

Benign Breast Disorders

Michaela Onstad, MD, MPH*, Ashley Stuckey, MD

KEYWORDS

- Nipple discharge • Mastalgia • Palpable breast masses
- Adolescent breast disorders • Inflammatory breast conditions

KEY POINTS

- Pathologic nipple discharge is associated with malignancy in 5% to 15% of cases and therefore requires further evaluation.
- Breast pain is common, and in rare instances may be associated with infection or malignancy. Once these are ruled out, mastalgia is a benign condition that can be managed by avoidance of aggravating factors and use of alleviating factors.
- Palpable breast masses should be evaluated by obtaining a history, physical examination, appropriate imaging studies, and biopsy when indicated.
- There are many benign causes that can lead to inflammatory breast lesions; however, breast inflammation may also be a manifestation of malignancy.
- Screening mammograms may reveal benign breast abnormalities that are not otherwise clinically evident or symptomatic. Some require further evaluation and referral to a breast surgeon for surgical excision, whereas others may be associated with an increased risk of developing breast cancer in the future.

INTRODUCTION

Benign lesions of the breast are much more common than malignant lesions, although the actual incidence is difficult to estimate.^{1,2} These lesions represent a significant proportion of office visits to the obstetrician-gynecologist, because of either bothersome breast symptoms or abnormal imaging found on screening studies of breast cancer. It is important for the obstetrician-gynecologist to have an understanding of benign breast disease so as to appropriately evaluate and address patients' symptoms, distinguish between benign and malignant processes, determine which benign breast lesions require surgical management, and identify patients who are at increased risk of developing breast cancer.

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Program in Women's Oncology, Department of Obstetrics and Gynecology, Women and Infants Hospital, Warren Alpert Medical School of Brown University, 222 Richmond Street, Providence, RI 02903, USA

* Corresponding author.

E-mail address: maonstad@gmail.com

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The term benign breast disease encompasses a heterogeneous group of breast lesions. This article reviews common benign breast problems in the manner whereby they are most likely to be presented to the clinician. A discussion of common breast symptoms is followed by a review of benign breast processes found incidentally on imaging and biopsies.

NIPPLE DISCHARGE

As much as 80% of women will experience at least 1 episode of nipple discharge during their reproductive years.³⁻⁵ This discharge can be bothersome to patients, especially if it is copious and persistent, and can also elicit fear, particularly when it is bloody. Most nipple discharge is caused by benign conditions, although up to 15% may have an underlying malignancy³; therefore, appropriate evaluation and management is important.

Evaluation should start with obtaining a thorough clinical history. It is important to classify the discharge as unilateral or bilateral, bloody or nonbloody, and spontaneous or provoked. Spontaneous discharge is typically produced in large amounts. It can be found on the patient's clothing and is often readily apparent. Provoked discharge occurs with mechanical stimulation of the duct system, and can usually be reproduced during the physical examination.⁶ The history should also include the patient's age, the type and duration of nipple discharge, history of pregnancy and recent parturition, the presence of a palpable breast mass, any history of breast cancer or benign breast conditions, and a thorough review of the patient's current medications.⁵ A family history of malignancy, especially breast and ovary, should also be obtained.

Physical examination should include a thorough breast examination to evaluate for any palpable masses. An attempt to reproduce the nipple discharge should also be made, with particular attention paid to determining whether the discharge originates from 1 or multiple ducts of the nipple. Discharge originating from 1 duct is more concerning than flow from multiple ducts. The discharge should be tested for blood, which can easily be done using a Hemocult card. Other pertinent aspects of the physical examination include evaluation of the eyes for visual field deficits, palpation of the thyroid to evaluate for enlargement or a palpable mass, and evaluation of other secondary signs of pituitary tumor and thyroid abnormalities.⁵

At one time it was recommended that nipple discharge be sampled during examination and sent for cytologic evaluation. Recent studies have suggested that cytology of nipple discharge has poor sensitivity and specificity (16.7% and 66.1%, respectively) and does not add merit to clinical decision making.⁷ It is therefore no longer routinely recommended.

Based on the history and physical examination, an attempt should be made to classify the nipple discharge as either physiologic discharge, nonpuerperal galactorrhea, or pathologic discharge (**Box 1**). Physiologic discharge is a benign process. Patients should be reassured that approximately two-thirds of nonlactating women have a small amount of fluid secreted from the nipple with manual expression.^{8,9} These women should be advised to avoid frequently checking for nipple discharge, because repeated stimulation of the nipple will promote the production of more discharge. Physiologic discharge often resolves when the nipple is left alone. Nonpuerperal galactorrhea is caused by inappropriately elevated prolactin levels that can be secondary to medications, diseases of the pituitary or thyroid glands, renal failure, or chronic breast stimulation. Because nonpuerperal galactorrhea is not caused by breast abnormality, it is not discussed further in this article. Instead the focus here is on the workup and etiology of pathologic discharge, which is a symptom of a

Box 1**Classification of nipple discharge**

Physiologic Discharge

- Various colors (yellow, white, green, brown, blue-black)

- Does not occur spontaneously

- Originates from multiple ducts

Nonpuerperal Galactorrhea

- Milk production unrelated to pregnancy or nursing, or occurring more than 1 year after nursing

- Spontaneous or provoked

- Typically persistent

- Occasionally voluminous

- Associated with chronic breast stimulation and hyperprolactinemia

Pathologic Discharge

- Spontaneous

- Unilateral

- Typically arises from a single duct opening

- Bloody, serous, serosanguinous, or watery

- Persistent

pathologic process within the breast. Malignancy is found in 5% to 15% of patients with pathologic nipple discharge.⁸

Evaluation of Pathologic Discharge

All pathologic discharge should undergo further evaluation, which should begin with imaging studies to determine whether there is an identifiable mass or abnormality associated with the discharge. A mammogram and/or ultrasonogram should be ordered as initial steps, with biopsy performed when indicated.^{5,6,8,10} The use of additional imaging studies, such as diagnostic ductography and magnetic resonance imaging (MRI) of the breast, is controversial.^{8,10}

Diagnostic ductography involves the installation of contrast material into the duct that has been identified as producing the nipple discharge. This procedure reportedly is a technically challenging one, and requires that the duct is able to be cannulated. Morrogh and colleagues¹⁰ describe a series of 178 patients with pathologic nipple discharge who underwent ductography, 76% of whom had an otherwise negative evaluation with breast examination, mammogram, and ultrasonogram. Cannulation was successful in 84% of patients. In this series, ductography had sensitivity of 76% for detecting malignancy, specificity of 11%, and a positive predictive value of 11%. A patient with a negative ductogram (and negative mammogram and ultrasonogram), therefore, may still harbor a malignancy, and requires surgical management. Some breast surgeons are of the opinion that, despite this, ductography can be useful in identifying the location of the lesion to aid in minimizing the amount of tissue removed during surgery.⁸

The use of breast MRI for evaluation of nipple discharge is also controversial. Lorenzon and colleagues¹¹ retrospectively evaluated 38 women with pathologic nipple

discharge who underwent mammography, ultrasonography, and breast MRI before surgery. Breast MRI had a sensitivity of 94.7% for detecting malignancy and specificity of 78.9%. Three of 5 cancers that were present in this study were detected by MRI alone. The investigators concluded that MRI should be ordered in all patients with pathologic nipple discharge who have a negative mammogram and ultrasonogram. Opponents of this strategy argue that MRI carries a significant false-positive rate and is costly, and that there is limited availability of MR-guided biopsies at many centers in the United States.

At present, ultimately all pathologic nipple discharge requires a tissue diagnosis to appropriately evaluate for malignancy. When an abnormality is detected by a mammogram or ultrasonogram, an image-guided biopsy should be performed. In the setting of a normal mammogram and ultrasonogram, surgical excision should be performed, requiring referral to a breast surgeon. When a specific duct can be identified on examination, a selective duct excision can be performed to obtain a tissue diagnosis. Otherwise, a central duct excision is recommended.¹²

Papillary Lesions

Papillary lesions of the breast represent a spectrum of pathology that includes benign, atypical, and malignant lesions. Papillary lesions are more common among women between the ages of 30 and 50 years.⁸ When papillary lesions are located near the nipple, they typically present with pathologic bloody nipple discharge. However, these lesions may also be detected by abnormal imaging studies or may be found incidentally on biopsy performed for other indications.

Intraductal papillomas are benign tumors of the epithelium of mammary ducts. Approximately 50% are single lesions.⁸ These tumors can range in size from less than 3 mm up to several centimeters. Grossly they are tan or pink, tend to be friable, and are typically associated with a dilated duct. Microscopically they consist of multiple branching papillae with a fibrovascular core lined by epithelium. Surgical excision of these lesions is recommended and is generally curative.

Atypical papillomas are papillomas with atypical features found in the epithelial cells. These tumors carry an increased risk of being associated with in situ and invasive breast cancers, and should be surgically excised when diagnosed by core biopsy.¹³

Papillomatosis describes papillomas containing ductal hyperplasia without atypia (proliferation of the ductal epithelial cells). Juvenile papillomatosis is a disease described in women younger than 30 years. It typically presents as a localized mass and microscopically involves ductal hyperplasia without atypia, and may also be associated with other benign proliferative findings.¹³ Approximately 10% of patients with juvenile papillomatosis have breast cancer.

Papillary carcinoma, mentioned for the sake of completeness, is more commonly found among women older than 60 years.

Mammary Duct Ectasia

Mammary duct ectasia is characterized by dilation of the mammary ducts. If symptomatic it typically causes nipple discharge, which is frequently bilateral, present in multiple ducts, and of various colors (not typically pathologic discharge). The discharge may be described as cheesy or viscous.⁸ It occurs most often in the perimenopausal period, but has also been described among younger women, children, and men.¹⁴ The cause is unknown, but an association with smoking has been described.¹⁵ Mammary duct ectasia generally does not require surgery and should be managed conservatively. When asymptomatic, duct ectasia does not require treatment. Duct excision

is recommended if the clinical presentation and mammographic findings are otherwise suggestive of malignancy.⁸

BREAST PAIN

Many women will experience breast pain at some point in their lives. Most of the time this pain is self-limited and resolves on its own; however, for some women the pain can be persistent. In a questionnaire sent to women in South Wales, 66% of respondents reported having some breast pain and 21% reported having severe breast pain. Less than half of the women with severe breast pain had discussed it with their physician.¹⁶ Nonetheless, breast pain is one of the most common breast symptoms encountered by primary care physicians.¹⁷ In rare instances, breast pain may be related to infection, malignancy, or a condition not associated with the breast. **Box 2** lists the extramammary causes that can present as breast pain. Once these possibilities are ruled out, mastalgia is a benign entity.

Evaluation of breast pain should begin with a detailed history and physical examination. The history should help to classify the pain as cyclical or noncyclical, explore for potential aggravating and alleviating factors, and evaluate for extramammary causes. **Box 3** lists important aspects to include in the history.^{6,18}

The physical examination should involve careful observation and palpation of the affected area, which can be reassuring to the patient and indicates that her fears and concerns are being taken seriously.⁶ In observing the patient, take note of skin marks along the bra line (indicating an ill-fitting bra) or shoulder marks from heavy handbag shoulder straps. Evaluate for any other skin lesions, including lesions characteristic of herpes zoster. Perform a thorough breast examination in the sitting and supine positions, evaluating for masses or abnormalities. To isolate pain related to the chest wall (chostochondritis) and differentiate it from true mastalgia, have the patient lay on her side or in the sitting position, leaning forward, allowing the breast tissue to be displaced before palpating the underlying chest wall.

A mammogram and/or breast ultrasonography should be ordered as indicated for any abnormalities discovered on examination. Whether a diagnostic mammogram should be ordered to further evaluate mastalgia in a woman with a normal breast examination is controversial. A study by Dujim and colleagues¹⁹ concludes that in women with mastalgia alone, mammography provides reassurance. Others believe that mammography is widely overused in this setting.¹⁷ It would certainly be appropriate

Box 2

Extramammary causes that may present as breast pain

- Costochondritis
- Tietze syndrome
- Cervical radiculopathy
- Myocardial ischemia
- Pneumonia
- Irritation of the pleura
- Esophageal spasm
- Rib fracture
- Shingles

Box 3**Obtaining a clinical history of breast pain**

Location

- Unilateral versus bilateral
- Localized within a specific area of the breast
- Deep or superficial
- Involving chest wall

Timing

- Constant versus variable
- Variations with menstrual cycle

Associated symptoms

- Symptoms of infection (fever, chills, erythema, swelling)
- Symptoms of malignancy (palpable mass, nipple retraction, skin changes)
- Previous surgery
- Recent injury

Aggravating and alleviating factors

- Caffeine use
- Tobacco use
- Nonsteroidal anti-inflammatory use

Severity

Recent weight changes

- Loss or gain of more than 10 lb (4.5 kg) in past year

Medications

- Hormonal medications
- Antidepressants
- Spirolonactone
- Methyldopa

to order a screening mammogram for women older than 40 if not performed in the past year.

Cyclical Breast Pain

Approximately two-thirds of women with breast pain have cyclical pain.²⁰ By definition, cyclical pain occurs in a predictable pattern with the menstrual cycle. It is typically worse in the luteal phase and is relieved by the onset of menses. It is frequently bilateral, and is often most severe in the upper outer quadrants. Cyclical pain is most common among women in the reproductive years, and typically improves after menopause.

The etiology of cyclical breast pain (mastalgia) is poorly understood. Many patients with cyclical mastalgia also have breast nodularity and tenderness. However, there is no consistent association between symptoms and breast histology,¹⁷ and fibrocystic changes are now thought to be secondary to normal physiologic breast involution as

opposed to a disease process.²¹ Cyclical breast pain is likely due to hormonal changes, given that it occurs during the reproductive years and fluctuates with the menstrual cycle. However, studies have demonstrated that women with cyclical mastalgia have hormone levels similar to those of women who do not have breast pain. It has been suggested that, rather than differences in absolute hormone levels, an increased sensitivity to hormones may explain cyclical mastalgia.¹⁷

Management of cyclical mastalgia should start with reassurance. Women are often relieved that breast pain is common and is rarely the sole manifestation of breast cancer.⁶ For some women, no further treatment is needed. In addition, there are lifestyle and dietary interventions that may alleviate cyclic mastalgia. The use of a well-fitting support bra and initiation of regular exercise have been proved to improve mastalgia.^{6,17,22} The elimination of caffeine (and other methylxanthines) is more controversial, as it has been shown to reduce the severity of mastalgia in some studies but has proved to be ineffective in other studies.¹⁷ Avoiding caffeine is still commonly recommended because it carries few risks and may have other health benefits. Vitamin E supplementation also may be effective in decreasing pain; however, this has not yet been confirmed by a placebo-controlled trial. Evening primrose oil has been demonstrated to reduce mastalgia in placebo-controlled trials, although it often takes a long course of treatment (at least 4 months) to achieve this result.¹⁷

Endocrine therapies (such as bromocriptine, danazol, and tamoxifen) have been shown to be effective in treating cyclical mastalgia; however, such treatments are associated with side effects that limit their use.¹⁷ In a meta-analysis evaluating randomized controlled trials for the treatment of cyclical mastalgia by Srivastava and colleagues,²³ bromocriptine, danazol, and tamoxifen were all found to offer significant relief from mastalgia. High-quality data comparing each of these medications with one another are not yet available.

Noncyclical Breast Pain

Noncyclical breast pain does not follow the typical menstrual pattern. It is more likely to be unilateral and to vary in location. It is important to evaluate for specific pathologic processes that can be treated, such as trauma and postoperative pain syndromes, breast cysts, duct ectasia, and periductal mastitis.

Trauma to the breast and breast surgery can obviously cause pain in the acute setting and is typically clinically obvious. What may be less obvious is that a prior history of trauma to the breast and previous surgery may lead to fat necrosis or other remodeling processes, causing pain that can persist for many years after the initial event.⁶ Imaging studies of fat necrosis are often concerning for malignancy and should be evaluated by tissue biopsy, even when a patient gives a history of prior trauma to the region.²⁴ Mondor disease is a form of superficial thrombophlebitis of the anterior thoracoabdominal wall that can be caused by trauma (including muscular strain and electrocution) or surgery. It presents with a subcutaneous, tender, cord-like induration between the epigastric and axillary regions. The diagnosis is confirmed by ultrasonography, and treatment involves anti-inflammatory medications.²⁵

Large palpable breast cysts can be associated with breast pain. These cysts can be confirmed by ultrasonography and are typically effectively treated by needle aspiration. Simple breast cysts are typically benign in nature. However, if a bloody aspirate is obtained, a mass persists after aspiration, or the cyst recurs, a biopsy should be performed.⁶

Periductal mastitis is another important cause of noncyclical mastalgia. Examination may demonstrate overlying skin erythema, a subareolar breast mass or abscess,

or a fistula. Diagnosis can be confirmed by ultrasonography. Surgical treatment is usually indicated (see later discussion).

PALPABLE BREAST MASSES

A palpable breast mass may be described by the patient as a finding she noticed on her own, or may be discovered on routine physical examination. A medical history should be obtained, including the length of time the mass has been present, changes in size over time, fluctuations with the menstrual cycle, and any associated pain, skin changes, or nipple discharge.²⁶ Prior history of breast health should be obtained, including past breast biopsies or surgery and any episodes of abnormal imaging. Risk factors for breast cancer should be assessed, including a detailed family history.⁶

A clinical breast examination should be performed with visual inspection, palpation of the axillae, supraclavicular, and cervical lymph node regions, and palpation of bilateral breasts.²⁷ Any palpable finding should be described using clear, descriptive terminology, including the size, tissue consistency, mobility, margin characteristics, distance from the areolar edge, and the clock-face position. Occasionally a patient may present for evaluation of a breast mass, but during the clinical examination neither she nor the provider is unable to palpate it. In this instance it is recommended that she return for a repeat breast examination in 2 to 3 months, possibly in the follicular phase of the menstrual cycle.²⁷

When a dominant mass or concerning area is identified on examination, imaging studies should be obtained. The ordering physician should describe the exact location (including clock-face position and distance from the nipple or areolar margin) to ensure that these studies target the area of interest. Breast ultrasonography should be performed to determine whether the lesion is solid or cystic and to further characterize it as suspicious or benign-appearing. For women older than 30 years, a diagnostic mammogram should also be ordered.²⁷ Mammography can help determine whether a lesion is potentially malignant, and also screens for occult disease in surrounding tissue. The results of these imaging studies should be reported by the radiologist using the Breast Imaging Reporting and Data System (BI-RADS), which classifies studies according to the level of suspicion for malignancy (further discussed in the article by Garcia and colleagues elsewhere in this issue).

In some instances, mammography and ultrasonography cannot identify any lesion that correlates with the palpable findings. If the palpable area persists and remains concerning, a biopsy or referral to a breast surgeon should be obtained. A small percentage of breast cancers are present only as a palpable mass but cannot be identified with imaging studies, so it is important to consider that normal imaging studies cannot completely exclude malignancy.¹⁸

Imaging may suggest a specific benign lesion based on its characteristic appearance (BI-RADS 2) or may suggest that the lesion is “probably benign” (BI-RADS 3). If the patient’s history and physical examination are also consistent with benign disease, the lesion can be followed clinically or with short-interval follow-up. If the clinical findings remain worrisome despite reassuring imaging, a biopsy of the lesion is recommended for further evaluation.²⁷ Imaging studies that result as BI-RADS 4 or 5 are more suspicious for malignancy, and a tissue biopsy is warranted.

Percutaneous core-needle biopsy is now the most commonly used and favored modality for obtaining a breast-tissue specimen for diagnosis.⁸ It is a minimally invasive technique, has few complications, and minimizes surgical changes to the breast.²⁷ Fine-needle aspiration was used more commonly in the past, but has been criticized for having a relatively high rate of obtaining samples deemed inadequate

or suboptimal. One study found 28% of samples inadequate and an additional 22% less than optimal.²⁸ When the pretest probability of malignancy is low, fine-needle aspiration can be used in combination with clinical examination and imaging studies, which is termed the triple test. When all 3 studies suggest a benign process, there is a 99% certainty that the mass is benign.²⁷ Surgical excisional biopsy is generally reserved for special circumstances when core-needle biopsy cannot be performed, or when the results of the core-needle biopsy require that additional tissue be obtained to confirm a benign diagnosis.²⁷

Fibroadenoma

Fibroadenomas are common benign lesions of the breast that arise from the epithelium and stroma of the terminal duct–lobular unit.⁸ These lesions are most common in young women between the ages of 20 and 40 years, but can be found in women of any age. Fibroadenomas typically present as a discrete painless breast mass discovered by the patient. On examination a fibroadenoma is smooth, mobile, well circumscribed, and has a rubbery consistency. Approximately 10% to 20% are multiple and bilateral.⁸ On ultrasonography they are typically elliptical or lobulated, and are “wider than tall.” Most measure less than 3 cm in size. A fibroadenoma larger than 6 cm is referred to as a giant fibroadenoma, and must be distinguished from a phyllodes tumor (see later discussion). Unlike fibroadenoma, phyllodes tumors may enlarge quickly and can visibly distort the breast.¹⁸

A fibroadenoma that has been confirmed by core-needle biopsy does not require surgical excision unless it is bothersome to the patient or clinically enlarges over time.¹⁸ Newer technologies, such as ultrasound-guided vacuum-assisted removal and cryoablation, offer minimally invasive approaches to treating small fibroadenomas smaller than 2 cm.⁸

Phyllodes Tumor

Phyllodes tumors are rare, accounting for less than 1% of all breast tumors.²⁹ These tumors are fibroepithelial, with the potential to become malignant, recur, and metastasize to other organs.⁸ Most women present with a firm palpable mass with examination findings similar to those of fibroadenoma. The average size is 4 to 5 cm, but they can be small (1 cm) or extremely large (>30 cm). Unfortunately, there are no specific imaging features on mammography, ultrasonography, or MRI that can distinguish a phyllodes tumor from a fibroadenoma.²⁹

Histologically, phyllodes tumors are classified as benign, borderline, or malignant. Of note, even benign phyllodes tumors recur, and both borderline and malignant tumors have the ability to metastasize. Management of nonmetastatic phyllodes tumors requires wide local excision with margins 1 cm or greater. Total mastectomy is recommended if negative margins cannot be obtained.²⁹

Hamartoma

Hamartomas account for 4.8% of benign breast tumors,⁸ and consist of ducts, lobules, fibrous stroma, and adipose tissue all arranged in a disorganized fashion. Hamartomas present as painless, well-circumscribed, mobile masses, and are most common among women aged 30 to 50 years. On ultrasonography they appear as a solid mass. Mammography demonstrates a sharply defined, homogeneously dense mass.³⁰ Once confirmed by tissue biopsy, if no atypia is identified they can be managed with observation alone.⁸

Fibromatosis

Also referred to as a desmoid tumor, fibromatosis of the breast is similar to fibromatosis at other sites. It is an uncommon tumor characterized as an infiltrating, well-differentiated proliferation of spindle cells.⁸ Fibromatosis may be seen in patients with a history of familial adenomatous polyposis (FAP). Women present with a palpable mass that may adhere to the chest wall or cause dimpling or retraction of the skin. For this reason, it can be suspicious of malignancy.³¹ On ultrasonography, it can appear lobulated or spiculated, with irregular margins.³² It is frequently not detectable on mammography, but may appear spiculated and irregular when seen.³² MRI is the best method for determining the size and extent of the lesion.³¹ The recommended treatment is wide local excision. Positive margins are associated with a high risk of recurrence, and should be re-excised.⁸

Lactating Adenoma

The most common palpable breast mass among young pregnant women is a lactating adenoma,³³ which only arise during pregnancy and in the postpartum period. Women present with well-circumscribed masses that typically measure 2 to 4 cm.⁸ Ultrasonography demonstrates an ovoid mass with well-defined margins. A core-needle biopsy should be performed to obtain a diagnosis and evaluate for malignancy. Histologically a lactating adenoma appears as a lobulated mass of enlarged acini surrounded by a basement membrane and edematous stroma.³⁴ Approximately 5% of cases are complicated by hemorrhage and infarction of the breast tissue. It is thought that infarction occurs because of relative vascular insufficiency of the breast during this time, owing to a high requirement for blood supply during pregnancy and lactation.³⁴ Following completion of pregnancy and lactation, lactating adenomas typically involute. If the mass persists or enlarges, surgical excision should be considered.³⁴

ADOLESCENT BREAST DISORDERS

Breast concerns among adolescent women are common. Concerns about nipple discharge and breast pain may arise in this age group. The evaluation and management of these problems in adolescents is similar to that conducted for adults. Adolescent women can be given greater reassurance than their older counterparts that the incidence of breast cancer among women of their age is very rare. Nonetheless, their concerns should be adequately evaluated and addressed.

The most common breast masses among adolescent women are fibroadenomas. Giant fibroadenomas and phyllodes tumors can also occur, and should be considered in the differential diagnosis. Palpable masses should be evaluated with ultrasonography. There is no role for mammography in the adolescent woman.

A few additional concerns that may arise in adolescence are covered here, including breast asymmetry, tuberous breasts, and juvenile hypertrophy.

Breast Asymmetry

During puberty, it is not uncommon for one breast to develop more rapidly than the other. On physical examination, asymmetry is noted without any palpable masses. Ultrasonography may be ordered for further evaluation of a mass contributing to asymmetry when warranted. With a negative evaluation, patients and their parents can be reassured that asymmetry often becomes less noticeable with age. When plastic-surgery procedures are desired, they should be delayed until after full breast development is complete.³⁵

Tuberous Breast Deformity

Tuberous breasts are breasts with a limited breast base and overdeveloped nipple-areolar complex. This condition may be caused by the use of exogenous steroids or hormones. When extreme, they can be surgically managed.³⁵

Juvenile Hypertrophy

Juvenile hypertrophy describes extreme macromastia with pathologic overgrowth of bilateral breasts, with onset at menarche. Each breast may weigh as much as 30 to 50 lb (13.6–22.7 kg), leading to back and neck strain. Surgical management with reduction mammoplasty is often considered in the older teen or young adult.³⁵

INFLAMMATORY LESIONS

There are many benign causes that can lead to inflammatory breast lesions; however, breast inflammation may also be a manifestation of malignancy. It is important to appropriately evaluate these lesions, prevent complications of infectious causes, and accurately and promptly diagnose inflammatory breast cancer. This section discusses benign inflammatory lesions, ways to distinguish them from malignant lesions, and the management of such lesions. Inflammatory lesions may be classified as infectious, noninfectious, and malignant.

The evaluation should begin with a thorough history. The patient should describe the timing of the redness and whether the extent of redness has changed over time. Any associated masses should be noted as well as systemic symptoms including fevers, chills, and weight loss. Special attention should be paid to risk factors for breast infections such as lactation, smoking, prior infections or abscesses, nipple piercing, and recent surgery.³⁶ Physical examination should focus on the breast and axilla, evaluating for erythema, masses, purulent drainage, and lymphadenopathy. Imaging studies such as ultrasonography and/or mammography may be indicated to evaluate for associated masses or evidence of malignancy.

Lactational Infections

Lactational mastitis is the most common form of mastitis. It occurs in approximately 2% to 10% of breastfeeding women and typically occurs during the first 6 weeks of breastfeeding or weaning.⁸ Lactational mastitis is associated with engorgement, poor milk drainage, and excoriated nipples. Women may present with fevers, malaise, and occasionally rigors. On examination there is typically erythema, localized engorgement, or swelling. Treatment consists of antibiotics and encouragement of milk flow from the engorged segment.³⁷ A smaller proportion of breastfeeding women (0.4%) develop a breast abscess, which in some cases may be due to suboptimal management of mastitis.³⁷

A suspected breast abscess or any mastitis that does not resolve despite the completion of a course of antibiotics should be evaluated with ultrasonography. When an abscess is identified, management should include either aspiration of the fluid or incision and drainage. When the tissue overlying the abscess is normal, aspiration may be the most suitable option. Aspiration should be done in combination with the use of oral antibiotics, and reaspiration should be performed every 2 to 3 days until no further purulent fluid can be drained.³⁷ If, however, the skin overlying the abscess appears thinned or necrotic, it may be more advisable to proceed to incision and drainage rather than attempt to manage with aspiration, given that these patients have a higher likelihood of failing treatment with repeated aspiration.³⁷

Nonlactational Infections

Nonlactational infections include periductal mastitis, granulomatous lobular mastitis, and skin-associated infections (such as infected epidermal cysts and cellulitis of the breast). Periductal mastitis describes a condition of damaged subareolar ducts that become infected. Smoking tobacco is considered to be a major causative factor, with 90% of patients who develop periductal mastitis being smokers.³⁷ Women with diabetes are more likely to have recurrent infections.³⁷ Granulomatous lobular mastitis is less common, and typically presents as a peripheral inflammatory mass of unknown cause. Nonlactating abscesses can be managed similarly to lactating abscesses, with aspiration or incision and drainage combined with oral antibiotics. Recurrent infections are more common than they are among lactating abscesses, typically because the underlying abnormality in the central ducts persists. Women who have recurrent disease may require definitive surgery with total duct excision, which removes the diseased ducts to prevent infection from recurring.³⁷

Malignant Inflammatory Lesions

Inflammatory breast cancer mimics an infectious process. Most patients who are diagnosed with inflammatory breast cancer were initially misdiagnosed as having an infectious process. When inflammation does not resolve with treatment, inflammatory breast cancer should be considered. A mammogram and ultrasonogram should be ordered, and any suspicious findings should be biopsied. The skin can also be biopsied to confirm the diagnosis.¹⁵

BENIGN BREAST ABNORMALITY DETECTED ON IMAGING AND BIOPSY

Routine screening mammograms may reveal benign breast abnormalities that are not otherwise clinically evident or symptomatic. On imaging, they may appear similar to malignancies: as calcifications, a mass or density, asymmetry, or an area of architectural distortion.¹⁸ Of all screening mammograms performed, approximately 10% will require additional imaging. Of those, approximately 8% to 10% will require biopsy. Breast cancer will be detected in 4 of every 1000 women undergoing screening mammography. The remaining women who undergo biopsy for abnormal imaging findings will be diagnosed with benign breast disease.^{38,39} It is important for the obstetrician-gynecologist to be familiar with these diseases. Some require further evaluation and referral to a breast surgeon for surgical excision. Others may be associated with an increased risk of developing breast cancer in the future. In general, these lesions can be classified as nonproliferative lesions, proliferative lesions without atypia, and proliferative lesions with atypia.

Nonproliferative Lesions

Breast cysts are common nonproliferative lesions found incidentally on imaging, which originate from the terminal ductal lobule unit and can vary in size from microscopic to large, clinically palpable masses. Small simple breast cysts found incidentally on imaging are nearly always benign and do not require any further workup. Other nonproliferative lesions include mild hyperplasia and papillary apocrine change (commonly found in fibrocystic disease), which also do not require any further workup. In general, nonproliferative lesions are not considered to increase a woman's risk of developing breast cancer.²⁷

Proliferative Lesions Without Atypia

Proliferative lesions without atypia include fibroadenomas, intraductal papillomas without atypia, sclerosing adenosis or radial scar, and pseudoangiomatous stromal hyperplasia (PASH). Fibroadenomas and papillomas are described in an earlier section of this article. A radial scar is a complex sclerosing lesion with a radial center. When seen on a mammogram it appears spiculated, similar to a small invasive carcinoma. Histologically, it consists of proliferative changes surrounding a fibroelastic core that can mimic the appearance of a malignancy. When diagnosed on a core biopsy, an excisional biopsy is generally recommended to evaluate the entirety of the lesion. Sclerosing adenosis can also present as a suspicious finding on imaging, but the risk of subsequent breast cancer is small, and no treatment is required.

PASH is a myofibroblastic proliferation of the breast. On mammography it appears as an oval mass without microcalcifications. When PASH is diagnosed by percutaneous core biopsy, no further management is necessary as long as the abnormality is concordant with the imaging findings. If imaging is otherwise suspicious, surgical excision is recommended.⁴⁰ There is no increased risk of developing subsequent breast cancer.⁴⁰

Proliferative Lesions with Atypia

Proliferative lesions with atypia include various types of epithelial hyperplasia with atypical cells. Women diagnosed with these lesions carry an increased risk of developing breast cancer, with a relative risk of 3.9 to 13.0.¹⁵ Depending on the type of cells involved, they are classified as atypical ductal hyperplasia, atypical lobular hyperplasia, or flat epithelial hyperplasia. When diagnosed on core biopsy, these lesions should undergo surgical excision because a significant number are “upgraded” to carcinoma in situ on excision.⁸

Given that women with these benign lesions are identified as having an increased risk of breast cancer, they can be counseled about options for increased screening and risk reduction, as discussed in the article by Green elsewhere in this issue.

SUMMARY

Benign breast lesions are much more common than malignant lesions. Women may present with specific complaints related to their breasts, or may have abnormal screening mammograms that lead to the diagnosis of benign breast disease. Evaluation should include obtaining a relevant history, performing a physical examination, ordering imaging studies as appropriate, and obtaining a tissue diagnosis when indicated. Some benign breast diseases have been associated with an increased risk for developing breast cancer.

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