



BREAST LUMPS AND ABNORMAL MAMMOGRAMS

INTRODUCTION — Patient complaints of breast lumps are common in primary care practice. In one study, 16 percent of women ages 40 to 69 sought physician advice about breast complaints over a 10-year period for a rate of 23 visits per thousand woman years; in 40 percent the complaint was for a breast lump or lumpiness. Breast lumps are serious because of the threat of breast cancer, especially in women over age 40. Breast cancer was found in 11 percent of women complaining of a lump (and 4 percent of women with any breast complaint) in the above study. This compared with breast cancer occurring in 8 percent of abnormal screening mammograms and 2 percent of abnormal screening clinical breast examinations in the same population. Thus, clinicians should pursue to resolution all breast complaints and abnormalities, regardless of the mode of presentation.

The vast majority of breast lumps and breast complaints are caused by benign breast disease, even in referral practices. In one breast clinic, breast cancer accounted for 10 percent of breast complaints in referred patients; the most common conditions were cysts and fibroadenomas.

DIAGNOSTIC EVALUATION — Breast lumps can present as lesions that can be felt by the patient or the clinician (palpable), or as non-palpable lesions first detected on screening mammography. The evaluation of palpable and non-palpable lesions differs slightly, as discussed below. Primary care clinicians are involved in the beginning evaluation of breast lumps, but often are no longer the principal physician involved once radiologic and invasive procedures are necessary.

The initial step in the assessment of breast lumps is the history and physical examination. The majority of women will need further testing; the most useful tests are mammography, ultrasound, fine needle aspiration, and core needle biopsy. The "gold standard" test is histologic examination of the excised lump, although rare false-positive results can occur even with open biopsies. The challenge is to be as sure as possible that the breast lump does not contain cancer while at the same time minimizing the invasiveness of the biopsy procedure; 75 to 80 percent of the 500,000 breast biopsies performed in the United States each year are for benign lesions.

History and physical examination — A careful history in women with a breast lump includes:

- The precise location of the lump
- How it was first noted (accidentally, by breast self-examination, or during a screening clinical breast examination or mammogram)
- If and how long the patient has noted its presence

- Whether there is any accompanying nipple discharge
- Whether the lump has changed in size
- Whether the lump waxes and wanes in size at particular times in the menstrual cycle. Benign cysts may be more prominent premenstrually and regress in size during the follicular phase (just after menses).

Physicians should also ask about a past history of breast cancer or breast biopsy (especially one showing atypical hyperplasia), and a history of risk factors for breast cancer (eg, age, family history of breast cancer, age of menarche, age at first pregnancy, age of menopause, alcohol use, and hormonal replacement therapy, ([show table 1](#))). Older age ([show table 2](#)), previous history of breast cancer, and family history in a first degree relative have all been shown to increase the chance that a palpable breast lump is cancerous on biopsy [[6](#)].

Breast tissue in normal women is often lumpy. Thus, the physical examination should concentrate upon those factors that may help to differentiate palpable lumps that are breast cancer from benign lesions. A number of "classic" characteristics of cancerous lesions have been described:

- Single lesion
- Hard
- Immovable
- Irregular borders
- Size ≥ 2 cm

The Canadian Steering Committee on Clinical Practice Guidelines for the Care and Treatment of Breast Cancer suggests certain other symptoms and physical findings to note when evaluating a breast lump:

- Smooth, well-demarcated lumps are usually benign, according to experts (actual evidence is not available).
- Although usually painless, breast cancer can be accompanied by pain. In one study, almost 13 percent of symptomatic cancers were associated with discomfort.
- Nipple discharge is uncommon in cancer and, if present, is unilateral. In two separate studies 14 percent of cases of unilateral nipple discharge were due to breast cancer.
- Careful examination of the axillae (area near the underarm) and supraclavicular (area over the collar bone) area for lymph node involvement is necessary.

Studies that have examined the usefulness of the physical examination for diagnosing benign versus malignant breast lumps have found that clinicians can often make the right diagnosis, but not to a degree that is sufficiently reassuring to

the physician or patient. In one report from a study of symptomatic women, for example, when experienced examiners diagnosed "definite cancer" on palpation, they were correct in 93 percent of cases. In another series of referred patients, the physical examination had a positive predictive value of 73 percent and a negative predictive value of 87 percent.

Thus, while the history and physical examination are important first steps in the assessment of breast lumps, the evaluation does not stop there. The next step may range from careful follow-up to ultrasound, mammography and/or biopsy depending upon the findings on the history and physical examination, patient age and preferences, and the local expertise of surgeons, radiologists, and pathologists.

Mammography — Diagnostic mammography is recommended as part of the evaluation of any woman age 35 or older who has a breast mass, primarily to search for other lesions that are clinically occult (small and often not recognized), but also to evaluate the mass in question. Certain mammographic features suggest malignancy:

- Increased density
- Irregular margins
- Spiculation
- Accompanying clustered irregular microcalcifications

The more suspicious a diagnostic mammogram, the higher the chance of breast cancer.

However, mammography usually cannot determine whether a lump is benign (not cancerous). In addition, mammography misses 10 to 20 percent of clinically palpable breast cancers. Thus, a negative mammogram should not stop further investigation if a suspicious lump is felt on clinical examination.

Diagnostic mammography usually is not ordered routinely in women under age 35. The breast tissue in younger women is often too dense to evaluate the lump, and breast cancer is too rare to search for it elsewhere in the breasts. In one retrospective review, routine initial mammography in 1908 women under the age of 35 who had breast symptoms or findings did not change the diagnosis or clinical management of any of the women who were eventually diagnosed with invasive cancer. The authors concluded that routine mammography is not cost-effective nor clinically beneficial for this younger group with breast complaints unless there is a high suspicion of cancer by clinical examination.

Ultrasonography — Ultrasonography can determine whether a breast mass is a simple or complex cyst or a solid tumor. It is most useful in the following circumstances:

- In women under age 35
- When a mass detected on screening mammography cannot be felt

- When the patient declines aspiration of a mass
- When the mass is too small or deep for aspiration

The risk of cancer is low if the lesion is a simple cyst on ultrasound; one study found no malignancies in 223 cysts.

Experts differ in their recommendations for women with palpable masses. Some recommend ultrasonography in conjunction with mammography in women over age 35 and ultrasound alone in women under age 35, while others recommend skipping ultrasonography altogether and moving straight to fine needle aspiration.

The negative predictive value (if the tests is negative there is really no cancer) of mammography and breast sonography in this setting was over 97 percent. (

Fine needle aspiration biopsy — Fine needle aspiration biopsy (FNAB) can be useful in determining if a palpable lump is a simple cyst. It is inexpensive, easy to perform (in skilled hands), requires no advanced preparation, and can be carried out in the office. To aspirate a palpable, suspected cyst, the mass is stabilized between the fingers of one hand and a 22 to 24-gauge needle is inserted with the other hand. Local anesthesia may be used but is not always required.

FNAB is especially valuable in evaluating cystic breast lesions and can be therapeutic if all of the fluid is removed. There are three possible scenarios with FNAB:

- Fluid that is obtained and is not bloody does not need to be sent for analysis. In one study of 6,747 consecutive cases of cyst aspirates without blood, there was not a single case of breast cancer. The mass should disappear with the removal of fluid and the patient can be reassured and checked in four to six weeks to ensure that the cyst has not reappeared; a recurrence suggests the need for surgical referral.
- Bloody fluid from patients with otherwise benign examinations should be sent for pathological analysis; cancer is found in approximately 7 percent of such cases.
- When no fluid is obtained and the mass turns out to be solid, cells can be obtained for cytologic analysis with fine needle aspiration biopsy (FNAB) by aspirating cells from the solid mass.

FNAB is operator dependent. A review of 31,340 FNABs showed that the sensitivity and specificity of the procedure varied widely (65 to 98 percent and 34 to 100 percent, respectively). This wide variation was in part due to marked differences in operator and cytopathologist expertise.

Core needle biopsy — A core needle biopsy is different from FNAB; a larger needle is used with the former (14 to 18 gauge, compared with 21 gauge), thereby providing histologic material and not requiring special cytopathologic expertise for interpretation. Because it obtains surrounding tissue, core needle biopsy is useful in distinguishing atypical hyperplasia and ductal carcinoma in situ from invasive disease. Core needle biopsy is used most often for evaluating non-palpable breast lumps in conjunction with either stereotactic mammographic equipment or ultrasound guidance.

Triple diagnosis — Triple diagnosis refers to the concurrent use of physical examination, mammography, and skilled FNAB for diagnosing palpable breast lumps. Very few breast cancers are missed using triple diagnosis. In one review of the literature, for example, only 3 of 457 (0.7 percent) women had breast cancer when all three tests suggested benign lesions, while 99.4 percent of women in whom all three tests were positive had breast cancer. In a second report, triple diagnosis was more cost-effective than subjecting all women with a palpable breast lump to open biopsy. FNAB saved over \$700 at the cost of a 0.1 percent decrease in overall 10-year survival.

The following scenarios occur with the triple diagnosis approach:

- Women in whom all three tests suggest benign disease are followed with thorough physical examination every three to six months for one year to make sure the mass is stable or regresses.
- Women in whom all three tests suggest malignancy are referred for definitive therapy.
- Women with any one of the tests suggesting malignancy undergo excisional biopsy.

RECOMMENDATIONS — A patient complaint of a breast lump must be taken seriously, and the clinician should follow the patient closely until satisfactory resolution.

In general, the older the woman, the more aggressive the evaluation since breast cancer incidence increases with age. Furthermore, older women are more likely than younger women to delay presenting with a breast complaint. Nevertheless, younger women with breast lumps are still at far greater risk for cancer than asymptomatic women in the same age group.

Women younger than age 35 — In younger women, breast lumps are almost always palpable because screening mammography is rarely performed. Diagnostic mammography is usually not helpful in women under age 35 because the breast tissue is too dense for the mammographer to read clearly. In a series of over 4,000 women age 35 or younger who had palpable breast masses, routine mammography did not alter the clinical management.

In a young woman with no physical findings indicating malignancy, it is reasonable to ask that the patient return 3 to 10 days after the next menstruation begins to determine if the lump regresses.

- FNAB can be performed if the lump remains easily palpable and feels cystic (round, smooth, and not hard) and the patient wants quick resolution of the issue. FNABs are usually performed by surgeons, but primary care clinicians with appropriate training can perform this procedure competently. If fluid is obtained and is not bloody and the mass disappears completely, the patient can be reassured and followed in four to six weeks to check for recurrence or reaccumulation. A recurrence suggests the need for surgical referral. Bloody fluid should be sent for cytology.

- If the lump does not feel cystic, the patient may be referred for ultrasound. If

ultrasound shows a solid mass, the patient should undergo either FNAB, core needle biopsy, or excisional biopsy, depending upon local expertise. Some experts suggest that if a solid lump is small (<1 cm in size) and is not clinically suspicious (eg, is soft, not fixed, not new, and not changing), it is likely to be a fibroadenoma and the patient can be followed with physical examination every three to six months.

Sometimes, general lumpiness rather than a distinct lump is felt. A second opinion should be sought if the primary care clinician is unsure about the presence of a dominant mass.

Women age 35 and older — Palpable breast lumps in older women can be managed similarly to those in younger women except that mammography is part of the initial work-up, which may begin with ultrasonography or a fine needle aspirate biopsy. Mammography is recommended as part of the evaluation of any woman age 35 or older who has a breast mass, primarily to search for other lesions that are clinically occult, but also to evaluate the mass in question. However, mammography usually cannot determine whether a lump is benign. In addition, mammography misses 10 to 20 percent of clinically palpable breast cancers. Thus, a negative mammogram should not stop further investigation.

Solid masses with malignant or suspicious cytology should receive definitive therapy or biopsy as outlined above. Masses that are not suspicious need careful follow-up, depending upon local specialist expertise and patient preferences. Patients should be informed that breast lumps found to be benign on both FNAB (fine needle aspiration) and mammography have about 1 percent risk of being cancer.

Abnormal mammogram — Women who have an abnormality identified on screening mammography but who do not have a palpable breast mass also require evaluation. The type of work-up depends upon the degree of abnormality seen on the initial screening mammogram categorized using the BI-RADS system (Breast Imaging Reporting and Data System), which is related to the chance of breast cancer:

- BI-RADS 0 (Incomplete): Perform spot compression and magnification mammography views or ultrasonography as soon as possible.
- BI-RADS 1-2 (benign): Routine follow-up.
- BI-RADS 3 (Probably benign): Perform diagnostic mammography of the breast that has the abnormality in six months.
- BI-RADS 4 (Suspicious) and 5 (Highly suggestive of malignancy): Tissue diagnosis is needed. Perform core needle or excisional biopsy as soon as possible.

For more information, please consult a physician.