Uncommon Benign Breast Abnormalities in Adolescents

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Abstract

The authors discuss benign breast abnormalities in the adolescent breast other than fibroadenoma. Although fibroadenoma is the most common benign abnormality in the adolescent breast, other diagnoses are possible. The majority of adolescents who present with a palpable concern or lump have no discrete abnormality on ultrasound and are diagnosed with clinical fibrocystic change and followed up to ensure clinical stability. Intraductal papilloma and duct ectasia are two benign abnormalities associated with bloody nipple discharge, occurring more rarely in adolescents compared with adult women. Breast infections can occur in adolescents, including both mastitis and/or abscess, and are treated similarly to adults, with drainage and antibiotic coverage for *Staphylococcus*. When infections are due to nipple piercing, other organisms should be suspected. All surgical procedures in the developing breast should be performed cautiously, as trauma to the undeveloped breast can result in failure of breast development or asymmetry, and surgical disruption of subareolar ducts can impair or preclude future lactation.

Keywords

- benign breast
- fibrocystic change
- papilloma
- duct ectasia
- adolescent

Although fibroadenoma is the most common breast mass in the adolescent female breast, other benign conditions encountered include fibrocystic change, duct ectasia, intraductal papilloma, trauma, and infection.

Fibrocystic Change

Fibrocystic change is a term that may be used as either a histological or clinical description of benign breast disease, and fibrous mastopathy is another term that has been similarly used.¹ In the histological setting, fibrocystic change refers to the microscopic features that characterize abnormalities seen in benign breast biopsies that do not represent a distinct macroscopic breast lesion. These findings include stromal fibrosis, cysts, apocrine metaplasia, columnar cell change, sclerosing adenosis, and epithelial hyperplasia. Large studies of benign breast disease in adult women have shown that risk of later breast cancer is stratified by the degree of epithelial proliferation identified histologically within the breast tissue.^{2,3}

The term fibrocystic change is also commonly used as a clinical diagnosis to describe a breast condition characterized by clinically palpable breast tissue changes, with nodular dense fibrous areas on physical exam that may lack a discrete mass lesion such as a fibroadenoma or macrocyst. Palpable findings in the tissue are often described as vague or ridge-like areas of density or thickening. Tissue biopsy in these women may show a range of benign histological findings as described above, but fibrosis within the stroma is the common feature. Clinically, patients present with palpable abnormalities of the breast with or without pain. Ultrasonographic features tend to be nonspecific, and include solitary or multiple cysts of varying sizes, fibrous echogenic tissue, and dilated ducts. A clinical diagnosis of fibrocystic change is usually made after thorough history, physical examination, and appropriate diagnostic testing fail to attribute the findings to a specific breast lesion.

In a study reporting the 10-year experience of adolescents with breast complaints, 634 adolescent girls (age 9–19) were evaluated.⁴ The majority (93%) was aged 15 to 19 years and

had a primary complaint of lump or thickening in the breast (87%). Ninety-eight percent were evaluated with ultrasound, of which 59% showed no abnormality. Fine needle aspiration was performed in 142 (22%), with no suspicious findings by cytology. The majority of the cohort was thus judged to have fibrocystic change or no abnormality. The management of fibrocystic change is conservative, with reassurance and follow-up to ensure clinical stability.

Bloody Nipple Discharge: Duct Ectasia and Intraductal Papilloma

Bloody nipple discharge is a presenting complaint in ~5% of adult female breast consultations due to its bothersome nature as well as the concern of an underlying malignancy. In the adult population, duct ectasia and intraductal papilloma are the two most common histological diagnoses found in cases of bloody nipple discharge. In a report of 1,145 adult women presenting with nipple discharge, 267 underwent surgical intervention.⁵ Among these, the most common histological findings at duct excision were duct ectasia and intraductal papilloma, with carcinoma found in approximately 20%. In the pediatric and adolescent population, bloody nipple discharge is rare, but it is also associated with the same benign histologies of duct ectasia and intraductal papilloma.

Duct ectasia is a histological diagnosis characterized by dilation of the subareolar mammary ducts, with periductal fibrosis and inflammation.⁶ Intraductal papilloma is an epithelial lesion of breast ducts with epithelium-covered fibrovascular cores.⁷ In 1983, bloody nipple discharge was first reported in infants⁸ since then several other case reports have followed on the rare condition of nipple discharge and duct ectasia in infancy through early adolescence. In a recent summary of the literature, 23 pediatric patients with mammary duct ectasia are described.⁹ The reported children with duct ectasia presented at a range of age, from 6 weeks to 13 years, and had a male predominance of 5:2. The most common presentation was bloody nipple discharge of several weeks or months duration. Other physical findings included a discrete mass or general breast enlargement. In one case, papilloma was the benign histological finding. Ultrasound findings include dilated ducts (anechoic or filled with debris), and cystic lesions (simple or complex).¹⁰ In a report of 11 children with bloody nipple discharge at one center, laboratory evaluation of hormone levels was performed, with normal values in all.¹¹ In some cases, surgical biopsy and even subcutaneous mastectomy have been performed,^{12,13} whereas in other cases, the nipple discharge resolved spontaneously in 6 to 12 months, suggesting that expectant management will likely be successful in the majority.¹⁴⁻¹⁶

Although the etiology of bloody nipple discharge in children is not always clear, the possible very early age at onset suggests a congenital component in some cases. Infection and inflammation may play a role in some cases of bloody nipple discharge where positive bacterial cultures were obtained (*Staphylococcus aureus* or *Staphylococcus epidermidis*), with clinical resolution after antibiotic therapy.¹¹ For this reason, Imamoglu et al recommend culture as the first step in their

recommended treatment algorithm for bloody nipple discharge in the nonadult population. If culture is positive, initial treatment consists of appropriate antibiotic therapy. If culture is negative, then ultrasound is performed. They recommend surgical excision for cystic or solid masses, and observation for cases with negative ultrasound or diffuse breast enlargement.¹¹ Caution is advised for proceeding with surgical intervention, especially in prepubertal and adolescent girls, because excision or damage to the breast bud can result in failure of breast development or significant breast deformity.¹⁷ Despite this, successful focused excision with preservation of the underlying breast bud has been reported.¹⁸ With multiple reports that bloody nipple discharge in children may spontaneously resolve, observation is the preferred management approach, reserving surgery for cases that persist after several months with an associated mass.⁹ In later adolescence with a developmentally mature breast, bloody nipple discharge is also most likely benign, but less likely to be a tolerable long-term symptom. If surgery is performed, dissection should be minimized to the involved duct, but long-term functional impairment of lactation may result.

Infection

Infections in adolescent female breasts resemble those in adult female breasts and are managed similarly. Patients present with pain and breast erythema, with or without systemic symptoms of infection, such as fever, chills, or myalgia. Risk factors for infection in the adolescent age group are lactation, duct obstruction, trauma, and immunocompromise, and *Staphylococcus aureus* is the most common organism.¹ Ultrasound is recommended to differentiate cellulitis from abscess because drainage is appropriate if an abscess is identified. Percutaneous drainage is preferred whenever possible, with serial ultrasound and aspiration every 48 hours until resolution.¹⁹ Open surgical drainage is reserved for very large abscesses (> 5 cm), cases with systemic sepsis, or for abscesses that recur despite percutaneous drainage.²⁰ Antibiotic therapy should be narrowed to the causative organism when culture and susceptibility results are available. For treatment of puerperal infections caused by sensitive organisms, dicloxacillin is considered the antibiotic of choice because it is safe for the nursing infant.²⁰ It is generally recommended that lactating women continue to evacuate the affected breast by means of breastfeeding or pumping to promote expulsion of milk from the affected ducts and prevent stasis, which would favor abscess formation.²¹ Infections associated with piercing of the nipple may present either early or late, and may be attributable to other organisms, such as β -hemolytic *Streptococcus* and *Actinomyces*, making culture and sensitivity of the causative organism of particular importance in this population.²² Spontaneous non-puerperal abscesses in adults are associated with smoking and diabetes,²³ conditions that also affect adolescents. In addition to treatment of the primary breast infection, management of predisposing factors may reduce the risk of recurrent abscess formation.²³

Trauma

Trauma to the adolescent breast is also managed similarly to that in the adult. Pathological findings associated with trauma are hematoma (early) and fat necrosis (late). Conservative management is the goal in management of adolescent breast trauma, unless associated with infection, significant underlying tissue necrosis, or expanding hematoma. In adult patients, Sanders et al demonstrated a strong correlation between blunt traumatic breast injury and injury to other structures, including long bone and rib fractures,²⁴ which may require operative management. However, most breast injuries (93.5%) were successfully managed expectantly. The remaining 6.5% of patients required intervention via either angiographic arterial embolization or open control of bleeding vessels. Severe breast trauma can lead to fat necrosis requiring surgical débridement, in which case it may be helpful to have the assistance of a plastic surgeon during operative planning and execution.²⁴ Asymmetric breast development can result if traumatic or iatrogenic injuries damage the developing breast bud. Consideration should always be made to the history of the trauma, taking care to assess the situation for evidence of child abuse or assault.

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