibroadenoma after age 30)
     Age 40-50: cyst, cancer, fibroadenoma, other
     Age >50: cancer cyst, fibroadenoma, other
   • Factors which influence the differential and the risk of malignancy:
     Clinical features: history including risk factors, physical exam findings
     Imaging/radiographic appearance
     Aspiration/biopsy findings

B. Clinical features:
   • History
Clarify pain vs. true mass
Duration, change in size with menstruation and over time
Risk factors: Age >50, family history, hormone replacement therapy, prior malignancy,
parity, menopausal status, prior radiation, prior biopsies and history of atypical hyperplasia
(The presence of risk factors in a woman with a breast mass increases the risk for malignancy)
Associated nipple discharge and/or skin changes

• **Physical exam characteristics**
  Verify presence of the mass
  Benign characteristics: <2cm, mobile, well circumscribed
  Malignant characteristics: fixed, >2cm, irregular, single lesion
  Limitations of physical exam: individually characteristics are not good predictors

C. Imaging
  * Rule: a negative imaging study in the presence of a palpable lump does NOT rule out malignancy
  • **Diagnostic mammography**
    More useful in women >35, in women less than 35 it may not be as useful due to increased breast density in younger women.
    Evaluation of both breasts with additional views of the area of concern
    Correlation of imaging abnormality with location of palpable mass or masses
    Features of benign and malignant masses (well circumscribed vs. irregular, associated benign or malignant calcifications)

• **Ultrasonography**
  Alternative method to FNA for distinguishing a mass as cystic vs. solid
  (Especially if the lump is too small or deep for aspiration)
  Evaluation of a palpable mass with a negative mammogram
  Evaluation of persistent asymmetric nodularity for underlying mass
  Evaluation of a persistent mass after cyst drainage
  (Incomplete drainage vs. Solid component/complex cyst)

• **Limitations of mammography and ultrasound**
  Ultrasound cannot clearly distinguish benign from malignant solid masses
  A normal ultrasound or mammogram in the presence of a palpable mass does not rule out cancer. Further investigation with biopsy is necessary.
  *(FN rate for mammography is 10% in women >50, 25% in younger women)*

D. Aspiration/biopsy
  • **Fine needle aspiration (FNA):** Small 22-gauge needle and syringe used to withdraw fluid and cellular material from a mass. Can be diagnostic and
therapeutic for simple cysts providing complete resolution without the need for additional workup.

- **FNA needle biopsy (FNAB):** FNA done to obtain material for cytology evaluation, usually of a solid or complex mass. The test characteristics are VERY dependent on both the operator’s procedural experience and the cytopathologist’s interpretation of the results. Both should be well trained before performing this procedure. Many cytopathologists are skilled at performing this procedure and can achieve a FNR of <8%. Small size (<1cm) and younger age of the patient also increase the FNR.

- **Core needle biopsy:** Larger 14-16-gauge needle used to obtain larger tissue samples for histologic diagnosis. More invasive than FNA and more difficult to biopsy small or mobile lesions. As opposed to FNA, this procedure can distinguish invasive from non-invasive carcinoma (CIS) as well as proliferative lesions from CIS. Bleeding complications are higher than FNA. Outpatient/bedside procedure requiring local anesthesia and a small skin incision.

- **Excisional biopsy:** Removes the entire mass in one piece with a margin of surrounding tissue. Usually done in the operating room under sedation.

E. **Initial approach to the palpable breast lump**
   *(Excludes women over 50 in whom cysts are less common and malignancy is most likely)*
   1. Distinguish between cyst and solid using FNA or ultrasound
   2. Simple cysts can be managed conservatively with extremely low risk for malignancy
   3. Solid lesions or incompletely drained/complex cysts need to undergo biopsy +/- imaging

   **>35 years old**
   a. Diagnostic mammography
   b. FNAB, Core, or excisional biopsy in all women
   c. If results concordant:
      - Benign: consider observation with serial follow up
      - Malignant: excision (lumpectomy vs. mastectomy)
   d. If results discordant consider excision
   e. If indeterminate results or not visualized on mammography consider excision

   **<35 years old**
   a. Consider biopsy to confirm benign nature
   b. Close clinical follow up

4. **Exceptions:**
   Solid palpable lesions in a higher risk woman (>50 or presence of risk factors) or patients of any age with a breast mass that has several clinically malignant features needs to be evaluated for excision and should be referred to a surgeon or breast care specialist as soon as possible.
F. Follow up and referral

- Lesions with benign characteristics are usually reevaluated at 4-6 weeks then every 3-6 months for up to two years to establish stability or regression.
- Referral to a breast care specialist is reasonable in ANY woman with a breast mass or for a second opinion on an exam.
- Physicians who do not routinely do FNA or FNAB will refer patients earlier; an optional alternative first step is ultrasound to distinguish simple cysts.
- Follow up and referral is often dependent on the physician’s confidence in appropriate follow up of common lesions.
Evaluation of a Breast Mass

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OBJECTIVES

1. To review the important features of the history in evaluating a woman with a breast mass
2. To review the differential diagnosis of a breast mass
3. To review the physical examination findings that may help differentiate between benign and malignant masses
4. To review the use of mammography and ultrasound in evaluating a breast mass
5. To review the indications for fine needle aspiration (FNA), biopsy, and surgical excision of a breast mass
6. To review the initial approach to a breast mass including the indications for referral.
7. To review the appropriate follow up of different lesions.

REFERENCES


The palpable breast lump: information and recommendation to assist decision-making when a breast lump is detected. The Steering Committee on Clinical Practice Guidelines for the Care and Treatment of Breast Cancer. Canadian Association of Radiation Oncologists. CMAJ 1998; 158 Supl 3; S3.

CASE 1

A 32 year-old woman comes to see you because she has noticed a lump in her right breast. She first noted it during self-examination last month just before her period. She thinks it shrunk mid cycle but now has returned. She is due to begin her menses in 2 days. She tells you her maternal grandmother was diagnosed with breast cancer at age 70 but passed away from other causes. On physical exam she is an anxious young woman in no distress. Her breasts are equal in size without skin dimpling or nipple retraction. There is a firm, well-circumscribed round 1.5cm mass in the upper outer quadrant of her right breast. The area is freely mobile with mild tenderness. There is no nipple discharge and no axillary adenopathy. Her left breast appears diffusely lumpy without any discrete masses.

A. Are there any characteristics of her examination are concerning?
B. What is your differential diagnosis?
C. What further tests would you suggest?

You do not routinely do fine needle aspirations and obtain an ultrasound. The radiologist tells you that the ultrasound is consistent with a simple cyst. The patient is relieved but concerned and asks you what to do next.

D. Do you need to do anything further?
E. Is surgical referral appropriate?

She decides to have the cyst drained. You refer her to the breast surgeon for an FNA that yields clear fluid. There is complete resolution of the cyst after the procedure.

F. What type of follow up should you recommend?
CASE 2

A 56 year old African American woman comes to see you for her annual exam. She is in good health and had a normal screening breast and pelvic exam last year including a normal mammogram 8 months ago. On screening CBE now you find a 1.3cm discrete mass deep in the inferior peri-areolar region of the right breast (8 o’clock). The mass is non-tender, hard with slightly irregular borders and is not feely mobile. She has no skin dimpling, lymphadenopathy, nipple discharge, or retraction.

A. What is your differential diagnosis?

B. How would your differential diagnosis change if she was in her early 40s

C. Given her negative mammogram less than one year ago, should a repeat mammogram be ordered now? If so, should she have a unilateral, bilateral and/or spot view mammogram? What are you looking for on the mammogram?

D. Would an ultrasound provide additional diagnostic information?

E. What type of biopsy procedure should she expect to undergo at this point?

F. How would you counsel the patient if the initial biopsy revealed normal breast tissue?

G. At what point in her management is surgical referral indicated.
CASE 1

A. There are no malignant characteristics on her physical exam. The benign characteristics of her exam include: small size, mobility, not being fixed to other structures, tenderness, and the mass being well circumscribed. Further reassuring signs are that there is no skin dimpling, nipple discharge or nipple retraction. Worrisome physical exam findings are single hard lesions, immovable, and irregular in shape.

B. The differential diagnosis includes:

- Cyst (simple or complex)
- Fibroadenoma
- Fibrocystic breast changes,
- Papilloma (often associated with nipple discharge)
- Galactocele
- Hemartoma,
- Tubular adenoma
- Fat necrosis
- Neoplasm
- Infection
- Hematoma

C. You must decide if this is a simple cyst or a more complicated lesion. Imaging options include ultrasound and mammography. In a young woman with very few risk factors, mammography can be very misleading. One approach is to do an ultrasound, if a cystic lesion is found FNA may not be necessary. Alternatively, an FNA can be attempted in the office without ultrasound. Nonbloody fluid does not need to be sent to pathology. Although some general internists perform FNA, many women will need to be referred to a surgeon or breast specialty clinic for this procedure. This is one area where extra training can be obtained so that the general internist can feel confident in performing this procedure.

D. Simple cysts almost never go on to become malignant. Simple cysts may not need drainage or aspiration and can often be followed clinically. Below are some guidelines for drainage and follow up.

- Indications for aspiration of a simple cyst: Tenderness or discomfort for patient, patient requesting drainage, cysts >2cm. Follow up every 3-6 months for one year is indicated if drainage is not done.
- If the fluid is clear/yellow/straw colored it may be discarded. If it is bloody in appearance it should be sent for cytology.
• If aspiration is done, the patient can be followed closely as the risk of cancer from cysts is very low. Initial follow up at 4-6 weeks is recommended with subsequent follow every 3-6 months for one year.
• If there is any mass remaining after aspiration, she should be evaluated for a core or open biopsy. It is important to remember that FNA has a false negative rate of 15-20%.
• If the mass does not feel cystic, or an aspiration does not yield fluid, she should be referred for ultrasound if this has not yet been done, and either fine needle aspiration biopsy or core needle biopsy.

E. It is always appropriate to refer any woman with a mass, even a simple cyst, to a surgeon.

*** Both the physician and the patient should be comfortable with serial follow up exams to evaluate size and character of the lesion.

F. Her results are consistent with a simple cyst. The fluid is not bloody and therefore does not need to be sent for pathology. If the mass fully resolves she can be followed according to the guidelines below. If there is any question about resolution and ultrasound can be done for further assessment.

• **Cyst:** She has findings consistent with a cyst that resolved with drainage. If it does not reappear within 4-6 weeks, she can be followed with clinical examinations every 3-6 months for one year and then return to yearly screening and monthly SBE.

• **Fibroadenomatous disease:** She can consider having the lesion removed, once removed she may form other fibroadenomas in the future. Pregnancy can sometimes cause these benign lesions to increase in size and number. If she chooses to have surgery, she should be examined post operatively and then every 6 months for one year. After the first year she can be examined yearly thereafter. If she does not have the mass removed she should be examined at 3 months, then every 6 months for two years. If she becomes pregnant breast exams should be part of her prenatal care.

• **Vague nodularity.** She has findings consistent with this in her left breast. It is reasonable to follow this every 3-4 months and attempt aspiration of any suspicious areas.
CASE 2

A. Neoplasm: carcinoma in situ and invasive cancer
   Fat necrosis or hematoma (if history of breast trauma or infection)
   Papilloma (usually associated with nipple discharge 80-90% of the time)
   Infection (subareolar abscess)
   Cyst (if on HRT, otherwise unlikely in this age group)
   Other rare breast tumors including hamartoma, tubular adenoma, sarcoma, lipoma
   Fibroadenoma: less common in postmenopausal women
   Fibrocystic changes

   Her mass has most of the “classic characteristics” associated with cancerous lesions except that of size (<2cm). Individually, these features do not distinguish well between benign and malignant disease. Over 25% of palpable breast cancers present at a size smaller than 2cm. Taking these features together (single, hard, immovable, irregular borders), this lesion would be considered clinically suspicious for malignancy. The “reassuring” features on clinical exam are no longer those that distinguish benign from malignant lesions, but rather the absence of clinical features associated with locally advanced or metastatic disease and thus a poorer prognosis, given the clinical suspicion for malignancy.

   Approximately 40% of women older than 55 and presenting with a breast mass will be diagnosed with breast cancer. This risk does not take into account the clinical or radiologic features of the mass. In our patient’s case, based on the clinical features of the mass, the risk of breast cancer in her is likely to be much higher than 40%.

B. Risk of cancer in women 40-50 presenting with a lump <10%, probably slightly lower in the early 40s; the differential diagnosis includes Cyst, Fibroadenoma, Cancer, others less likely.

C. Yes, a new bilateral “diagnostic” mammogram should be performed. It will provide information about this palpable lesion such as size and extent of disease if this proves to be cancer. This may influence treatment decisions. Even if the mammogram does not provide information about the palpable lesion, or does not show the lesion, the lesion will still need to be evaluated by tissue sampling. Equally important, the bilateral mammogram is obtained to evaluate the remaining bilateral breast tissue for evidence of additional lesions and/or extent of disease if this is cancer. This will aid the surgeon in planning the type of surgery for excision and treatment if cancer is diagnosed (conservative tissue sparing or radical mastectomy). Spot views are generally reserved for further characterizing
a radiologically detected breast density or can be used if the breast tissue is dense on mammography and the palpable area in question cannot be well visualized.

(Her mammogram reveals a malignant appearing 1.7 cm spiculated mass in the same area as the palpable abnormality. There are no other abnormalities noted in either breast.)

D. No. The likelihood that this is a simple cyst is very low. Therefore the results of the ultrasound would not change the management at all. The only potential benefit of performing this additional test in the setting of a palpable mass in a post-menopausal woman would be if the mass was too deep or too small (<1 cm) for biopsy. If visualized by ultrasound, the lesion could be biopsied or localized (with a small wire) for excision by ultrasound guidance, which may be easier than by mammographic (stereotactic) guidance.

E. There are several different ways to approach the biopsy and excision of a discrete mass in the breast of a postmenopausal woman. You should become familiar with your surgeon’s approach so that you can counsel your patients appropriately on what to expect.

Most of the difference in practice patterns involves whether a diagnosis is established up front with a minimally invasive biopsy procedure (Core or FNA), or the patient goes directly to the OR for excisional biopsy.

Having the diagnosis established prior to going for surgery: pros and cons

Pro:
1. Preserves all of the patient’s treatment options and allows for a discussion where the patient is truly part of the decision making process.
2. Decreases the chance of multiple operating room trips, thereby decreasing patient anxiety and associated operative risks
3. this tactic may increase the chance of successful breast conservation therapy by decreasing the chance of inadequate margins (still small chance of discrepancy between frozen and permanent sections)

Con:
1. Occasionally this requires more than one biopsy procedure and can prolong the period of uncertainty and anxiety for patients

F. You and the patient should still be concerned the lesion may be malignant until it is removed from the breast and proven otherwise. You have two components (clinical exam and mammogram) that suggest malignancy, therefore you must treat this as malignancy and the lesion should be excised. While there are pathologic diagnosis other than cancer that are possible, the one thing that a lump in the breast is not is "normal breast tissue". Chances are that the operator missed the lesion on biopsy, which was done without image guidance, and obtained
surrounding breast tissue. Repeat biopsy would also be reasonable to establish the diagnosis prior to surgery. Image guided biopsy with ultrasound or mammographic guidance could be considered in this case. While it is also possible for this sampling error to occur with the image guidance it is less likely to happen. Should the second biopsy fail to diagnose the nature of the lesion, excision is warranted. A pathologic diagnosis that is concordant with the mammographic and physical exam findings needs to be established by some means, even if this is by excisional biopsy.

G. Surgical referral is indicated at the time you detect the discrete mass in the breast. Many surgeons feel that irrespective of the mammogram or biopsy results, ANY discrete mass in an older postmenopausal or a high risk woman should be excised because of the increased chance of malignancy in this population presenting with a lump.
The Abnormal Mammogram: What it Means and What to Do

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Objectives

1. Review the basics of mammographic breast evaluation. Sample mammograms will be shown to illustrate points.
2. Become familiar with the language used in mammographic reports and understand the meaning of the American College of Radiology Breast Imaging Reporting and Data System (BI-RADS) criteria. Sample mammogram reports will be reviewed.
3. Review options for further evaluation when mammographic abnormalities are found, and understand the situations in which each option is appropriate.
4. Discuss follow up recommendations after an abnormal mammogram, and understand when it is appropriate to return to routine screening.
5. Discuss what to say when communicating results to patients, and how to provide support to enhance adherence to the treatment plan.

Case 1:

Age: 56
Indication: Routine screening.

Report: No prior films are available for comparison. The breasts are heterogeneously dense. There is an area of increased density in the left retroareolar region, slightly lateral and superior to the nipple. Additional views are necessary to verify that no underlying lesion is present.

Conclusion: BI-RADS 0 - Incomplete; additional imaging evaluation needed.

1. What important information is contained in these and all mammogram reports?

In an effort to reduce this confusion, standardize mammographic reporting, and facilitate measurement of medical outcome audit data, the American College of Radiology (ACR) in collaboration with the National Cancer Institute and others developed the Breast Imaging and Reporting System (BI-RADS™)(2). According to this system, the mammogram report should include: 1) a statement indicating whether the current exam has been compared to previous mammograms and if not included, it should be assumed that no comparison was made, 2) a succinct description of overall breast tissue, 3) a description of any significant findings including masses, calcifications, focal asymmetry, or architectural distortion, 4) a final assessment which classifies the study into one of 6 categories as defined by BI-RADS™; each category reflects a recommended course of action.
2. **What are the American College of Radiology BI-RADS categories? What is the probability of malignancy associated with each category?**

The American College of Radiology (ACR) Breast Imaging Reporting and Data System (BI-RADS) was designed to standardize mammography reporting, reduce confusion in breast imaging interpretation, and facilitate outcome monitoring. Mammographic findings are classified into one of 6 categories outline in the following table.

<table>
<thead>
<tr>
<th>Category</th>
<th>Assessment (as per MQSA)</th>
<th>Recommendation</th>
<th>Likelihood of malignancy</th>
<th>Types of lesions</th>
</tr>
</thead>
<tbody>
<tr>
<td>BI-RADS 0</td>
<td>Incomplete</td>
<td>Comparison films or additional imaging necessary</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>BI-RADS 1</td>
<td>Negative</td>
<td>Routine Screening</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>BI-RADS 2</td>
<td>Benign finding</td>
<td>Routine screening</td>
<td>--</td>
<td>calcified fibroadenomas; multiple secretory calcifications; fat-containing lesions; intramammary lymph nodes, and breast implants, dense breasts</td>
</tr>
<tr>
<td>BI-RADS 3</td>
<td><em>Probably Benign Finding</em></td>
<td>Short-term follow-up suggested.</td>
<td>&lt;2%</td>
<td>clusters of tiny calcifications, all round or oval; non-palpable, non-calcified, well-circumscribed solid masses; non-palpable focal asymmetric fibroglandular densities with concave outward margins and/or interspersed with fat; miscellaneous focal findings; and multiple similar lesions, either calcifications or masses, randomly distributed in both breasts.</td>
</tr>
<tr>
<td>BI-RADS 4</td>
<td>Suspicious Abnormality</td>
<td>Biopsy should be considered</td>
<td>2-90%</td>
<td>non-palpable, partially circumscribed masses with more than 25% of the border obscured; microlobulated masses; granular microcalcifications.</td>
</tr>
<tr>
<td>BI-RADS 5</td>
<td>Highly Suggestive of Malignancy</td>
<td>Appropriate action should be taken</td>
<td>&gt;90%</td>
<td>irregular, dense, spiculated masses with or without calcifications; or calcifications in the absence of a mass which have a heterogeneous, pleomorphic, branching, or casting pattern</td>
</tr>
</tbody>
</table>

3. **What are your concerns about Case 1? How will you manage this patient?**

The woman in Case 1 has a mammographically detected area of focal increased breast density that is incompletely defined on initial screening views. The overall increased density of her breast tissue is also a concern since high breast density is both a risk factor for breast cancer and limits the sensitivity of mammography. She should be contacted and notified that further evaluation is necessary. A clinical breast exam should be performed if not done recently, as the presence of a palpable lesion increases the chance of a malignancy and should be handled as for any palpable lesion. If on further diagnostic views, no underlying lesion is seen, radiology recommendations should be followed regarding further follow-up. This will usually involve a short-term follow-up mammography in six months to ensure stability.

4. **What are the legal requirements regarding mammogram results notification?**

In an effort to improve the quality of services provided by mammography facilities, Congress passed the Mammography Quality Standards Act (MQSA) on 10/13/92. The MQSA, which was revised in 1998, and became law on 4/28/99, includes regulations regarding the clarity and efficiency of mammogram result reporting to both patients and their referring clinicians. The Act stipulates that the imaging facility must send a written report to the referring clinician no later than 30 days from the date of the mammogram. If the assessment is suspicious or highly suggestive of malignancy, reasonable attempts to communicate as soon as possible should be made. The FDA Quality Mammography Standard Act: Final Rule requires that the written report be sent to referring health care providers and a lay summary of the written report be sent directly to all patients within 30 days of the exam. If the mammogram is a BI-RADS category 4 or 5, the patient it is recommended that the patient should be notified within five days of the exam and attempts should be made to notify the health care provider as soon as possible.

5. **What are the responsibilities of the primary care clinician regarding notification? Regarding coordination of evaluation and adherence to follow-up?**

The lack of timely follow-up in women who have abnormalities found on screening mammograms and suffer delays in cancer diagnosis is an increasing cause of breast-related malpractice claims in the U.S. Primary care clinicians are responsible for ensuring timely notification of test results, coordinating the work-up when abnormalities are found, and facilitating patient adherence to the treatment plan.

**Case 2:**

*Age:* 50  
*Indication:* Routine screening.  
*Report:* No prior films are available for comparison. There are scattered fibroglandular densities. A 1.2 cm well-circumscribed nodule with lower density than the surrounding breast tissue is seen in the lower outer quadrant of the left breast. This may represent an intramammary lymph node. No suspicious masses, clustered micro calcifications, or architectural distortion are seen.  
*Conclusion:* BI-RADS 3 - Probably benign; a six-month follow-up left breast mammogram is recommended to ensure stability.
6. **What are your concerns about Case 2? How will you manage this patient?**

   Overall, the mammogram report in Case 2 is reassuring: well-circumscribed lesions that have a density lower than surrounding breast tissue are likely to be benign. Although the radiologist speculates that this lesion could be an intramammary lymph node, this diagnosis cannot be made with certainty unless the lesion is clearly radiolucent (fat containing) and is located in the upper outer quadrant of the breast. Moreover the stability of the lesion cannot be assured since no prior mammograms were available for comparison. Although the term fibroglandular densities may sound worrisome, it is a normal finding. As in case 1, the patient should be contacted and informed that further evaluation is necessary. If prior films are available and the lesion is old and stable, further evaluation is not necessary. If no prior films are available or the abnormality is new or changed, six-month interval imaging is necessary. If the six-month mammogram is unchanged, bilateral diagnostic mammography is then obtained at 12, 24, and 36 months following the initial exam.

7. **She asks to “have the lump out” to be sure it is not cancerous. What will you tell her?**

   Reassurance regarding malignancy risk is appropriate since 98% of well-circumscribed solid lesions like this are benign. Moreover, few (0.5%) of lesions that change during follow-up are malignant, and when cancer is found it has been found to be stage 0 or 1. Most women will be reassured by this information - less than 1% of patients will insist on a biopsy because of anxiety. Biopsy of a category 3 lesion may be appropriate if follow-up is compromised or not available, either because of geography, plans for future pregnancy, or plans for breast augmentation or reduction surgery.

8. **Which patients are at greatest risk for untimely follow-up? What office systems might be helpful to ensure adherence to the treatment plan?**

   The percentage of women with adequate follow-up is as high as 30% in some settings. Factors associated with greatest risk of untimely follow-up are: age 65 and older, lower socioeconomic status, difficulty accessing care, perceiving health as fair or poor, performing breast self-exam infrequently, and being instructed to have a repeat mammogram in four to six months time. Use of computer tracking systems increases timely follow-up to 89-99%.

9. **How can the importance of further evaluation/follow-up be presented without causing undue patient anxiety?**

   Sensitive communication is paramount when results are abnormal and additional evaluation is required. Many women interpret the news of an abnormal mammogram to mean they have breast cancer. It is often helpful to ask explicitly about a woman’s concerns, and to offer to include a trusted friend or family member in the discussion. It is also important to examine a woman's cultural beliefs about cancer, since certain beliefs are associated with diagnostic delay and presentation with more advanced disease. Examples include: cancer is a punishment for improper or immoral behavior, the devil can cause a person to get cancer, having cancer causes family dishonor, breast surgery is dangerous and makes the cancer spread, women who have breast
surgery are no longer attractive to men, and breast cancer is incurable. An attempt should be made to dispel myths, and the fact that breast cancer is a treatable, and even curable, disease should be communicated to all women. Resources for support in the community should be reviewed with the patient: some institutions have their own support groups for women undergoing breast biopsy.

Some patients seem relatively unconcerned about an abnormal mammogram reading because they perceive their risk for breast cancer to be low, or because they have no symptoms or findings on clinical breast exam. Other women ask directly about whether their mammographic abnormality is breast cancer. While statistics can provide a rough estimate of the likelihood of cancer in each case, it is important to avoid giving a patient reassurance based on her benign history or lack of physical exam findings that might encourage her to forgo further evaluation. Instead, a statement such as the following may be helpful: “Your history suggests you are not at high risk for breast cancer and you have no symptoms (start off positively). However an abnormality on a mammogram can be the first sign of breast cancer, so we will need to arrange additional tests to find out exactly what your abnormality is. If the tests show that you have breast cancer, we will be able to treat it properly. Hopefully, the tests will be normal, and we will be able to stop worrying about cancer altogether”.

Diagnostic tests and procedures should be described in detail so a woman understands what she will experience. The roles and responsibilities of various clinicians involved in the evaluation (primary care clinician, radiologist, breast surgeon) should be explicitly discussed: patients should know how, when, and from whom they will hear their results. Special outreach efforts to women at high risk for inadequate follow-up may be worthwhile.

Case 3:

**Age:** 48

**Indication:** 6-month follow-up exam of left breast microcalcifications

**Report:** Comparison is made to previous mammograms. There has been a subtle, but definite increase in the number and pleomorphic branching of the group of microcalcifications in the central portion of the left breast. No architectural distortion or suspicious lesions are identified otherwise.

**Conclusion:** Abnormal left breast microcalcifications

BIRADS 4 - biopsy recommended.

10. The patient is uncomfortable with the idea of having a biopsy. She asks about the likelihood of cancer and the risks of waiting. What do you tell her?

The risk of malignancy in BI-RADS 4 category lesions ranges from 2-90%, with an average of approximately 30% in two of the largest series, and is too high to justify waiting.
11. **What biopsy options are available? What are the pros and cons of each option? Are there any advantages to ultrasound versus stereotactic guidance?**

The two options for biopsy of mammographically detected, non-palpable abnormalities are percutaneous image-guided biopsy or needle localization excisional biopsy. In general, if available and feasible, percutaneous image-guided biopsy is performed for a BI-RADS 4 lesion. If a percutaneous image-guided biopsy of a BI-RADS™ category 4 lesion yields a benign diagnosis, which is concordant with the imaging characteristics, the woman is spared a surgical procedure, which is more costly and may result in more tissue being removed.

The guidance methods used most often for percutaneous needle biopsy of the breast are ultrasound and stereotaxis. Ultrasound guidance is primarily used for the localization and biopsy of breast masses, but may be used for any abnormality that is adequately visualized sonographically. Advantages of using ultrasound guidance includes accessibility to all parts of the breast and axilla, real-time visualization of the needle to verify sampling of the abnormality, patient comfort, lack of ionizing radiation, use of multipurpose high resolution ultrasound equipment, and lower cost. Unlike stereotactic equipment, which localizes the abnormality by a predetermined angle of imaging and use of a computer software program to calculate the parameters for targeting, ultrasound is “operator-dependent” and the accuracy and adequacy of tissue sampling is dependent on the skill and experience of the radiologist. Furthermore, it does not require dedicated equipment, as does stereotactic guidance.

Stereotactic guidance, which utilizes specialized mammographic-type equipment, may be useful for all types of mammographic lesions, both masses and calcifications. There may be certain limitations to the use of stereotactic guidance related to the patient’s ability to maintain the required positioning for the procedure, breast size/thickness or the location of the abnormality within the breast. In this case, since there are microcalcifications, without a mass, stereotactic guidance would generally be used.

12. **The patient undergoes an US guided percutaneous biopsy, which shows no evidence of breast cancer. When should the patient return for her next mammogram?**

Follow-up protocols may vary, but in general adhere to the following recommendations. If the most or all of the calcifications are removed and the biopsy yields a specific, benign diagnosis, the patient should have diagnostic mammograms at 12, 24, and 36 months to ensure stability. If there are residual calcifications or nonspecific benign histology, short-interval follow-up with an ipsilateral mammogram at 6 months and bilateral diagnostic mammogram at 12, 24, and 36 months is a common approach.
REFERENCES

BREAST PAIN

Frances Norlock, DO, MPH
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OBJECTIVES
1. To learn the epidemiology, types, and proposed etiologies of common breast pain.
2. To understand breast pain’s relationship to breast cancer and affective disorders.
3. To review how to evaluate breast pain.
4. To learn how to treat benign mastalgia based on type, severity and duration.
5. To learn when to refer to the breast surgeon for breast pain.

EPIDEMIOLOGY
- 40% - 60% of women experience breast pain
  - 10% moderate-severe ≥ 5 days each month
  - 3.4% report breast pain to their physicians
- Interference: sexual activity (48%), physical activity (37%), social activity (12%), work/school (8%)

Table 1. Different Types of Breast Pain

<table>
<thead>
<tr>
<th>CYCLICAL</th>
<th>NONCYCLICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>60% - 75% of benign breast pain cases</td>
<td></td>
</tr>
<tr>
<td>20’s - 30’s</td>
<td>30’s – 40’s</td>
</tr>
</tbody>
</table>
| 7-10 days prior to menses | no association with the menstrual cycle
| relieved w/menses and menopause | average duration of 3 years
| heavy, aching, tender, bilateral or nonfocal, UOQ’s | bilateral/ unilateral, sharp, burning, localized (central/ subareolar)/ ILQ’s
| 82% of women w/ cyclical breast pain do NOT have PMS | overall severity of pain related to size of affected area
| +/- fibrocystic changes | treatments less effective
| fibrocystic women can be asymptomatic | |

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Table 2. Etiologies of Breast Pain

<table>
<thead>
<tr>
<th>Cyclical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premenstrual syndrome</td>
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<tr>
<td>Caffeine intake</td>
</tr>
<tr>
<td>Gammalinolenic acid deficiency</td>
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<tr>
<td>Progesterone deficiency</td>
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<tr>
<td>Prolactin hyperresponsiveness</td>
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<tr>
<td>High-fat diet</td>
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</table>

<table>
<thead>
<tr>
<th>Noncyclical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammary</td>
</tr>
<tr>
<td>Cyst</td>
</tr>
<tr>
<td>Fibroadenoma</td>
</tr>
<tr>
<td>Ductal ectasia</td>
</tr>
<tr>
<td>Sclerosing adenosis</td>
</tr>
<tr>
<td>Periductal mastitis</td>
</tr>
<tr>
<td>Caffeine intake</td>
</tr>
<tr>
<td>Oral contraceptives</td>
</tr>
<tr>
<td>Hormone replacement therapy</td>
</tr>
<tr>
<td>Pregnancy</td>
</tr>
<tr>
<td>Ovarian dysfunction (menopause, tubal ligation)</td>
</tr>
<tr>
<td>Breast cancer</td>
</tr>
<tr>
<td>Trauma</td>
</tr>
<tr>
<td>Thoracoepigastric vein thrombophlebitis (Mondor's disease)</td>
</tr>
<tr>
<td>Postsurgical site</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extramammary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Musculoskeletal pain (pectoralis major trigger points)</td>
</tr>
<tr>
<td>Costochondral junction inflammation (Tietze’s Syndrome)</td>
</tr>
<tr>
<td>Coronary artery disease</td>
</tr>
<tr>
<td>Cervical radiculopathy</td>
</tr>
<tr>
<td>Esophageal reflux</td>
</tr>
<tr>
<td>Pulmonary abnormality</td>
</tr>
<tr>
<td>Shingles</td>
</tr>
</tbody>
</table>
BREAST PAIN AND THE RISK OF BREAST CANCER
- 2% of women with breast pain alone have occult breast cancer
  - Double the rate of asymptomatic screening population (1%)
- <7% of painful lumps are cancer

BREAST PAIN AND AFFECTIVE DISORDERS
- Inconsistent relationship with depression or anxiety
- Anxiety among severe mastalgia patients similar to that experienced by breast cancer patients the morning of breast surgery.
- Cyclical breast pain - higher levels of anxiety
- Pain relief – depression improved but not anxiety
- Relationship w/other chronic pain disorders – back pain, abdominal/pelvic pain, headaches, arthritic pain, fibromyalgia
- Relationship to history of sexual assault or child abuse has not been studied

EVALUATION OF BREAST PAIN
- History and physical exam
- Breast pain diary
- Diagnostic imaging

HISTORY AND PHYSICAL EXAM
- Relationship to menses
- Noncyclical pain – mammary vs. extramammary cause
- Degree of pain and effect on quality of life (see Fig.1)
- Presence or absence of a mass; assess breast cancer risk
- Other exacerbating factors (pregnancy, caffeine intake, diet, trauma, tubal ligation)
- Exogenous hormones (hormone replacement therapy, oral contraceptives)
- NOT associated - race, age, menarche, marital status, parity, age at first childbirth
- Physical exam - very gentle palpation, assess underlying ribs

BREAST PAIN DIARY
- Magnitude of breast pain
- Cyclical vs. noncyclical mastalgia
- Review use of pain relievers and response to treatment
- “Clinically significant mastalgia” = score of 3.5 for 5-7 days (arbitrary cut-off)
Figure 1. Present Pain Index and Quality of Life Questions. Adapted from a modified version of the short form of the McGill Pain Questionnaire. (Khan SA, Apkarian AV. The characteristics of cyclical and non-cyclical mastalgia: a prospective study using a modified McGill Pain Questionnaire. Breast Cancer Res Treat. 2002;75:147-157. Available at: apkarianlab.northwestern.edu)

Present Pain Index (PPI):
Which word below best describes the amount of your overall breast pain? Check one.

_____Mild (1)
_____Discomforting (2)
_____Distressing (3)
_____Horrible (4)
_____Excruciating (5)

Quality of Life (QOL):
Has your breast pain affected your work schedule? ___Yes ___No
Has your breast pain affected your sleep pattern? ___Yes ___No
Has your breast pain affected your sexual activity? ___Yes ___No
Do you take medications to relieve your breast pain? ___Yes ___No
If yes, which medications do you use to relieve breast pain? ______________________

Do you have other pains besides breast pain? ___Yes ___No
If yes, where? ____________________________
how often? ____________________________
Does it coincide with your breast pain? ___Yes ___No
Do you take any medications to relieve this pain? ___Yes ___No
If yes, which medications do you use to relieve your other pain? ______________________
Figure 2. Visual Analog Pain Scale (VAPS)

<table>
<thead>
<tr>
<th>Date</th>
<th>Pain</th>
<th>Period (Y/N)</th>
<th>Medication (Y/N)</th>
<th>Relief (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>2</td>
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<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Figure 3. Algorithm for the Evaluation of Breast Pain

- History
  - Clinical examination
    - Pain and breast mass
      - Assess mass appropriately (imaging, FNA, surgery referral)
    - Pain +/- nodularity
      - Ultrasound if <35 y/o & anxious
      - Mammogram if >35 y/o
      - Instruct patient on breast pain diary
    - Extramammary Cause
      - Appropriate evaluation and treatment for causes listed in Table 2.
ROLE OF RADIOLOGY
Mammography
- Increased use in breast pain patients vs. asymptomatic women (32% vs. 6.9%)
- No evidence to support the use of mammography for women < 40 years of age with breast pain
- Performed if mammogram not done in past 6 months and

Ultrasound
- < 35 years of age to rule out cyst or solid mass as cause of pain
- More useful for patient reassurance than cancer detection
  - 110 U/S – no cancers found among 99 women with focal breast pain without an associated mass (77% negative, 14% cysts, 6% edema, 3% benign solid masses)

TREATMENT OF BENIGN BREAST PAIN NOT ASSOCIATED WITH A MASS
- Degree (mild/moderate vs. severe) and type of breast pain (cyclical vs. noncyclical) will guide initial treatment
- Most pain resolves with reassurance, lifestyle changes and OTC pain relievers
- If pain severe – primrose oil capsules in addition to lifestyle changes
- Prescription medications – when reassurance and nonprescription modalities have failed AND IF PAIN SEVERE ENOUGH TO INTERFERE WITH DAILY ACTIVITIES
- Noncyclical breast pain more difficult to treat
- Treatments NOT more effective than placebo – vitamin B₆, vitamin E, diuretics
- If worsening or no improvement – reassess patient’s history, breast cancer risk factors and CBE; diagnostic imaging if not performed in past 6 months.

TREATMENT OF BREAST PAIN ASSOCIATED WITH AFFECTIVE DISORDERS AND CHRONIC PAIN DISORDERS
- Relationship to other chronic pain disorders demonstrated
  - Gabapentin or amitriptyline
- Anxiety and PMS both associated with breast pain
  - SSRI
- Refer to appropriate specialist for treatment of untreated depression, anxiety or a history of sexual assault or child abuse

INDICATIONS FOR BREAST SURGEON REFERRAL
- Suspicion of malignancy – mass or suspicious mammogram requiring biopsy
- Confirm benign nature – patient anxiety
- Breast hypertrophy – reduction mammoplasty
- Patient requests mastectomy
<table>
<thead>
<tr>
<th>Treatment</th>
<th>Response Rate, %</th>
<th>Dose</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reassurance</td>
<td>70-85</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Well-fitted brassiere</td>
<td>75</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Caffeine reduction</td>
<td>Conflicting results: 0-65</td>
<td>N/A</td>
<td>Withdrawal headaches</td>
</tr>
<tr>
<td>Low-fat diet</td>
<td>90</td>
<td>&lt;15% saturated fat</td>
<td>None</td>
</tr>
<tr>
<td>Relaxation Therapy</td>
<td>61</td>
<td>Daily</td>
<td>None</td>
</tr>
<tr>
<td>Hypnosis</td>
<td>100</td>
<td>Frequency not reported</td>
<td>None</td>
</tr>
<tr>
<td>Evening Primrose Oil (gammalinolenic acid</td>
<td>Conflicting results</td>
<td>No improvement with 3gm po</td>
<td>Nausea, stool softening, abdominal pain indigestion, flatulence</td>
</tr>
<tr>
<td>supplement)</td>
<td></td>
<td>qd</td>
<td></td>
</tr>
<tr>
<td>Diclofenac gel (topical)</td>
<td>CM 47-87</td>
<td>Apply to affected areas up to 4 times per day.</td>
<td>None reported. Local skin irritation or eruption possible.</td>
</tr>
<tr>
<td>Tamoxifen (estrogen agonist/antagonist)</td>
<td>Overall 86-90</td>
<td>10 mg po qd 15th-25th days of cycle x 3 months</td>
<td>Common: hot flashes, fluid retention, vaginal discharge, nausea, irregular menses, weight loss Serious: cataracts, stroke, endometrial cancer, pulmonary embolism, deep vein thrombosis</td>
</tr>
<tr>
<td>Danazol (antigonadotropin)</td>
<td>CM 70-79</td>
<td>Begin 100mg po bid on 2nd day of menses for 2 months, ↓ 100mg po for 2 months, ↓ to 100mg po days 14-28 or qod if amenorrheic for 2 months, then discontinue.</td>
<td>Common: irregular menses, weight gain, rash, headache, nausea, edema, virilism, muscle cramps, decreased breast size, acne, depression Serious: intracranial hypertension, Stevens-Johnson syndrome, cataracts, peliosis hepatitis, pancreatitis, carpel tunnel, polyneuritis</td>
</tr>
<tr>
<td>Bromocriptine (prolactin inhibitor)</td>
<td>CM 47-77</td>
<td>Begin 1.25mg po qhs. Increase of 1.25mg increments over 2 weeks until 2.5mg bid for 2 to 4 months.</td>
<td>Common: nausea, emesis, postural hypotension, headaches, fatigue, constipation, anorexia Serious: visual disturbances, hallucinations, dyskinesias, seizures, stroke, MI</td>
</tr>
<tr>
<td>Depo-Provera (medroxyprogesterone)</td>
<td>Pain frequency: Users 9% Controls 21%</td>
<td>150mg IM q 3 months</td>
<td>Irregular menses, decreased libido, weight gain, depression, galactorrhea, rash</td>
</tr>
<tr>
<td>Goserelin (luteinizing hormone releasing hormone analogue)</td>
<td>Overall 81</td>
<td>3.6mg SQ q4 weeks</td>
<td>Common: hot flashes, headaches, nausea, emesis, vaginal dryness, loss of libido, joint pains, depression, reduced bone mass</td>
</tr>
</tbody>
</table>
Breast Pain Severity

Mild/moderate

Reassurance
Well-fitted bra
Caffeine reduction
Low-fat diet
Relaxation therapy
Oral nonsteroidal antiinflammatory drugs

Reassess at 3 months with breast pain diary

Improvement

Same as mild/moderate +

No Improvement/
Worsening

Primrose oil capsules

Reassess at 3 months with breast pain diary

Improvement

No improvement/
Worsening

Consider topical
diclofenac, tamoxifen,
danazol,
bromocriptine (cyclical)

Imbalance

No improvement

Reduce dose
Stop after 3 – 6 months

Reassess
Consider 2nd line agent

Figure 4. Algorithm for the Treatment of Breast Pain
BREAST PAIN CASES

Frances Norlock, DO, MPH
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Reference

CASE 1

A 25 year old white, female presents with breast pain 5-7 days before her menses for more than 6 months. The clinical breast exam is normal.

What validated questionnaire can the provider use to assess the degree of pain, its effect on the patient’s quality of life, medications tried, and association with other chronic pain conditions? What additional questions would you ask?

The Present Pain Index and Quality of Life Questions (see Fig. 1):
She rates her pain a 3 “distressing”, states it does interfere with her sleep and sexual activity, and that she has tried ibuprofen without relief. In addition, she also suffers from intermittent abdominal and low back pain.

Additional questions:
- quality of pain (sharp, dull)
- location of pain (b/l, UOQ’s, focal)
- presence or absence of a mass on SBE
- exacerbating factors - oral contraceptives, pregnancy, caffeine intake, tubal ligation, trauma, high fat diet
- other medical problems - PMS, DM, HTN, CAD, GERD, cervical radiculopathy, pulmonary disorders

Her breast pain is a dull, heavy ache bilaterally “all over” but mainly in the UOQ’s. She denies having a breast mass or breast trauma, has had her period this month, does not take birth control pills, drinks 3-4 cups of coffee per day, has no other medical problems, but has a diet high in saturated fat.

2) How would you classify the type and duration of this patient's breast pain?
Cyclical breast pain

3) Due to her other chronic pain conditions, what other questions should you ask?
Rule out symptoms of depression or anxiety.
Rule out a history of sexual assault or child abuse. Both have a relationship with other chronic pain conditions (back pain, abdominal/pelvic pain, headaches, arthritic pain, fibromyalgia). These chronic pain conditions have also been associated with breast pain.
Therefore, patients should be asked about exposure to sexual assault or child abuse. A direct relationship between breast pain and a history of sexual assault or child abuse has not been studied.

Except for irregular sleep habits, which the patient attributes to breast pain, she denies symptoms of depression or anxiety but reports that she was sexually assaulted in college at a party when she was 20 years old.

4) **Is diagnostic imaging indicated?**
In the absence of a discrete lump or localized nodularity, ultrasound is unlikely to yield any information of clinical value. No diagnostic imaging is recommended in a patient under 40 years of age who presents with classic cyclical mastalgia and a normal exam. If a young women <35 y/o is very anxious regarding her breast pain some physicians do order a breast ultrasound to reassure the patient.

The use of mammography has been investigated among patients who presented with breast pain as their primary complaint. In patients older than 40, malignancy was found at a higher rate than that found by reported screening programs. No cancers were detected in women <40 years old. Therefore, women 40-49 y/o who present with breast pain and no palpable mass should have a mammogram.

5) **The patient is very anxious about her breast pain being a sign of breast cancer. What do you tell her?**
“Breast cancer can occur in women of any age, however, only 2% of women with breast pain alone have breast cancer. Although this is double the rate of that seen in an asymptomatic screening population (1%), breast cancer is much more common in older women (>40y/o).”

6) **What treatment would you recommend at this initial visit?**
Mild/Moderate Pain (see Table 3):
- **Reassurance** (70%-85% effective): “Breast pain is very common.” “Without a breast mass it is rarely a symptom of breast cancer.” “Most patients with breast pain need no specific treatment.” “It tends to be intermittent and becomes less frequent with age.”
- **Lifestyle changes**: well-fitted brassiere, caffeine reduction, low-fat diet
- **OTC pain relievers**: ibuprofen or naprosyn

Severe pain: add primrose oil capsules for 3-6 months ($$, 1.5gm bid)

Not effective: vitamin E, vitamin B6, diuretics

The relationship between sexual assault and other chronic pain conditions should be explained to the patient. A telephone number for victims of sexual assault should be provided to see if exploring this issue helps improve the patient’s constellation of chronic pain symptoms.
7) What can the patient do at home to help tailor her treatment at her return visit? The patient should keep a daily breast pain diary using the Visual Analog Pain Scale (VAPS) (see Fig. 2) to assess the magnitude of breast pain, to determine whether the pain is truly cyclical or noncyclical, and to review the use and effectiveness of OTC pain relievers. “Clinically significant cyclical mastalgia” = score of 3.5 for 5-7 days before menses (arbitrary cut-off).

8) When would you have her return for her first follow-up visit? What about future follow-up appointments? The first follow-up visit should be in 2-3 months for a repeat CBE to confirm the absence of a breast mass not detected at the initial visit and to review the breast pain diary. If pain has improved she should be reexamined every 4-6 months for 1 year. After 1 year of follow-up a patient should return to routine screening appropriate for their age.

If pain has not improved on primrose oil capsules a trial of bromocriptine, tamoxifen, or topical diclofenac may be given. See Table 3 for dosing and side effects. In light of the patient’s other chronic pain symptoms, gabapentin or amitriptyline may also be tried.
CASE 2

A 45 year old African-American female presents with a seven month history of persistent, right, lower, inner quadrant (RLIQ) breast pain just beyond the areola. This is the third time you are seeing her in six months. She states that the pain is not getting worse, however she has tried evening primrose oil and naprosyn for the past six months without relief.

Her diagnostic mammogram 4 months ago was negative for suspicious densities or calcifications, and an ultrasound of the RLIQ was subsequently normal. She had a total abdominal hysterectomy and bilateral salpingo-oophorectomy last year for uterine fibroids, does not take hormone replacement therapy and denies a breast mass or nipple discharge on SBE. Your breast exam for a third time is within normal limits without any discrete mass or asymmetry, nipple discharge or skin abnormalities. There are also no identifiable trigger points.

1) How would you classify the type and duration of this patient's breast pain?
   Noncyclical breast pain

Depending upon severity, what pharmacological treatments are available?
   See Table 3 and Figure 4.

   Mild/Moderate Pain: reassurance, lifestyle changes (well-fitted bra, caffeine reduction, low-fat diet), oral NSAID's, relaxation therapy, hypnosis
   Severe Pain: add primrose oil capsules ($$, 1.5gm bid)
   prescription medications: <10% of all breast pain patients
   Not effective: bromocriptine, vitamin E, vitamin B6, diurectics

What are the most effective prescription medications for noncyclical breast pain?
   How are they dosed and what are their side effects? How long is the treatment duration?
   Tamoxifen and topical diclofenac gel (see Table 3 for dosing and side effects). If pain improves reduce dose and discontinue after 3-6 months. If no improvement then reassess (repeat CBE, mammogram if > 6 months) and try 2nd line agent (danazol).

When would you consider a referral to the breast surgeon?
   Confirm benign nature – patient anxiety
   Suspicion of malignancy - associated mass, mammogram abnormal requiring biopsy
   Reduction mammoplasty for pain due to breast hypertrophy
   Patient request for mastectomy (psychiatric assessment first; surgical intervention may damage body image without achieving pain relief).
Breast Infection Cases

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Harvard Medical School, Beth Israel Deaconess Medical Center

Case 1

At the end of the day, you agree to see an "add-on"—a 32-year-old woman who walked into clinic asking for an emergency appointment because she "feels a lump" in her breast, has new onset nipple discharge and is terrified that she has breast cancer. She has noticed the lump for 1 month; initially, she thought it was just "a pimple", but it has subsequently grown in size and become more painful. The nipple discharge started 1 week ago: it is thick and green and stains her bra daily. Her past medical history and family history are unremarkable. She takes no medications. She is G0P0, menarche age 9, LMP 1 week ago. She is sexually active with one partner, uses condoms, smokes 1 pack of cigarettes a day for the last 15 years, drinks a bottle of beer or a glass of wine daily, and uses no street drugs.

Visual inspection reveals a 1.5 X 1.5 cm periareolar mass with overlying erythema on the lateral aspect of the right breast. The right nipple is slightly flattened, but not quite retracted. On palpation, the mass is tender and warm. With minimal pressure on the mass, purulent greenish-yellow discharge is easily expressed from a single duct. Two small, < 1 cm smooth, soft, mobile lymph nodes are palpable in the right axilla. The left breast exam is unremarkable.

1. What is your working diagnosis?
2. How common is it for young women to get non-lactational infections?
3. What are the risk factors for developing periductal mastitis?
4. What is the treatment for periductal mastitis? For non-lactational abscess? For mammary duct fistula?
5. What considerations would be important if this patient was breast-feeding?
Answers:

1. History should inquire about the same items as in Cases 1 and 2. In addition, it is important to ask about previous lumps, discharge, or biopsies, how long the current mass has been present, and whether or not it has changed in size.

   This patient has a non-lactational periareolar infection, with an underlying periductal mastitis and probable abscess but no evidence of a mammary duct fistula.

2. Periductal mastitis is a disease of young women; mean age of occurrence is 32. In one study, women with periareolar inflammation, non-lactational abscess and mammary duct fistula had a median age of 33, 35, and 37 respectively.

3. Smoking has been strongly associated with periductal mastitis. In one study, approximately 90% of patients identified as having clinically or pathologically diagnosed periductal mastitis were current smokers. Smoking may damage the subareolar ducts either as a direct toxic effect or as an indirect effect on hormones or blood flow, and the lesions may then become infected. Previous episodes of peri-areolar inflammation also increase the risk of subsequent infections.

4. Anaerobic bacteria have been identified as the major pathogens in periductal mastitis; antibiotic treatment with a penicillin or first-generation cephalosporin plus metronidazole is recommended. Treatment should be continued for 4-6 weeks and patients should be closely followed clinically. Generally, patients should be seen every week until evidence of improvement is seen, and then every 2 weeks thereafter until resolution. If there is an associated abscess, then aspiration plus antibiotics are recommended. This can be done either by FNA or surgical I & D. Some patients may require multiple FNA’s to continuously drain the abscess. If a mammary duct fistula has already developed either spontaneously or following incision and drainage of an abscess, then treatment is surgical. Either the fistula tract can be opened and left to granulate or the fistula and affected ducts can be excised. The latter approach offers a better cosmetic result since the wound can be closed primarily.

5. The combination of a penicillinase-resistant penicillin and continued breast-feeding will promptly result in resolution of the infection in 96 percent of cases.
Case 2

A 20 year old woman with no significant PMH arrives to your breast clinic with complaint of a tender breast mass, present for 2 weeks. She describes the gradual enlargement of what started out as “a pimple” on her right breast that increased in size and now is very tender to touch. She states that it hurts so much that she cannot even wear her seatbelt comfortably while in a car.

Exam reveals a slightly obese woman with moderate facial acne. Breast exam shows a 2 cm superficial nodule on the medial aspect of the right breast. There is associated erythema, induration, and and tenderness overlying the nodule. There is no axillary lymphadenopathy but there are several healed scars from prior boils in the axillary regions.

1. What other history would be useful in making this diagnosis? What is your diagnosis?

2. What is treatment regimen would you recommend?

Answers:

1. This patient most likely has hidradenitis suppurativa, which can commonly present with lesions on the breast. Hidradenitis suppurativa refers to a chronic, suppurative, cutaneous process that results from occlusion of follicles and secondary inflammation of apocrine glands. Recurrent lesions develop in the axillae, groin, vulva, and perineal or perianal areas. The most likely mechanism responsible for the development of HS is occlusion of the hair follicle. Chronic infection and draining abscesses lead to scarring of the affected sites. The incidence is as high as 1 in 300, with no racial predilection.

2. Initial treatment can begin with topical clindamycin (1 percent lotion twice per day for three months). Systemic therapy with tetracyclines (500 mg twice per day for three months) is another option, as well as isotretinoin. Often, sinus tracts must be surgically de-roofed in order to reduce the risk of recurrence. In addition, some clinicians recommend discontinuing oral contraceptive pills with highly androgenic progestins in favor of ethinyl estradiol/drospirenone (Yasmin), combined with the antiandrogenic action of spironolactone 50 to 100 mg at bedtime.
Goals and Objectives:

1. Discuss the incidence of nipple discharge, and the likelihood that a woman presenting with nipple discharge has breast cancer
2. Review the causes of nipple discharge, and basic features of the history and physical exam that distinguish “physiologic” (often caused by systemic hormone changes) from “pathologic” discharge (caused by localized breast pathology)
3. Review the evaluation and management of “physiologic” discharge, including work-up and treatment of hyperprolactinemia
4. Review the evaluation and management of “pathologic” discharge, including the roles of nipple fluid cytology, breast imaging, surgical referral, ductography, and terminal duct excision
5. Discuss the evaluation of nipple retraction and nipple inversion

Selected References:


Nipple Discharge Cases

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Introduction
After a busy morning seeing inpatients, you log on to the computer to preview your afternoon clinic schedule. As you scan the list of patients and reasons for their visits, you notice something curious: two women coming for urgent appointments have the same complaint: nipple discharge.

1. How common is nipple discharge?

2. What are the causes of nipple discharge? How is nipple discharge characterized?

3. What is the likelihood that a woman presenting with nipple discharge has breast cancer?

4. What historical information can help you differentiate the types of nipple discharge?

5. What are some of the distinguishing features on physical examination can help differentiate the types of nipple discharge?

Case 1
Your first patient is a 33-year-old G2P2 woman who continues to have bilateral milky discharge from both nipples one year after weaning her youngest child. The discharge is only apparent when she squeezes her nipples. For the last 6 months, her periods have been erratic; she does not recall the date of her LMP. She is sexually active and uses condoms for contraception. She denies fever, breast pain or mass, visual or other focal neurologic symptoms. She takes a tricyclic antidepressant which her psychiatrist is considering weaning, since she is psychologically stable and troubled by weight gain and constipation. She uses marijuana and drinks alcohol occasionally. Family history is unremarkable.

On exam, visual fields and thyroid are normal. Her right breast is larger than the left (stable since puberty), no skin changes are evident, and both nipples are everted. No masses are palpated. Milky nipple discharge is expressed from the ducts draining each quadrant; hemoccult testing is negative. No axillary or supraclavicular nodes are felt. Neurologic exam is normal.

1. How would you characterize her discharge?

2. Are any aspects of her history and physical examination worrisome?

3. Would you recommend any testing at this point? If so, what tests would you order?
Serum prolactin is mildly elevated (50 ng/ml). All other labs are normal.

1. What is the most likely cause of her nipple discharge?
2. How would you manage her at this point? What follow-up would you recommend?
3. What are the indications for head CT or MRI scanning? For medical treatment (with a dopamine antagonist)? For referral to an endocrinologist or neurosurgeon?

Case 2
Your second patient is a 62-year-old African American woman who has noticed staining on her bra or nightgown near her left nipple for four months. The color was initially clear, but has turned reddish-brown. The problem has increased in frequency from once/month to 2-3 times/week. PMH, FH, and SH are non-contributory.

On visual inspection, her breasts are symmetric without skin dimpling and her nipples are everted bilaterally. On palpation, there is no axillary adenopathy, and neither breast has a dominant mass. No nipple discharge is present on the right, but dark reddish-brown fluid is easily expressed from her left nipple. The discharge originates from one duct that drains the upper inner quadrant.

1. How would you categorize her discharge, and what are your concerns?
2. What if instead of having spontaneous reddish-brown nipple discharge, she had thick multicolored, spontaneous nipple discharge and associated nipple retraction?
3. What is your diagnostic approach?
4. What about ordering a ductogram/galactography? What is it? What are the benefits and limitations?
5. What would you do if:
   a. The hemoccult was (+), cytology was (-), and mammograms were normal?
   b. The hemoccult was (+), cytology was (-), and mammogram of the left breast showed an 8mm spiculated density at 11 o'clock?
   c. The hemoccult was (+), cytology was (+), but mammograms were normal?
   d. The hemoccult was (+), cytology was (-), mammograms were normal, but you felt an 1 cm nodule in the L UIQ at 11 o'clock?
Evaluation and Management of Women at Increased Risk for Breast Cancer

Pamela Ganschow, MD
Cook County Hospital, Rush University

Goals and Objectives

1. Become familiar with the use and limitations of the currently available prediction models for breast cancer risk assessment
2. Be aware of red flags in the family history that should alert a physician to consider genetic counseling for a hereditary breast cancer syndrome
3. Discuss the effectiveness, risks and benefits, and acceptability of the different management options (surveillance, chemoprevention, prophylactic surgery) for patients at various risk levels
4. Briefly discuss potential future risk assessment and risk reducing options including the ongoing chemoprevention trials (STAR, MAP.3, IBIS-2)

Selected References


Resources

Gail model (modified): The Breast Cancer Risk Assessment Tool at the NCI website.
http://bcrp.nci.nih.gov/brc/ (also easily accessed by typing “breast cancer risk assessment tool” into google).

Genetic Counseling: NCI website: http://cancer.gov/search/genetics_services/ or Gene Clinics website: http://www.geneclinics.org. These sites allow a search for genetics counselors by name, location and/or type of cancer/syndrome that counseling is needed for.


Evaluation and Management of Women at Increased Risk for Breast Cancer Cases

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Case 1
Mary is a 40 year old obese Caucasian woman who comes in for a new patient visit in need of preventive care. She is concerned about her risk for breast cancer because her mother had breast cancer at age 50. She is otherwise well, does not smoke, and drinks 1 glass of red wine per day. She is not married and has never been pregnant. She began menstruating at the age of 15 and has regular periods now. She has never had a mammogram or any breast problem in the past.

1. Is she at increased risk for breast cancer? What breast cancer risk factors does she have?

2. What breast cancer risk prediction models are available to calculate her risk? Which model is most appropriate for use in this patient?

3. Based on this model, what are her short term and lifetime risks based on this model? How would you explain these risks to her?
   a. How do these risks change with age?
   b. How do these risks change with different race/ethnicities?
   c. How would these risks change if she had a breast biopsy?
   d. How would her risk change if she also had a maternal aunt with breast cancer (age 60)? Paternal aunt with breast cancer (age 60)?
   e. Which risk prediction model would be appropriate for calculating her breast cancer risk now?

4. Does she have risk factors that are not included in these models? What risk factors does she have that are potentially modifiable?

5. What other management strategies should she consider for early detection and risk reduction? How effective are these in reducing her risk for breast cancer?

6. What are the side effects associated with the currently available chemoprevention options? What alternative options may be available in the future (or are currently available on study only)?
Case 2
Jane is a 30 year old black woman with 2 distant family members who were affected with cancer. One paternal aunt had bilateral breast cancer at age 48 and is still living now at age 60. The daughter of this aunt (Jane’s cousin) died of ovarian cancer at age 38. Jane sees you in clinic concerned about her risk for cancer. She is otherwise well. She is married and has 2 daughters aged 3 and 5.

1. Is she at increased risk for breast cancer? What breast cancer prediction model would be appropriate to calculate her risk?

2. In general, what are the red flags in a family history that should raise concern for a hereditary breast cancer syndrome? What gene mutations are most commonly responsible for these syndromes?

3. What are the lifetime cancer risks associated with these mutations?

4. What surveillance/screening regimens and risk reduction options should be considered by patients who carry one of these deleterious mutations?
   - Breast?
   - Ovarian?
   - Other cancers?

5. If a patient/family is identified as a possible mutation carrier, how/where should she/they be referred for testing?

6. If Jane and her family decide they want to undergo genetic testing, who should be tested first?
   a. If that person’s test is negative, should other family members be tested? What can you tell them about their breast cancer risk?
   b. If that person’s test is positive, and other family members test negative, what can you tell them about their breast cancer risk?
   c. If Jane’s aunt refuses to be tested and Jane undergoes testing with a negative result, what can you tell her about her breast cancer risk?