

Clinical Evaluation of Breast in Childhood

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ABSTRACT

Childhood breast masses are mostly benign conditions starting from the newborn period continuing on to adolescence yet can cause high anxiety in the child and the family as well. As a complaint or physical finding, usually palpable mass, pain or discharge from the nipple is apparent in patients. All the clinicians interested in pediatric field should have full knowledge of immature and developing breasts so to proper diagnose and avoid overtreatment with unnecessary diagnostic or surgical procedures. Though malignancy or life-threatening disease has a very low probability during childhood, all child patients should be evaluated and followed up carefully. Especially training and then encouraging young people to periodically start self-assessment of the breasts after their 19th birthday while warning the ones who have had therapeutic chest radiation previously to begin self-assessment 8 years after the procedure or at 25 years of age whichever comes last, will be an appropriate intervention.

Keywords: Breast, breast disease, childhood, newborn, children, adolescent

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Introduction

Development of breast begins during 5th week of gestation and completes the growth under estrogen effect. Pubertal breast development (thelarche) physiologically occurs at 8-13 years in girls under increased estrogen effect which is triggered by the hypothalamus and pituitary gland on the ovaries (1-3). In every stage of childhood, breast examination should be an indispensable part of physical examination either in girls or boys and should be included in the annual examination of all children and adolescents.

The American College of Obstetricians and Gynecologists recommends that all the adolescents should be educated and encouraged to carry out self-assessment of their breasts after their 19th birthday and for the patients who have had therapeutic chest radiation previously, to start 8 years after the procedure or at 25 years of age which comes last (4).

Neonatal Period

In some newborns, breasts could be observed overtly or palpably occurring under maternal estrogen effect. The nipple is seen shortly after birth in normal conditions, but it is usually depressed. Sometimes nipple discharge which mimics milk (witch's milk) can be observed in both sexes due to increasing prolactin levels of lactation (1, 2). The condition is diagnosed clinically and frequently resolves spontaneously. Although mastitis and breast abscess are rare in newborns, some traditional approaches (some creams, mixtures or to rub down) can exacerbate the condition and in these cases the use of antibiotics and a close follow up would be necessary (1, 2).

In Children

Lipomastia

Breast enlargement may be seen due to increased adipose tissue in overweight/obese children in both sexes (Lipomastia) (3). It is a clinical entity and differential diagnosis is made mostly by physical examination. There is no glandular tissue under the areola and the view is overt when the patient is sitting. Sometimes it is difficult to make differential diagnosis with gynecomastia where an ultrasonography would be needed (5).

Hemangiomas/lymphangiomas

In some cases, breast enlargement in prepubertal children may also be caused by hemangiomas or lymphangiomas (1). Although the diagnosis is clinically easily made in some cases there need to be advanced approaches such as ultrasonography and/or magnetic resonance imaging.

Amastia/hypomastia

Congenital forms may be isolated and genetical however some of the cases are associated with clinical entities such as ectodermal dysplasia, Poland syndrome, Crohn disease, some endocrinological disease's (1, 2, 6). Amastia/hypomastia are very rare conditions and mostly placed unilaterally. If there exists any extraordinary physical findings or complaints from the patient next to breast diversion, further investigation is needed.

Acquired forms are seen in traumas, radiotherapy, burns, some surgical procedures, and inappropriate biopsies of the breast bud. Treatment is designed according to underlying condition (1).

Polymastia/polythelia

Supernumerary tissue or accessory nipples are rare conditions and associated with cardiovascular or urinary tract anomaly. They usually exist on the chest, upper abdomen or in the inferior part of normal breast tissue (1, 2, 6). Surgery might be needed to solve cosmetic or functional problems (7).

Breast asymmetry and hypoplasia

In healthy people some breast asymmetry is normal. If asymmetry or hypoplasia is excessively visible; structural variations, hormonal diseases, chest diseases or procedures, tuberous breast anomaly should be taken into consideration (1, 2). If necessary reconstructive surgery should be delayed until the termination of puberty (8).

Juvenile or virginal hypertrophy

It is an aggregated rare form of normal breast hypertrophy mostly seen in adolescent girls, causing some physical problems such as posture disturbances, back pain or psychologic distress which are main indications for corrective surgery. As a reason, excessive end organ sensitivity to gonadal hormones is under discussion (1, 6). Using supportive brassieres, medical approach or corrective surgery are the treatment steps (1).

Infections

Mastitis may occur in newborns and adolescents. Irritation, trauma, foreign body, or anatomical defects as ductal ectasia or cystic lesions may cause infections. If fever, pain and other accompanying inflammatory findings exist, the condition is then diagnosed clinically. Ultrasonography is needed for further evaluation in doubtful cases. Antibiotics targeting staphylococcus aureus and gram-negative bacilli are initially recommended but if abscesses occur, drainage should be practiced (1, 9).

Nipple discharge

Nipple discharge is a rare condition in children. Although milky, sticky and thick discharge is mostly benign, purulent, serous or bloody discharge should be evaluated (1, 6, 8, 10). Galactorrhea might be a sign of prolactinoma, hypothyroidism, drug use and pregnancy should be kept in mind in adolescents as well. It is not infrequent in adolescent athletes to observe bloody discharge due to chronical stimulation of the nipple but cytology is essential in these cases to exclude the possibility of intraductal papilloma (1, 6, 10).

Mastalgia

In adolescents, premenstrual pains, benign growth pains or pains due to heavy exercise are observed frequently.

The use of soft brassieres, keeping warm, limitation of heavy exercise, drinking caffeine or acidic beverages and smoking are frequently workable precautions. If the pain is severe, nonsteroidal anti-inflammatory drugs or topicals are the first line drugs, and in some cases oral contraceptives are useful (1).

Breast Masses

Fibrocystic changes

Cysts are the most common masses in the pediatric population. At least 50 percent of women experience fibrocystic changes in their whole reproductive period (6, 10). Easily palpated fibrotic tissue usually exists in the upper outer quadrants of the breast usually. The size and the degree of pain vary parallel to menstrual cycle changes while the etiology of the condition is related to the imbalance between estrogen and progesterone hormones (1, 6). Mostly history and physical examination is enough for diagnosis. Breast ultrasonography is rarely required. Aspiration is performed if the gravity persists or increases; cytology is needed for bloody content. To relieve symptoms, nonsteroidal anti-inflammatory drugs especially ibuprofen is recommended in adolescents. Limiting caffeine intake can be helpful and oral contraceptives could be used in special circumstances (1, 2)

Fibroadenomas

These are most extreme breast masses in adolescents, frequently occurring in the upper outer part of breasts as an exaggerated response to estrogen stimulation. The condition accounts for 30-50 percent and 44-94 percent of adolescent breast masses in medical and surgical series respectively and accounts 50 percent of all breast biopsies (6, 11). Fibroadenomas are easily diagnosed by palpation (approximately 2-3 cm in size (ranging 1-10 cm), consistency, texture, location and tenderness as they are well-circumscribed lesions. An ultrasonography (US) examination is needed in all cases (1, 6, 8, 10-13). Mammography is not indicated in adolescents, as the intense structure of breasts limit imaging and the radiation effect on the growing tissue (8, 12, 13).

Although the course is benign, nipple discharge, trauma to breasts, family history of breast diseases/malignancy and previous history of chest radiation should be inquired in detail in every case.

Periodical follow up with physical examination and US is usually enough, but 4% of the lesions grow and need core needle aspiration (1). Surgical excision is demonstrated if the mass persists to adulthood or reaches 5 cm which can lead to risk of developing giant fibroadenoma or cystosarcoma phyllodes (1, 2, 13). However, surgery should not be performed before confirmation of the lesion by breast core needle biopsy.

Breast trauma

Trauma to the breast may be observed through childhood (e.g. traditional practices to newborns' physiologic breast enlargement, bumps to breasts, heavy exercise, seatbelt injury) resulting in fat necrosis that resemble breast mass. Differential diagnosis is frequently made by history and physical examination, but as fat necrosis mimics breast malignancy, further evaluation with ultrasonography for the typical image is needed (10, 14-16). In some of the cases which the presentation is not definitive, biopsy is the choice.

Mammary duct ectasia

The condition is the stretching of subareolar ducts with fibrosis and inflammation with sticky, multicolored fluid that appears as a dark colored mass under the nipple (blue breast) being predisposed to infection (mastitis or breast abscess). Although it is a benign course and resolves spontaneously, sometimes a residual subareolar nodule may be left (1, 2).

Cysts of Montgomery

Montgomery glands/tubercles or Morgagni tubercles are rooted, small papillary processes in periareolar region and probably play a role in lactation. Obstruction of the glands may cause inflammation, asymptomatic cyst or brownish, clear discharge (1, 2). Diagnosis is made clinically and usually resolves spontaneously. In some difficult cases ultrasonographic confirmation is needed.

Malignant masses

Primary breast cancer is very rare in the pediatric population (1, 6, 8, 16, 17). According to the data taken from Surveillance Epidemiology and End Results (SEER) of USA, from the 2011 to 2015 list, in female adolescents aged 15-19 years, invasive breast cancer incidence is declared as 0.1/100,000 (5). Juvenile secretory carcinoma made up over 80 percent of the cases, followed by intraductal carcinoma. Rhabdomyosarcoma and lymphoma also may occur as a primary tumor of the breast. Cystosarcoma phyllodes is a very rare condition having the potential of rapid growth and mimicking giant fibroadenomas (1, 12, 13). Juvenile papillomatosis has the potential of breast cancer in 15% of cases and should be treated surgically (1).

Primary finding of breast cancer in adolescents is a hard and irregular mass sometimes being fixed on underlying tissue. Also, skin or nipple involvement, retraction, discharge or skin edema (peau d'orange) and lymphadenopathy in neighbourhood could be observed (1, 17).

Risk factors such as familial history, history of previous individual cancer and exposure of the chest to radiation therapy or personal habits such as; alcohol consumption, limited physical activity or smoking, should be kept in mind.

The diagnosis is made by US with a proceeding biopsy from the mass. Accompanying lymph nodes and distant organ/system metastasis should be evaluated according to the stage of the disease (1, 17).

Metastatic cancer

Metastatic cancer to the breast are usually found due to existing states of rhabdomyosarcoma, Hodgkin and non-Hodgkin lymphoma, hepatocellular carcinoma and neuroblastomas (1,18).

Secondary cancer

Relapsing acute lymphoblastic leukemias, carcinomas of breast or previous chest radiation from another disease such as Hodgkin lymphoma are the causes of secondary cancers (1, 19, 20).

Management of breast masses in children;

1. Taking careful history; duration of the complaint, primary size or any increase in the mass, trauma, previous individual or familial breast disease or malignancy, previous chest radiation therapy, use of any drugs, pregnancy history or menstrual cycle regularity in adolescents.
2. Physical examination; location, size, being cystic/solid lesion, mobile/fixed, tender, inflammation criterion, skin changes, nipple discharge or attending lymphadenopathy or organomegaly.

3. Imaging; for persistent, atypical or extraordinary localized masses ultrasonography is preferred as the accuracy of the device in experienced hands when differentiating solid from cystic lesions is 96-100%. Mammography is not used in childhood breast diseases routinely, but for the girls who had received chest radiation for any kind of cancer are recommended to start mammography screening at 25 years of age or 8 years after therapy whichever comes last. Breast MRI can be added to the screening in these cases.

4. Surgical procedures; persistent cystic lesions need aspiration (bloody material in the aspirate needs cytologic evaluation). In the case of cystic lesions which do not resolve after aspiration, suspicious masses (unusual localization, fixed next to tissue, hard character etc.) or which, lymphadenopathy and/or hepatosplenomegaly accompany, surgical resection is demonstrated.

5. Therapy depends and varies upon the type of breast disease.

Conclusion

Breast masses during childhood are mostly benign, transient conditions. Physiologic hormonal changes, benign growth, cysts, some congenital anomaly/variants or syndromes, traumas and rarely malignancies may cause breast problems. Every physician interested in child health should implement checking of the breasts as a part of a routine physical examination and should have a command of breast physiology, development, variant conditions as well as pathological courses.

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