Common Breast Complaints in Primary Care

Editor:
Tsveti Markova, MD, FAPAAP
Residency Director and Associate Professor, Department of Family Medicine and Public Health Sciences, Wayne State University School of Medicine, Detroit, MI

Contributor:
Kendra Schwartz, MD, MSPH
Professor and Associate Chair, Department of Family Medicine and Public Health Sciences, Wayne State University School of Medicine, Detroit, MI

Table of Contents

Introduction ........................................... 2
Breast Pain ........................................... 2
Nipple Discharge ................................. 5
Palpable Breast Mass ......................... 8
Summary ........................................... 11
References ....................................... 11
INTRODUCTION

Breast pain, nipple discharge, and a palpable breast mass are the 3 most common presenting symptoms related to the female breast.\(^1\) In 2561 women presenting for clinical breast examination (CBE) because of symptoms, pain and breast lump were the most common complaints among women aged younger than 41 years and women aged 41 years and older, respectively. Breast cancer was found in 11% of women over a median follow-up of 74 months. Breast pain was more frequent in patients without cancer compared with patients with cancer; however, no correlation between breast cancer and palpable mass or nipple discharge was found. In these women, risk of breast cancer was similar to the general population.\(^2\)

Many women who present with a breast symptom are concerned about whether the symptom represents breast cancer. This is a logical concern given that 1 in 8 women will be diagnosed with breast cancer over her lifetime.\(^3\) Physicians should acknowledge patient concerns about breast cancer, appropriately address symptoms, and rule out the possibility of breast cancer based on clinical presentation and risk factors (ie, age, family history of breast cancer, early menarche, presence of history of benign breast disease, older age at first full-term pregnancy, nulliparity, late menopause). This manual reviews the approach to clinical evaluation and management of breast pain, nipple discharge, and palpable breast mass.

BREAST PAIN

Mastalgia is characterized by breast pain and tenderness, with or without nodularity. Among presenting breast complaints in primary care, mastalgia is at least as common, if not more common, than finding a lump.\(^1,4,5\) Mastalgia is categorized as either cyclic or noncyclic. Approximately two thirds of women presenting with breast pain have cyclic mastalgia.\(^6\) Cyclic mastalgia is bilateral, usually present in the upper outer breast quadrants, and associated with nodularity. Pain varies in intensity throughout the menstrual cycle but is typically most severe premenstrually and subsides during menses. Cyclic mastalgia typically affects women in the third decade; however, it has been reported in postmenopausal women on hormone replacement therapy. Noncyclic mastalgia typically occurs in women older than 40 years. Pain is usually unilateral and is not temporally related to the menstrual cycle.

CASE STUDY 1

A 32-year-old woman presents to her primary care physician with bilateral breast pain. She describes the pain as deep and aching and at times so severe that she is unable to wear a bra. The pain is always present but worsens before her periods. The pain began several months ago, after she stopped breast-feeding her first child. Her mother was recently diagnosed with breast cancer, and she is concerned that the pain may be related to cancer.

- Could these symptoms represent cancer?

Many women are concerned that breast pain represents cancer. However, in a study of 987 women whose only complaint was breast pain, less than 1% of women were found to have a malignancy on mammography.\(^5\) After appropriate evaluation, the majority of patients can be reassured that the pain is not cancer-related; roughly 15% of women presenting with mastalgia will require further treatment.\(^7\)

CAUSES OF BREAST PAIN

Cyclic mastalgia is thought to be hormonally mediated. Fibrocystic changes may also play a causative role, but histopathologic studies have shown no association.\(^8\) Several studies examining levels of circulating progesterone, estrogen, or prolactin or quantity of hormone receptors as a cause of cyclic mastalgia have yielded conflicting results,\(^9,10\) although altered hormone receptor sensitivity remains a possibility. A hormonal etiology is biologically plausible; regularly ovulating women are most often affected by cyclic mastalgia, with the premenstrual week of their cycle being the most painful.
Several causes of noncyclic mastalgia have been described; their relative frequency is summarized in Table 1. Postsurgical breast pain may occur at the site of an incision, particularly if the lines of Langer have been crossed. Mondor’s disease (phlebitis of the thoracoepigastric vein) may be related to a history of breast surgery, trauma, or radiation.11 Costochondritis (Tietze’s syndrome) reportedly accounts for approximately 7% of noncyclic mastalgia cases.12 Although subclinical operable breast cancer may present as recent-onset noncyclic breast pain, pain is rarely the only presenting symptom of malignancy.5

- What elements of the history and physical examination are necessary to identify the cause of mastalgia?

**CLINICAL EVALUATION**

**History and Physical Examination**

A thorough history and physical examination is essential to classify mastalgia and determine an appropriate management strategy. Patients should be questioned regarding the effect of mastalgia on their lives. History should elicit current medication use, including current hormone replacement or oral contraceptive therapy; previous breast problems or breast-related surgery; and family history of breast problems, including cancer. Although no single history or examination component can determine if cancer is present, a finding of recent-onset noncyclic pain in a postmenopausal woman should raise concern of malignancy.13 If a dominant mass or unilateral nipple discharge accompanies mastalgia, cancer must be strongly considered and the patient managed appropriately (see Nipple Discharge and Palpable Breast Mass).

The CBE includes both inspection and palpation. Inspection of the breasts focuses on evidence of trauma or old surgical scars; both are related to noncyclic mastalgia. Whether the history is consistent with cyclic or noncyclic mastalgia, the breasts should be thoroughly palpated. Nodularity is common with both cyclic and noncyclic mastalgia, but if a dominant mass is found, the appropriate management protocol should be followed to rule out malignancy. Several causes of noncyclic breast pain can be differentiated by physical examination. For instance, pain reproduced by palpation of the costochondral junction or the lateral chest wall suggests a musculoskeletal etiology, such as costochondritis. Pain exacerbated by specific neck movements suggests cervical radiculopathy.

**Clinical Presentation**

Women often characterize cyclic breast pain as dull, aching, heavy, or sore. Pain ranges in severity from mild to severe enough to limit clothing selections, sleep positions, or hugging. Noncyclic breast pain may be constant or remitting, but pain-free intervals are not related to menses. The pain is often described as sharp, burning, or drawing and is more commonly located in the subareolar or medial portion of the breast. Non–breast-related pain may cause symptoms, such as pain radiating to the arm or axilla or pain with deep inspiration.

**Diagnostic Tests**

Diagnostic tests are not necessary unless a dominant mass is found. However, mammography should be considered in women older than 30 years, especially in cases of unilateral breast pain. In one study, only 4 of 987 women with mastalgia and no other symptoms or signs were found to have breast cancer, a number similar to that of asymptomatic women.5

- What treatment would you recommend for this patient?

After a thorough evaluation, the majority (85%) of women with breast pain (cyclic or noncyclic) will need only reassurance from the physician that the pain is not due to cancer.7 For the remaining 15% of women, additional treatment is needed. Table 2 summarizes the treatment options for mastalgia. In general, surgical intervention is not recommended for treatment of mastalgia, except in the case of a dominant mass or mammary duct ectasia. In the past, procedures such as a subcutaneous mastectomy were used to treat pain, often resulting in a painful scar.
MANAGEMENT OF CYCLIC BREAST PAIN

Nonpharmacologic Management

Objective evidence is lacking regarding the efficacy of most therapies for cyclic mastalgia. Nonpharmacologic interventions should be tried before pharmacologic therapy is considered. First, the patient should be instructed to keep a diary of the pain for a minimum of 2 months, preferably measured with a severity scale (eg, pain rated from 1–10, with 10 representing severe pain). A daily record of the severity of pain may convince the patient that the pain is cyclic and not severe enough to warrant pharmacologic treatment, especially if treatment has adverse effects. Patients should be advised to be fitted with a properly fitting bra. In an English study of 100 patients with any breast pain, 75 found relief after being professionally fitted, regardless of their age, cup size, or underlying cause of breast pain.14

Diet modification may also be helpful; however, this has not proven beneficial in randomized trials. The most common recommendations include a low fat diet (<15% of daily calories from fat) and removal of methylxanthines (caffeine has been studied the most) from the diet. Vitamin supplements E and B have also been advocated; however, there is no evidence of their effectiveness in several controlled trials, and high doses of these vitamins may have adverse effects, including increased mortality seen in randomized trials of antioxidants for coronary artery disease.15 Isoflavones also have been proposed as treatment for mastalgia. A small randomized trial of commercially available 40 mg and 80 mg isoflavone tablets was associated with a 30% to 44% reduction in cyclic pain compared with a 13% reduction in the placebo group.16 Notably, nearly 25% of women withdrew during the placebo run-in phase because their pain had improved.

Pharmacotherapy

Several medications have shown efficacy for treating cyclic mastalgia in controlled studies (Table 2); bromocriptine, tamoxifen, and goserelin (a luteinizing hormone–releasing hormone analogue) are generally not recommended because of their adverse effects. Some studies have noted a significant placebo effect, with 20% or more placebo-treated women reporting improved symptoms.17,18 There is no evidence to support the use of thyroid hormones, progesterone, diuretics, or oral analgesics in the treatment of cyclic mastalgia.

Evening primrose oil, which is rich in γ-linolenic acid, is thought to exert its effect by normalizing blood levels of essential fatty acids. In several trials, evening primrose oil has been found to be effective for relieving cyclic breast pain6,10; yet, a recent placebo-controlled trial showed no improvement in pain.19 Evening primrose oil is well tolerated and is available over-the-counter; nausea and bloating are the most common adverse effects.6 The usual dose is 3 g daily in 3 to 6 divided doses.

Diclofenac, a topical nonsteroidal anti-inflammatory gel, has demonstrated significant pain reduction compared with placebo when used on the breast skin every 8 hours for 6 months.19 A smaller uncontrolled study of diclofenac or piroxicam gel also demonstrated improvement in pain symptoms after 2 months’ use, with 81% of patients reporting satisfactory pain relief.20 There were no side effects reported in either study.

Danazol, a synthetic androgen, is the only drug approved by the US Food and Drug Administration (FDA) for mastalgia. It is thought to inhibit the midcycle luteinizing hormone surge and competitively bind estrogen and progesterone receptors in the breast. Overall, 50% to 75% of women experience improvement of cyclic pain with a danazol dose of 100 to 400 mg/day.8 The

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Treatment</th>
<th>Efficacy</th>
<th>Usual Dose</th>
<th>Comments/Adverse Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclic breast pain</td>
<td>Topical nonsteroidal anti-inflammatory gel</td>
<td>Significant improvement in pain score compared with placebo</td>
<td>50 mg diclofenac gel every 8 hr</td>
<td>No adverse effects</td>
</tr>
<tr>
<td></td>
<td>Danazol</td>
<td>70% improvement in pain compared with placebo</td>
<td>50–100 mg every 12 hr</td>
<td>Substantial adverse effects of menstrual irregularities, water retention, acne</td>
</tr>
<tr>
<td></td>
<td>Evening primrose oil</td>
<td>None to 58% pain improvement</td>
<td>1 g every 8 hr</td>
<td>Minimal adverse effects of nausea, bloating</td>
</tr>
<tr>
<td></td>
<td>Proper-fitting bras</td>
<td>75% improvement</td>
<td></td>
<td>No adverse effects</td>
</tr>
<tr>
<td>Noncyclic breast pain</td>
<td>Topical nonsteroidal anti-inflammatory gel</td>
<td>Significant improvement in pain score compared with placebo</td>
<td>50 mg diclofenac gel every 8 hr</td>
<td>No adverse effects</td>
</tr>
<tr>
<td></td>
<td>Evening primrose oil</td>
<td>None to 38% pain improvement</td>
<td>1 g every 8 hr</td>
<td>No adverse effects</td>
</tr>
<tr>
<td>Noncyclic breast pain due to nonbreast cause</td>
<td>Treat underlying problem</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Management Options for Breast Pain
recommended starting dose is 50 mg twice daily, titrated upward as tolerated to a maintenance dose of 100 mg twice daily. In a randomized trial of 100 women, danazol taken only during the luteal phase was found to be effective. Luteal phase–only dosing of danazol may be associated with fewer adverse effects (eg, water retention, acne) than continuous dosing.21

Bromocriptine, the prolactin inhibitor, has been successfully used in treating cyclic breast pain.22 The relatively high incidence of adverse effects (20%–33%), including nausea, vomiting, headache, and postural hypotension, has limited its use. Moreover, bromocriptine is no longer indicated for lactation cessation because of its association with seizures, strokes, and fatalities.

Tamoxifen has been proven effective in several studies of mastalgia.22,23 However, due to concerns regarding its effect on bone density and a possible association with endometrial cancer, it is recommended only for short-term use in the treatment of severe mastalgia and should be considered only if all other therapies have failed.

The effectiveness of goserelin for treating breast pain was evaluated in a randomized, placebo-controlled trial. Patients received either a monthly goserelin injection (3.6 mg/mo) or a sham injection for 6 months. Goserelin-treated patients experienced a 67% improvement in mean breast pain score compared with 35% in placebo-treated patients.24 However, at 6 months post-treatment, the 2 groups had similar pain scores. Numerous adverse effects are associated with goserelin injection, including vaginal dryness, hot flushes, decreased libido, oily skin or hair, and a decrease in breast size.

**MANAGEMENT OF NONCYCLIC BREAST PAIN**

Noncyclic breast pain is managed by treating the underlying cause. If the pain is localized to the breast tissue, topical nonsteroidal anti-inflammatory agents or evening primrose oil can be tried. If the pain is musculoskeletal (estimated as approximately 50% of noncyclic mastalgia cases), analgesics and/or anti-inflammatory drugs are recommended. Local injections of combination steroid and anesthetic have proven beneficial in prospective studies.25 Although evidence from randomized trials is lacking, both evening primrose oil and danazol have helped women with pain localized to the breast; danazol may be slightly more effective.9

**NIPPLE DISCHARGE**

Nipple discharge (ie, secretions from the breast[s] of a woman who is not lactating) are categorized as either physiologic or pathologic (nonphysiologic). Physiologic breast secretions are typically bilateral, involve multiple ducts, and are not spontaneous. The discharge must be expressed by either gentle massage or by a device such as a breast pump. Pathologic ductal discharges are typically unilateral; evolve from a single duct; are bloody, serosanguineous, or watery; are spontaneous or intermittent; and are often associated with a mass.

Most nipple discharge is caused by benign conditions, but it is understandably a cause for concern. Once a discharge is discovered, the anxious patient may manipulate the breast and nipple frequently to test if the discharge is still present, which may provoke more discharge. The true prevalence of nipple discharge is unknown because many women do not seek medical advice. Prevalence also depends on the examination technique; discharge will be obtained more frequently if the breasts are compressed. In a study of 2685 women undergoing a routine health examination that included breast compression toward the nipple, nipple discharge was present in 10%.26 Breast secretion may be present in as many as 50% to 70% of women if nipple aspiration by pump expression is performed.9 The significance of nipple discharge depends on the age, gravidity, parity, and menopausal status of the woman as well as the characteristics of the discharge.

**CASE STUDY 2**

A 50-year-old postmenopausal woman presents to her primary care physician with a 2- to 3-week history of thin, dark green nipple discharge from her left breast. She first noticed it as a stain in her bra. She is able to elicit the discharge by squeezing her breast toward the nipple. She denies any pain and has not felt a mass.

- **What should you tell this patient about the possible causes of nipple discharge?**

**CAUSES OF NIPPLE DISCHARGE**

Galactorrhea, a milky discharge, is the most common physiologic discharge and requires investigation for an endocrine abnormality or a pharmacologic cause if the woman is not pregnant or lactating. A more serious physiologic discharge can be medication-induced or result from frequent breast manipulation. Physiologic discharges are related to hormonal influences on breast tissue, usually hyperprolactinemia. Increased prolactin levels may be due to a physiologic or pathologic event or be pharmacologically induced; even a transient hyperprolactinemia may result in nipple discharge. Physiologic causes of hyperprolactinemia include nipple stimulation, sexual orgasm, sleep, exercise, and food ingestion. Pathologic reasons for increased prolactin levels include
Eczema, nipple adenoma, and Paget’s disease can cause differential diagnosis of nipple discharge. Pathologic discharges can originate either from the nipple and areola region or from a breast duct. Eczema, nipple adenoma, and Paget’s disease can cause erythema and ulceration of the nipple skin, with an associated bloody discharge. Ductal diseases associated with nipple discharge include duct ectasia (also known as peri ductal mastitis), duct papilloma, and early ductal carcinoma. Duct papilloma and early ductal carcinoma usually involve a single duct and cause a serosanguineous or sanguineous discharge. Duct papilloma is a benign condition of epithelial hyperplasia within the ducts. Papillomas that occur more peripherally are usually multifocal and are more likely to be breast cancer. In situ ductal carcinoma is responsible for 5% to 10% of unilateral nipple discharges. Studies of single-duct discharges and pathologic discharges report a similar cancer incidence of 10%–20.

Infection and abscess can lead to a purulent discharge. Mastitis is more common in the puerperium but can occur after weaning. Fibrocystic changes have also been associated with a nipple discharge. Table 3 outlines the differential diagnosis of nipple discharge.

- How much of the work-up can be done in the office, and what testing should be referred out to a specialist?

**CLINICAL EVALUATION**

**History**

Important points to cover in the history of a woman presenting with nipple discharge include age, whether the discharge is bilateral or unilateral, characteristics of the discharge, recent pregnancy, current medications, menstrual cycle, menopausal status, exercise and sleep habits, sexual activity, and recent surgery or trauma. Galactorrhea is more common in women of childbearing age and may occur for 1 to 2 years or longer after childbirth. Amenorrhea, headaches, visual disturbances, and changes in appetite or temperature regulation should increase suspicion for a pituitary or hypothalamic problem. History should also include medication use. The following may increase prolactin levels: phenothiazines, haloperidol, metoclopramide, reserpine, α-methyldopa, verapamil, histamine₂-receptor antagonists, opiates, amphetamines, cocaine, hallucinogens, oral contraceptives, and tricyclic antidepressants. Increased exercise, sleep, feeding (especially high-protein), sexual orgasm, nipple stimulation, and ovulation can affect prolactin secretion; recent changes in these functions or a temporal association between them and the discharge should be elicited. Complaints of breast skin changes along with nipple discharge should raise suspicion for nipple adenoma, Paget’s disease (caused by malignancy), or eczema. A colored (green, yellow, or brown), sticky, nonbloody secretion from both breasts is often attributable to...

**Table 3. Differential Diagnosis of Nipple Discharge**

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Frequency in Primary Care Office (% within physiologic or pathologic category)</th>
<th>Typical Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physiologic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Idiopathic</td>
<td>Common (40%–45%)</td>
<td>Bilateral, milky or watery</td>
</tr>
<tr>
<td>Galactorrhea</td>
<td>Somewhat common (25%–30%)</td>
<td>Bilateral, milky (prolonged lactation)</td>
</tr>
<tr>
<td>Medication</td>
<td>Uncommon (10%–15%)</td>
<td>Bilateral, milky or watery</td>
</tr>
<tr>
<td>Anovulatory syndromes</td>
<td>Rare (1%–2%)</td>
<td>Bilateral, milky or watery, irregular menses</td>
</tr>
<tr>
<td>Sella turcica lesions</td>
<td>Rare (1%–2%)</td>
<td>Bilateral, milky or watery, irregular menses</td>
</tr>
<tr>
<td>Pathologic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duct papilloma</td>
<td>Common (40%–45%)</td>
<td>Unilateral, serous or bloody</td>
</tr>
<tr>
<td>Fibrocyst</td>
<td>Uncommon (15%–25%)</td>
<td>Usually unilateral, greenish or serous</td>
</tr>
<tr>
<td>Duct ectasia</td>
<td>Uncommon (15%–20%)</td>
<td>Usually bilateral, multicolored, sticky</td>
</tr>
<tr>
<td>Eczema</td>
<td>Rare</td>
<td>Usually unilateral, bloody, crusting</td>
</tr>
<tr>
<td>Paget’s disease</td>
<td>Rare</td>
<td>Usually unilateral, bloody, crusting</td>
</tr>
<tr>
<td>Early ductal carcinoma</td>
<td>Rare (5%–10%)</td>
<td>Unilateral, serous or bloody</td>
</tr>
<tr>
<td>Infection/inflammation</td>
<td>Rare (5%–10%)</td>
<td>Usually unilateral, purulent</td>
</tr>
</tbody>
</table>


Hypothalamic lesions, pituitary tumors, chest wall trauma, hypothyroidism, renal failure (decreased prolactin clearance), and anovulatory syndromes such as polycystic ovary syndrome. Medications, including dopamine-blocking drugs (eg, phenothiazine, metoclopramide), dopamine-depleting drugs (eg, reserpine, methylidopa), and drugs that increase prolactin secretion (eg, opiates, amphetamines, verapamil) can also cause hyperprolactinemia. Thyroid-releasing hormone, serotonin, vasoactive intestinal peptide, and vasopressin are physiologic peptides that have prolactin-releasing activity.

Pathologic discharges can originate either from the nipple and areola region or from a breast duct. Eczema, nipple adenoma, and Paget’s disease can cause
mammary duct ectasia, a benign disease caused by inflammation and dilation of a terminal duct that usually occurs in postmenopausal women. A serous, watery, bloody, or serosanguineous discharge from one breast, especially in a postmenopausal woman, should raise concern for malignancy.

### Physical Examination

A complete CBE is important to determine the presence of a palpable mass, especially if discharge is unilateral. The breasts should be inspected to determine any skin changes, including retraction. Careful palpation of each quadrant of the breast is important to determine if the discharge appears to be confined to a single duct, as in ductal papilloma or carcinoma. Special attention should be paid to the subareolar region to identify the area at which pressure produces discharge and to palpate for masses. A careful CBE takes at least 5 minutes.

### Diagnostic Studies

If the history and physical examination are consistent with galactorrhea and all physiologic and pharmacologic causes have been excluded, prolactin should be assessed to rule out hyperprolactinemia. Serum prolactin should be measured fasting and 2 hours after awakening because feeding and sleep can increase the prolactin level. Physical examination can affect the prolactin level, and as a result, a prolactin specimen should not be obtained directly after a thorough CBE. For women who are experiencing amenorrhea or other symptoms indicating pituitary or hypothalamic dysfunction, prolactin and thyroid-stimulating hormone (TSH) levels should be checked to rule out hyperprolactinemia and hypothyroidism, respectively. A β-human chorionic gonadotropin test for pregnancy should also be considered. If both the prolactin and TSH levels are normal and the patient has regular menses, a diagnosis of idiopathic galactorrhea can be made and no further testing is indicated. If the patient has irregular menses or an elevated prolactin level, magnetic resonance imaging (MRI) of the posterior fossa of the brain is warranted to look for a pituitary tumor. The higher the prolactin level, the greater the chance of a pituitary adenoma; levels greater than 200 ng/mL are highly predictive of a positive finding. However, normal prolactin levels have been found in patients with prolactinomas.

Discharges that are more suspicious for cancer (ie, unilateral, spontaneous, occurring in an older woman, bloody, serosanguineous, or watery) can first be assessed with guaiac smear testing for the presence of blood, although reports are inconsistent regarding the predictive value of this test. Cancer may be detected in 53% to 100% of patients with heme-positive discharge. Fluid cytology can also be obtained, although its clinical utility is debatable. Although the specificity of cytology is high (96%–97%), the sensitivity is low (up to 45% in patients with carcinoma have normal cytology).

Thus, cytology is useful when results are positive, but negative results do not rule out malignancy. If cytology is negative and a bloody nipple discharge persists, an excisional biopsy should be performed. Cytology cannot differentiate between in situ and invasive cancer.

Surgical duct excision is the most specific diagnostic test and has traditionally been the method of choice for evaluating pathologic discharge. Galactography (or ductography), a radiographic procedure that involves injecting a radiopaque dye into a suspicious duct, may be helpful in differentiating between a benign and malignant neoplasm. An advantage of galactography is better localization of the lesion, which allows a more conservative surgical excision. However, the procedure is not always available. A newer procedure, mammary endoscopy (ductoscopy), may provide a more precise delineation of intraductal disease prior to surgery and, in the future, may allow women to avoid surgery if endoscopically normal ducts are found.

Mammography should be ordered in women whose history and CBE raise suspicion of cancer. However, the sensitivity of mammography for detecting cancer in patients with a nipple discharge varies considerably, from 13% to 90%, whereas the specificity is more than 95%. Given the potentially high false-negative rate, mammography may be best used to determine if other nonpalpable abnormalities are present, which increases the suspicion for cancer.

### Management

If the history, CBE, and discharge indicate galactorrhea, a cause for hyperprolactinemia should be sought. If an etiology for hyperprolactinemia is found, treatment should be initiated accordingly, such as a change of medication if hyperprolactinemia was medication-induced, lifestyle modification if the cause was exercise- or diet-related, or continued evaluation of a pituitary tumor if MRI was positive. When both laboratory tests and the menstrual cycle are normal, a diagnosis of idiopathic galactorrhea can be made and reassurance given. If from the tests administered (including MRI of the brain) the only abnormal result is an elevated prolactin level in a normally menstruating woman, a diagnosis of idiopathic hyperprolactinemia can be made. However, the patient should have prolactin levels monitored approximately every 3 to 4 months and be followed closely for signs or symptoms of a pituitary
tumor. If galactorrhea is bothersome or hyperprolactinemia is associated with diminished libido, amenorrhea, and infertility, a dopamine agonist can be initiated. Bromocriptine and cabergoline are approved by the FDA for treatment of galactorrhea.

If a patient has clear or bloody (serous, serosanguineous, or sanguineous) spontaneous discharges (especially unilateral) and mammography and/or galactography results are abnormal, surgical excision of the abnormal area is necessary for definitive diagnosis. Cytology can also be ordered, but given the high false-negative rate, prolonged observation based on the results is not recommended. Similarly, a decision to observe the patient should not be made based solely on results of mammography or galactography. If the discharge persists after surgical excision of the affected area, the patient should be referred for additional surgical evaluation. If a mass is palpable in a woman with a pathologic discharge, she should be treated as described below.

### PALPABLE BREAST MASS

**CASE STUDY 3**

A 39-year-old gravida 2 para 2 woman presents to her primary care physician complaining of a lump in her right breast, which she first noticed approximately 1 month ago. The patient monitors the lump daily and has not noticed a change in shape or consistency. Initially, the lump was not painful to the touch, but more recently it is minimally tender when she palpates her breast. She denies any discharge.

The patient has been healthy all of her life and does not have a family history of cancer. A previous physician told her that she had evidence of fibrocystic changes on her CBE, and the patient feels that this mass is most likely related to this previous diagnosis. She has never had a mammogram. On examination, a 1-cm mass is palpated in the upper outer quadrant of the right breast. It is firm but somewhat mobile. Axillary nodes are not enlarged. Aspiration is attempted, but no fluid is returned.

- **What is the likelihood that this patient’s breast mass represents cancer? What is the differential diagnosis for a breast mass?**

Breast cancer is the most common malignancy in women and the second leading cause of cancer death. The majority of cases present as a palpable mass, which is usually found by the patient. For this reason, most women are understandably frightened on discovering a breast mass. Among the common presenting breast complaints, breast mass ranks second to breast pain. A complaint or finding of a breast mass must always be taken seriously; the literature and lay press contain numerous anecdotal reports of missed diagnoses of breast cancer.

Because breast cancer is the most common cancer in women, palpable abnormalities found on CBE should always raise concern for malignancy. The risk of breast cancer varies considerably with age, and postmenopausal women presenting with a mass are more likely to have cancer compared with premenopausal women. A breast mass in a woman younger than age 30 years rarely (2%) represents cancer, whereas a woman aged 70 years and older with a mass has cancer more than 85% of the time. A breast mass may also be a breast cyst, fibroadenoma, fibrocystic mass, or duct papilloma. Duct papillomas typically occur in the late menstrual years and are one of the most frequent causes of nipple discharge (see Nipple Discharge). Breast cysts and carcinoma tend to occur later in life, whereas fibroadenomas and fibrocystic masses are more common in younger women. In fact, fibroadenoma and fibrocystic masses are the most common causes of a breast mass in women younger than 25 years. Table 4 outlines the differential diagnosis of a breast mass by age-group.

- **What elements of the history and physical examination increase a patient’s risk for breast cancer?**

### CLINICAL EVALUATION

#### History

All patients who present with a breast mass should be assessed for risk factors of breast cancer. Family history of breast cancer in a first-degree relative increases the risk about two- to threefold. If 2 first-degree relatives have been affected, the risk increases up to sixfold. A diagnosis of breast, ovarian, or endometrial cancer has been associated with an increased risk of subsequent breast cancer. A previous diagnosis of atypical hyperplasia on breast biopsy is also a risk factor. History of pregnancy before age 30 years as well as fewer years of menstruation is protective.

In addition, the patient should be questioned regarding nipple discharge and pain in the affected breast. Nipple discharge may accompany duct papilloma or cancer. If pain is present, the patient should be asked if it coincides with her menstrual cycle; masses associated with fibrocystic changes are often painful in the premenstrual period.

#### Physical Examination

The CBE should include inspection and palpation...
of both breasts as well as palpation of the axillary and supraclavicular lymph node regions. Skin retraction, dimpling, edema (peau d’orange), and bloody nipple discharge should raise suspicion for malignancy. If a mass is found, the opposite breast should be carefully palpated to determine if a symmetric mass is present. If a mirror-image mass or thickening is found, the risk of cancer is low.

A malignant mass is typically immobile and rock hard with irregular borders. With this finding on CBE, especially in the presence of enlarged axillary nodes, the patient should be immediately referred to a surgeon for biopsy. However, physical characteristics alone should not dictate the work-up of a breast mass. Malignant masses can resemble breast cysts (soft and well-defined) or fibrocystic masses (soft and irregular) on physical examination. Breast cancer masses are least likely to imitate fibroadenomas (smooth and mobile), although any breast mass warrants further investigation. Table 5 outlines red flags suggestive of breast cancer.

The accuracy of palpation for identifying malignant masses has been reported in several studies. Overall, results of physical examination are accurate ([true positive + true negative]/total patients) in only 60% to 80% of cases.**46,47** Additionally, agreement among experienced examiners is often poor. In a study of 4 surgeons, there was agreement on the need for biopsy in 11 of 15 masses that were subsequently found to be malignant.**48** In a premenopausal woman with a mass that does not have the typical characteristics of malignancy (ie, hard, irregular borders, immobile), reexamination of the breasts is recommended within the next month during the time of least hormonal influence (3–10 days after the onset of menses).**39** An effective office tracking system is necessary to assure that patients are not lost to follow-up; if an adequate follow-up system is not in place, the woman should be referred to a surgeon rather than told to return for reexamination.

**What are the next steps if a palpable breast mass is found?**

**APPROACH TO THE PATIENT WITH A PALPABLE BREAST MASS**

The management recommendations for the evaluation of a breast mass are consistent. A triple approach that includes CBE, mammography, and fine-needle aspiration (FNA) is recommended to minimize the number of excisional biopsies performed for benign disease as well as the number of missed cancers. Excisional biopsy is the gold standard for diagnosis of a breast mass. However, it has been estimated that if all “lumps” were biopsied, only 20% to 25% would be malignant.**49** Consequently, the triple test approach is preferred prior to excisional biopsy.

In a series of 234 patients who underwent an excisional biopsy in addition to the triple approach, all patients who had breast cancer had at least 1 positive test result. Although the specificity for the triple test was only 57%, the negative predictive value was 100%. All patients who had negative findings for malignancy in the 3 tests had benign

---

**Table 4. Differential Diagnosis of Breast Mass**

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Age-Group (yr)</th>
<th>Diagnosis (%)</th>
<th>Characteristics of the Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast cancer</td>
<td>&lt; 25</td>
<td>&lt; 1</td>
<td>Unilateral, hard, immobile</td>
</tr>
<tr>
<td>26–40</td>
<td>5–10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41–50</td>
<td>10–20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51–70</td>
<td>50–80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 70</td>
<td>&gt; 80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breast cyst</td>
<td>&lt; 25</td>
<td>1–4</td>
<td>Unilateral, soft, well-defined</td>
</tr>
<tr>
<td>26–40</td>
<td>2–5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41–50</td>
<td>10–20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51–70</td>
<td>7–12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 70</td>
<td>&lt; 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibroadenoma</td>
<td>&lt; 25</td>
<td>50–75</td>
<td>Unilateral, smooth, mobile</td>
</tr>
<tr>
<td>26–40</td>
<td>15–30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41–50</td>
<td>10–20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51–70</td>
<td>&lt; 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 70</td>
<td>&lt; 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibrocystic changes</td>
<td>&lt; 25</td>
<td>10–25</td>
<td>Bilateral, soft, irregular; change with cycle</td>
</tr>
<tr>
<td>26–40</td>
<td>30–40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41–50</td>
<td>Uncommon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>51–70</td>
<td>Uncommon*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 70</td>
<td>Rare</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duct papilloma</td>
<td>Uncommon for all ages, but most frequent at ages 30–50</td>
<td>Unilateral subareolar mass with discharge</td>
<td></td>
</tr>
</tbody>
</table>

*More frequent in women on hormone replacement therapy.

**Table 5. Red Flags Suggestive of Breast Cancer**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>Unilateral, noncyclic</td>
</tr>
<tr>
<td>Nipple</td>
<td>Unilateral; watery, serous, serosanguineous, discharge bloody; single duct</td>
</tr>
<tr>
<td>Breast mass</td>
<td>Unilateral; hard, immobile; noncystic</td>
</tr>
<tr>
<td>History</td>
<td>Postmenopausal, previous patient history of breast cancer, family history of breast cancer</td>
</tr>
</tbody>
</table>
lesions on excisional biopsy. A study of 259 women with palpable breast masses confirms these findings.

### Fine-Needle Aspiration

The first step in the evaluation of a breast mass, especially in a peri- or postmenopausal woman, is to determine whether the mass is cystic or solid. If the mass feels cystic, FNA can be performed using a 22-gauge needle and syringe by a physician comfortable with and experienced in the procedure, usually a surgeon. In 2 large studies, the sensitivity of FNA was reported at 84% and 77.7%, while the specificity was 99.5% and 99.2%.

Sensitivity and specificity largely depend on the experience of the physician performing FNA and the cytopathologist interpreting the sample. The most common reason for a false-negative result is an inadequate sample. In such cases, the procedure must be repeated or an open biopsy must be performed. Additionally, well-differentiated tumors may produce false-negative results on FNA. If there is any question of atypia, excisional biopsy should be performed. If FNA results show malignancy, treatment options can be discussed with the patient and definitive surgery can be planned.

If FNA reveals clear fluid and the mass disappears after aspiration, the patient can be reassured that the mass is most likely not cancerous. The location of the mass should be carefully documented in case of a bloody aspirate. To rule out intracystic carcinoma, bloody aspirate and any aspirate (bloody or clear) obtained from a postmenopausal woman not taking hormone replacement therapy should be sent for cytologic examination. In all cases, the patient should be rechecked 4 to 6 weeks after the initial aspiration. If the cyst has recurred, mammography and excisional biopsy are recommended. Intra- or partially cystic cancers should be suspected if the aspirate is bloody or if a residual mass persists directly after FNA. In these cases, mammography and excisional biopsy are recommended.

### Imaging

Ultrasonography can be performed to determine if the mass is cystic. However, aspiration has the advantage of therapeutically draining the cyst and providing a more expedient diagnosis. If the ultrasound shows a cyst, the cyst should still be aspirated and cytologic examination should be performed as indicated previously. In a study of 174 patients with palpable cystic masses, characteristics detected on ultrasonography that were significantly correlated with malignancy included thick wall, mural tumor, internal septae, and size greater than 3 cm.

Mammography should be obtained to evaluate for clinically occult malignancies, not to characterize the mass. Unless malignancy is strongly suspected, mammography is not recommended in women aged younger than 30 years or in pregnant women because increased breast tissue density makes interpretation difficult. In addition, the breast is more radiosensitive in younger women, theoretically increasing the risk of cancer. A negative result on mammography does not exclude breast cancer in the presence of a breast mass. An interval of 2 weeks between a mammogram and cyst aspiration is recommended because aspiration may cause a hematoma, which could confuse mammographic interpretation. Particularly in premenopausal women, mammography is more likely to yield a false-positive result rather than a true positive (ie, cancer) or a false-negative (ie, missed cancer) result.

Dynamic MRI is a new procedure that may have accuracy similar to that of the triple test; however, the triple test remains the gold standard for diagnosis.

### Biopsy

The number of women who should be referred for excisional biopsy is unknown. In addition to the components of the triple approach, the patient’s risk factors for breast cancer must also be considered. If CBE, mammography, and/or FNA are suspicious or consistent with malignancy, the patient should be referred to a surgeon for biopsy. If all 3 results are negative, the mass can be closely followed up with CBE by the same examiner every 3 months for 2 visits and again in 6 months to determine if the mass is stable. Benign breast masses may spontaneously resolve over time.

### SPECIAL CONSIDERATIONS

#### The Lactating Breast

Mastitis is a cellulitis of the interlobular connective tissue within the mammary gland. The clinical spectrum ranges from focal inflammation to systemic flu-like symptoms of fever, chills, and muscle aches. The affected breast usually exhibits a tender, erythematous, wedge-shaped swelling. Estimates of the incidence of mastitis range from 2.5% to 33% of breast-feeding women; the actual incidence is probably closer to 10%. Most cases of mastitis occur within the first 2 months postpartum. The infection is bacterial, usually caused by staphylococci; the breast skin and the infant’s mouth have been proposed as the source. The key to the management of mastitis is complete emptying of the breast, warm compresses, early antibiotics, and bed rest. The patient should be advised to continue breast-feeding if breast-feeding is stopped, the patient is at increased risk for abscess formation. If it is too painful to nurse on the
Common Breast Complaints in Primary Care

affected side, feedings should be started with the unaffected breast in order to allow the affected breast to “let down.” Antibiotic coverage of gram-positive organisms with dicloxacillin or erythromycin for at least 10 days usually controls the infection and is safe for the infant.

Abnormal Screening Mammogram

Managing mammographic abnormalities in patients with nonpalpable breast masses is a common concern among family physicians. Several groups have attempted to improve and standardize the interpretation of mammograms. The American College of Radiology has published recommendations to facilitate decision making when a screening mammographic abnormality is detected. The American College of Radiology Breast Imaging Reporting and Data System (BI-RADS) classifies lesions into 5 categories: benign, likely benign, intermediate, likely malignant, and malignant. Additional imaging studies, such as spot compression or ultrasound, may be recommended to characterize the abnormality found on the screening mammogram. If results of the screening mammogram or the additional studies are benign or likely benign, the final recommendation is either normal annual screening interval, a shorter 6-month follow-up interval, or biopsy.

An abnormal result on mammography should prompt a history and CBE if these have not already been done. If an abnormal physical finding (eg, dominant mass) is present, the patient should be managed as outlined above. A previous mammogram for comparison is very helpful. Lesions classified as probably benign have a low risk (<2%) of cancer and can be followed with mammographic surveillance every 6 to 12 months, depending on radiologist recommendations. Reports of intermediate, suspicious, or malignant lesions should be aggressively managed to obtain a final diagnosis. If a report provides ambiguous recommendations, a surgeon should be consulted.

SUMMARY

Women presenting with breast pain, nipple discharge, and/or a breast mass should be thoroughly evaluated. A detailed history and assessment of risk factors for breast cancer, CBE, and FNA or mammography, if necessary, are essential components in managing these patients. Physicians must be sensitive to the psychological impact that these common symptoms have on women. Patient concerns should be carefully addressed, and options for testing and potential complications of these tests should be discussed. Patient involvement in the decision-making process and good physician-patient communication can lead to improved compliance with management recommendations and follow-up.

REFERENCES


www.turner-white.com

Family Medicine Volume 7, Part 2 11


Copyright 2007 by Turner White Communications Inc., Wayne, PA. All rights reserved.