Editorials

Breast Masses in Adolescents: Clinical Pearls in the Diagnostic Evaluation

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The diagnostic evaluation of an adolescent presenting with a breast mass differs substantially from that of an adult because of marked differences in breast cancer risk and breast architecture. In the adolescent, early clinical assessment and close follow-up are most important, and there is less emphasis on exclusion of a breast malignancy. In adults, 11 percent of breast masses represent breast cancer.[1] In adolescents, only 0.02 percent of surgically removed masses represent a breast malignancy, whereas fibroadenomas account for up to 95 percent of breast masses.[2-4]

The prevalence of breast masses among teenage girls is approximately 3.2 percent.[5] Common causes include fibroadenoma, cysts, hamartoma, fat necrosis, or abscess. Because the diagnosis of a primary breast carcinoma is rare, the differential diagnosis includes rare metastatic disease from malignant tumors, including rhabdomyosarcoma, lymphoma, and neuroblastoma.[6]

Evaluation begins with eliciting a detailed history on duration, change in mass size, nipple discharge, precipitating factors, and constitutional symptoms. The presenting symptom of a breast mass or increase in mass size would increase the suspicion of a cyst, fibroadenoma, phyllodes tumor, or hamartoma. Nipple discharge in a patient with a breast mass would lead to a differential diagnosis of intraductal papilloma, infection, cyst, or physiologic areolar glandular secretions. It is important to exclude a diagnosis of malignancy in an adolescent with a history of weight loss, anemia, fever, or fatigue.[7,8] The examination includes documentation of Tanner staging, mass location using the clock face, distance from the nipple, and size in two dimensions. This is prudent for monitoring changes over time and communicating findings to other physicians.

The preferred imaging modality in adolescents is breast ultrasonography, which can better characterize and delineate breast masses, differentiate cystic from solid masses, and increase sensitivity while avoiding radiation exposure.[9] Indications include an irregular, firm mass; skin erythema or tethering; bloody nipple discharge or retraction; an enlarging mass; or a persistent mass without regression after three to four months.[2] A solid, suspicious lesion detected on ultrasonography requires a percutaneous biopsy preoperatively to guide surgical intervention. Mammography is rarely, if ever, indicated in adolescents because of the dense nature of the breast, which significantly reduces mammographic sensitivity.[7] When a malignancy is suspected, magnetic resonance imaging may be useful to evaluate the extent of disease.

Management of breast masses is conservative and guided by clinical diagnosis and diligent follow-up. Palpable symptomatic cysts can be managed with ultrasound-guided fine-needle aspiration, with collapse of the cyst and clinical follow-up to assess stability. Fibroadenomas typically present as well-circumscribed, rubbery, nontender, firm masses that slowly grow to a size of 2 to 3 cm.[10] Most remain static in size or resolve spontaneously. Clinical observation over two to four months is appropriate. Masses that grow by more than 1 cm, and those larger than 2 cm warrant directed ultrasonography and percutaneous biopsy to confirm that they are benign.[11]

Surgical excision of a breast mass is recommended in the following situations: mass larger than 5 cm (even if biopsy confirms a fibroadenoma), rapidly enlarging mass, pain, distortion of the breast architecture, and skin changes. Phyllodes tumors, which account for less than 1 percent of breast masses in adolescents, can resemble giant fibroadenomas but have increased stromal cellularity pathologically.[10] They can grow rapidly (by as much as 15 cm over weeks to months), and require prompt imaging, biopsy, and referral for excision because of their potential to metastasize.[10] Surgical excision of large masses is recommended in any case to prevent distortion of breast architecture and need for augmentation to fill the postoperative defect.[10] Surgical expertise is critical to protect the development of the breast bud while maintaining a good cosmetic outcome.

Literature on the use of minimally invasive procedures, such as cryoablation of masses in adolescents, is limited.[12] In patients who do not accept surveillance of multiple or small masses (less than 2 cm) and who are concerned about surgical scarring, management with vacuum-assisted, ultrasound-guided percutaneous excision can be an alternative to surgery.[13]

The discovery of a breast mass can be disconcerting and can provoke anxiety and fear for the patient, her family, and her physician. Family physicians are

often the first point of contact, and should initiate appropriate investigation while providing a respectful, communicative approach to alleviate anxiety and body image issues.[10] Physicians need to tailor their care of the adolescent with a breast mass by recognizing the differential risk and importance of diligent follow-up, and taking a conservative approach. When clinical features provoke concern for a higher-risk mass, expertise with this adolescent population is important to optimize outcomes.

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Author disclosure: No relevant financial affiliations to disclose.

REFERENCES

1. Kerlikowske K, Smith-Bindman R, Ljung BM, Grady D. Evaluation of abnormal mammography results and palpable breast abnormalities. *Ann Intern Med.* 2003;139(4):274-284.
2. Simmons PS, Jayasinghe YL, Wold LE, Melton LJ III. Breast carcinoma in young women. *Obstet Gynecol.* 2011;118(3):529-536.
3. Jayasinghe Y, Simmons PS. Breast disorders in the female. In: Fisher MM, Alderman EM, Kreipe RE, Rosenfeld WD, eds. *Textbook of Adolescent Health Care.* Elk Grove Village, Ill.: American Academy of Pediatrics; 2011:621-634.
4. Bobo JK, Lee NC, Thames SF. Findings from 752,081 clinical breast examinations reported to a national screening program from 1995 through 1998. *J Nat Cancer Inst.* 2000;92(12):971-976.
5. Neinstein LS, Atkinson J, Diament M. Prevalence and longitudinal study of breast masses in adolescents. *J Adolesc Health.* 1993;14(4):277-281.
6. De Silva NK, Brandt ML. Disorders of the breast in children and adolescents, part 2: breast masses. *J Pediatr Adolesc Gynecol.* 2006;19(6):415-418.
7. Simmons PS. Diagnostic considerations in breast disorders of children and adolescents. *Obstet Gynecol Clin North Am.* 1992;19(1):91-102.
8. Marcus PM, Newman B, Millikan RC, Moorman PG, Baird DD, Qaqish B. The associations of adolescent cigarette smoking, alcoholic beverage consumption, environmental tobacco smoke, and ionizing radiation with subsequent breast cancer risk (United States). *Cancer Causes Control.* 2000;11(3):271-278.
9. Weinstein SP, Conant EF, Orel SG, Zuckerman JA, Bellah R. Spectrum of US findings in pediatric and adolescent patients with palpable breast masses. *Radiographics.* 2000;20(6):1613-1621.
10. Jayasinghe Y, Simmons PS. Fibroadenomas in adolescence. *Curr Opin Obstet Gynecol.* 2009;21(5):402-406.
11. Parker SJ, Harries SA. Phyllodes tumours. *Postgrad Med J.* 2001;77(909):428-435.
12. Kaufman CS, Littrup PJ, Freeman-Gibb LA, et al. Office-based cryoablation of breast fibroadenomas with long-term follow-up. *Breast J.* 2005;11(5):344-350.
13. Grady I, Gorsuch H, Wilburn-Bailey S. Long-term outcome of benign fibroadenomas treated by ultrasound-guided percutaneous excision. *Breast J.* 2008;14(3):275-278. ■