Sonography of the Pediatric and Adolescent Breast

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Abstract

The intense world awareness of carcinoma of the adult breast has led to unfounded concerns about lumps and asymmetric findings in children and adolescents. Carcinoma of the breast in adolescents is a rare exception. The numerous benign findings in young people are best evaluated by inexpensive sonographic imaging with clinical correlation. This avoids unnecessary exposure to the radiation of a mammogram. Even fine needle aspiration and ultrasound guided core biopsy can have an adverse effect on the normal growth of the breast of an adolescent female. In a busy ultrasound practice, there is never less than two children/day requiring evaluation with appropriate counseling of parents and referring physicians.

Introduction

Screening mammography of adults, beginning at age 40, has become the world-wide standard of care in early detection of breast carcinoma(1). With the exception of genetic disorders (BRCA1 and BRCA2 mutations), the detection of breast carcinoma in patients younger than 25 is virtually reportable. Success in breast cancer detection in adults brings with it the unintended consequence of referral of children and adolescents to radiology facilities for a wide range of benign and usually physiologic disorders. Grey scale ultrasound with high frequency transducers and simultaneous palpation by both the technologist and radiologist is an inexpensive and harmless approach to reassure this growing population. Adjunctive tests such as mammography, MRI, PET scanning, and biopsy are to be avoided unless the ultrasound is distinctly abnormal.

Results

Benign Findings in Infants and Children

Even in infants, the breasts of both males and females may appear enlarged due to the effects of maternal hormones. Subareolar palpable tissue may persist for the first six to twelve months of life (2). This finding requires only serial clinical evaluation. We have not found sonographic imaging to add to these obvious palpable findings.

Benign Findings in Adolescent Males and Females

Thelarche represents the onset of pubertal breast development in girls. This begins at age eight years and normally before 13 years of age. If development is asymmetric or the breasts are painful, sonography proves helpful in showing normal dense ductal and parenchymal tissue.

For boys, glandular gynecomastia can present as tender subareolar nodules. At puberty, the majority of boys will have some degree of breast enlargement (5). This, too, is best addressed by palpation and correlation with sonography.

A wide variety of benign disorders can affect girls both before and after puberty. These include juvenile hypertrophy, mammary duct ectasia, galactoceles, cysts of the Montgomery glands, and mastitis (9). Hematomas normally occur from sports injury in active adolescents.

Fibroadenomas are the most common breast mass in girls younger than 20 years of age (4).

Malignant Findings in Adolescent Females

Malignant lesions, while rare in adolescents, present much as in adults. The most common is phyllodes tumor. These present as painless, rapidly growing masses. While histologically benign, there is a risk of recurrence and invasive growth (7).

Carcinoma of the breast is rare in women younger than 20 (8). The author has diagnosed a fatal inflammatory carcinoma of the breast in a 16 year old teenager. There was no family history and all attempts to secure any predisposing genetic factor have proven unsuccessful.

Conclusion(s)

To deal with the widespread concern of lumps and asymmetry of the childhood and adolescent breast, the use of high frequency ultrasound imaging, clinical correlation, and even serial studies have proven an
inexpensive and reliable approach. The rare of finding of pre-clinical or even frank carcinoma is a rarity, but should be approached with the same aggressive techniques of diagnosis and treatment as adult carcinoma of the breast.

Reference(s)

Illustrations

Illustration 1

- Solid mass with irregular margins in a sixteen year old. Note the increased peripheral color flow on Doppler interrogation.

Illustration 2

Ultrasound core biopsy of the worrisome mass left breast. Such a procedure would normally be contraindicated in a teenager for fear of disrupting normal breast tissue development.
Illustration 3

Whole body FDG PET scan in this same patient demonstrates widespread body and organ metastasis the same week as diagnosis. Tumors in young people are unusually aggressive.
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