Breast Masses In Children

Çocukluk Çağı Meme Kitleleri

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ABSTRACT

Objective: The overwhelming majority of breast masses in children are benign. In this paper we aimed to evaluate the breast masses in children.
Methods: All children younger than 18, who were diagnosed with breast mass and were admitted to our center between March 2012 and March 2014 were analyzed for age, gender, complaint, the history of malignancy, the localization of breast mass, sonographic and pathological findings, and the diagnosis, retrospectively.
Results: Twenty-nine girls and 8 boys (age ranges from 5 to 18) were admitted to our center with breast mass within the last two years. Except for mass, 5 patients had pain, and 8 patients had nipple discharge. Two patients had family history of breast cancer. Three patients had an operation of mass excision. Histopathological diagnosis of two patients were juvenile fibroadenoma, and pseudoangiomatous stromal hyperplasia. Other diagnoses according to clinical and sonographic features were: Fibroadenoma 11, gynecomastia 8, breast abscess 6, premature thelarche 3, mammary duct ectasia 2, accessory breast 1, fibrocystic change 1 and adenosis 1. Patients were followed up with ultrasound and none of them developed malignacy.
Conclusion: The prevalence of breast cancer in the pediatric age group is extremely low, so a conservative approach of clinical and sonographic follow-up is more commonly adopted in children.

Key Words: Children, breast masses

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ÖZET

Amaç: Çocukluk çağı meme kitlelerinin büyük çoğunluğu benigndir. Bu makalede, çocukluk çağı meme kitlelerini incelenmeyi amaçladık.
Yöntemler: Son iki yılda hastanemize memede kitle ön tanısıyla başvuran 18 yaş ve altı hastalar geriye dönük olarak incelendi. Hastaların yaş, cinsiyet, başvuru şikâyeti, aile öyküsü, kitlenin yeri, fizik muayene bulguları, radyolojik bulgu ve tanıları, histopatolojik inceleme sonuçları kaydedildi.
Bulgular: Mart 2012- Mart 2014 tarihleri arasında 37 hasta memede kitle ön tanısıyla başvurdu. Hastaların yaş dağılımı 5-18 yıl idi. Yirmidokuz hasta kız, 8 hasta erkekti. Kitle dışında 5 hastada memede ağrı, 8 hastada meme başından akıntı şikâyeti vardı. İki hastada ailede meme kanseri öyküsü vardı. Üç hastada kitle ekzisyonu gerçekleştirildi. Bu hastaların ikisi juvenil fibroadenom, malignansi öyküsü bulunan bir hasta ise psödoanjiomatozis stromalı hiperplazi tanısı aldı. Biyopsi yapılan bir hasta juvenil fibroadenom tanısı aldı. Diğer hastaların klinik ve radyolojik bulgulara göre tanıları: 11 fibroadenom, 8 jinekomasti, 6 abse, 3 prematür telarş, 2 duktal ektazi, 1 aksesuar meme, 1 adenozis ve 1 fibrokistik lezyon. Hastaların takipleri ultrason ile yapıldı. Hastalardan hiç biri malignite tanısı almadı.
Tartışma: Çocuk ve adolesanda meme kitlelerinin çoğunun benign olduğu düşünülürse USG ile düzenli takip tercih edilmelidir. Progresif büyüme, izlemde küçülmeme, kompleks USG bulguları, ailede meme kanseri öyküsü ve geçirilmiş malignite öyküsü durumunda ekzisyonel biyopsi tercih edilmelidir.

Anahtar Sözcükler: Çocuk, adölesan, meme kitleleri

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INTRODUCTION

Though breast masses are uncommon and most often benign in children and adolescents, they produce significant patient and family distress when they occur. The heightened awareness of breast cancer is the main cause of psychological stress, and this leads to increased sensitivity for pathologic breast conditions in childhood and adolescence. However, the diagnostic evaluation of children and adolescents presenting with breast masses differs substantially from that of an adult because of marked differences in breast cancer risk and breast architecture (1). In adults, 11 percent of breast masses represent breast cancer (2) while in adolescents, only 0.02 percent of surgically removed masses represent a breast malignancy (3, 4).

As most breast masses in children and adolescents are benign, a conservative approach is warranted. Diagnosis and treatment must be tailored to avoid damaging developing breast tissue, which can result in hypoplasia or aplasia (5). A thorough patient history and physical exam are essential for the evaluation of any breast mass. Patients should undergo a medical evaluation, which includes taking detailed medical and family histories, recording the occurrence of any previous breast-related issues, the history of any malignancy or mantle radiation, and constitutional symptoms. Providers should inquire about mass location, duration, change in size, whether it may be dependent on menses, associated pain or discharge, and the occurrence of any additional masses (6). The physical exam should also assess the size, the mobility, and the consistency of the mass. Attempts should be made to produce nipple discharge. the palpation of the axillary lymph nodes should also be performed (7).

The preferred imaging modality in children and adolescents is breast ultrasonography, which has wide acceptance because of its lack of radiation hazards (8, 9). Magnetic resonance imaging (MRI) and mammography are alternative techniques, but have not been recommended for use in young patients due to the density of breast tissue in this population (10, 11). Moreover, during the time of differentiation, the growing breast seems to be more sensitive to radiation. Fine needle aspiration biopsy or core needle biopsy may be insufficient and bear the risk of iatrogenic damage to developing breast tissue, potentially leading to long-term defects (12). For these reasons management of breast masses is conservative and guided by clinical diagnosis and close follow-ups. The purpose of this study was to describe the management of breast masses in children and adolescents in our pediatric oncology unit.

METHODS

We retrospectively reviewed findings in children and adolescents who were younger than 18 and were diagnosed with a breast mass between March 2012 and March 2014 in our hospital. Information recorded for each patient included age, gender, complaint, history of malignancy, duration of symptoms, localization and size of the mass, sonographic and pathological findings, and diagnosis.

RESULTS

Thirty-seven patients were admitted to our center with a breast mass within the last two years. (Table 1) The mean age was 14.6 years (range 5 to 18 years). The female to male ratio was 3.6:1 (29 girls and 8 boys). The onset of the symptoms varied from 2 days to one year (mean 27 days). Sixteen patients were admitted with a complaint of mass in the right breast, 16 patients had a left-breast mass, and the remaining 5 patients had bilateral breast masses. Also 5 patients had a complaint of pain, 8 patients had a nipple discharge. Two patients had a known family history of breast cancer. One patient was diagnosed with embryonal rhabdomyosarcoma in the past and she had been in remission for 5 years.

Table 1: Clinical and radiological characteristics of patients.

Diagnosis	N	Symptom	Mass size	Side	Complex US finding	Positive History	Surgery or biopsy
Fibroadenoma	11	Mass-11	1cm-3.5 cm	R:5 L:6	BI-RADS 3: 4	Breast Ca 1	-
Juvenile Fibroadenoma	3	Mass-3	3.5cm-10cm	R:1 L:1 B:1	BI-RADS 4: 2	Breast Ca 1	Surgery: 2 Biopsy: 1
Gynecomastia	8	Mass-8	1 cm-3 cm	R:2 L:3 B:3	-	-	-
Breast abscess	6	Mass-6 Pain-3 Nipple discharge-6	1.2cm-2.5cm	R:2 L:4	-	-	-
Premature thelarche	3	Mass-3	1 cm-3 cm	R:3	-	-	-
Mammary duct ectasia	2	Mass-2 Nipple discharge-2	2 cm- 2.5 cm	R:1 L:1	-	-	-
PASH	1	Mass-1 Pain-1	1.5 cm	L:1	-	Rhabdomyo-sarcoma	Surgery:1
Adenosis	1	Mass-1 Pain-1	2.5 cm	B:1	-	-	-
Fibrocystic change	1	Mass-1	1 cm	R:1	-	-	-
Accessory breast	1	Mass-1	2 cm	R:1	-	-	-
Total	37	Mass-37 Pain-5 Nipple discharge-8	-	R:16 L:16 B:5	-	-	-

All masses were palpable and physical examination revealed breast masses on retroareolar in 17 patients, on the upper-outer quadrant of the left breast in three patients and of the right breast in six patients, on the lower-outer quadrant of the left breast in two patients and of the right breast in three patients, on the upper-inner quadrant of the left breast in two patients, on the lower-inner quadrant of the left breast in two patients and of the right breast in one patient. The remaining one patient had a large mass extending to all four quadrants of the left breast.

Breast ultrasonography was applied to all patients. The longest diameter of the breast masses ranged from 1 cm to 10 cm with a mean length of 2.5 cm. According to BI-RADS (Breast Imaging Reporting and Data System) classification, four patients had a category 3 and two patients had a category 4 mass. Three patients had an operation of mass excision. One of these patients was in a BI-RADS 4, and the other was in a BI-RADS 3 category. This patient's mass was more than 5 cm. Histopathologic diagnosis of two patients were juvenile fibroadenoma. Pathologic diagnosis of a third patient who had a malignancy history was pseudoangiomatous stromal hyperplasia (PASH). Fine needle aspiration was performed on one patient who had BI-RADS category 4, bilateral large breast masses, which were 10 cm in maximum diameter. Histopathologic diagnosis revealed juvenile fibroadenoma. The other patients' diagnoses according to clinical and sonographic features were: Fibroadenoma 11 patients (29%), gynecomastia 8 patients (21%), breast abscess 6 patients (16%), premature thelarche three patients (8%), mammary duct ectasia two patients (5%), accessory breast one patient, fibrocystic change one patient and adenosis one patient.

Patients were followed up closely with ultrasound, and none of them developed malignancy.

DISCUSSION

The differential diagnosis for pediatric breast masses is similar to those in adults, and includes fibroadenoma (and juvenile fibroadenoma), abscesses, benign cysts, phyllodes tumors, mammary duct ectasia, proliferative disease, primary breast cancer, sarcoma, lymphangioma or hemangioma and metastatic cancer. In a review of adolescent studies since 1960, fibroadenomas constituted the vast majority (30-50%) of medically diagnosed masses prior to surgery, followed by fibrocystic change (1.4-13%), benign phyllodestumor (0-17%), mastitis/abscess (0-7%), and proliferative disease (0-7%), with a malignancy found in 3.3 to 5.4% of the cases (13). Malignant breast masses are usually metastases or stromal malignancies rather than breast cancer (14). Although we have included males and prepubertal children in our study as something different from what was done in the literature; fibroadenomas constituted the vast majority (29%) of our case as in the literature. Fibroadenoma is a benign mass caused by overgrowth of the specialized connective tissue stroma of the breast lobule (5). They present as firm, nontender, clearly demarcated masses which are usually 2 to 3 cm in size, though they may range from <1 cm to greater than 10 (6). These estrogen-sensitive tumors are generally not seen before puberty. All fibroadenomas were also postpubertal in our study group. Management is controversial and varies among institutions. If the sonographic appearance is classic and the lesion does not show rapid growth, short-term follow-up ultrasound can be used to monitor the mass, because most remain static in size or resolve spontaneously (15, 1). The number of sonographic examinations of fibroadenomas varied from 2 to 6 (mean = 2.55) in this study and 9 of 11 fibroadenomas remained static in size, while 2 of them resolved spontaneously.

Gynecomastia is a benign and usually self-limited condition in children which occurs often during the neonatal period and puberty. This entity is uncommon in prepubertal boys, and often it is associated with endocrine syndromes or tumors (16). At puberty, two-thirds to three-fourths of boys have some degree of breast enlargement, which peaks at 13-14 years and usually resolves within two years (10, 17). The age of eight patients (21%) diagnosed with gynecomastia in our series varied between 9 to 15 years (mean = 13 years). The testicular examination and sex hormone profiles of all patients were normal.

Breast infections may occur in the pediatric and adolescent period. The infectious agent is usually Streptococcus or Staphylococcus. Ultrasound is helpful in diagnosis. An abscess can be diagnosed when a round, oval or irregular hypo echoic collection is evident (5). Antibiotics, and, if a significant abscess is present, drainage, are used to treat infection. However inflammatory changes in retroareolar cysts do not require immediate surgical intervention. All six breast abscesses were retroareolar in our series and they all had nipple discharge. The longest diameter of the lesions ranged from 12 mm to 25 mm in ultrasound examinations. All patients had been treated only with antibiotics, thus conservative treatment was sufficient in our group and similar findings are reported in the literature (18).Premature thelarche is defined as an isolated breast development in females between the ages of 6 months and 9 years. Three patients were diagnosed with premature thelarche in our series. Ages of these patients ranged from 5 to 8 and all three patients presented with palpable subareolar masses. They were not associated with precocious puberty. Follow-up ultrasound examinations revealed that all three cases were benign and self-limited.

Juvenile fibroadenomas account for 7 to 8% of all fibroadenomas, which occur most often in African American adolescents, and present as rapidly growing masses with associated skin ulcerations and prominent veins (6, 7, 10). Clinically, their presentation is variable, ranging from small mobile painless masses to rapidly growing tumors. The sonographic features of a juvenile fibroadenoma may not differ significantly from those of a phyllodes tumor (19, 10). Thus, surgical excision may be performed if the mass is rapidly growing and /or symptomatic. Three patients were diagnosed with juvenile fibroadenoma in our series. Mass excision was performed in two of these patients. One of these patients had a breast mass greater than 5 cm. The other patient had a 3.5x2 cm, BI-RADS category 4 breast mass on the ultrasound examination. Fine needle aspiration was performed on the remaining patient who had BI-RADS category 4, bilateral large breast masses, which were 10 cm in maximum diameter. This patient also had cerebral palsy and her family did not agree to a mass excision. She is in regular follow-up in our unit. All three patients' histopathologic diagnosis was juvenile fibroadenoma that supported the ultrasonographic diagnosis.

Most often, the retroareolar ducts are involved and patients present with bloody nipple discharge in mammary duct ectasia (20). Two of our patients had ductal ectasia in retroareolar with a serious nipple discharge which was resolved by an antibiotic therapy.

PASH is a benign, hormonally stimulated myofibroblastic proliferation that can mimic fibroadenoma clinically and radiologically (21). PASH may grow rapidly in adolescents. These tumors are benign, but a recurrence rate of up to 18% has been reported (21, 22). Patient 1 had a rapidly growing painful mass which was diagnosed as fibroadenoma on ultrasound examination. Mass excision was performed and histopathologic examination revealed PASH. She is in regular follow-up and no recurrence has been detected for two years.

One patient had accessory breast, one patient had fibrocystic changes and the remaining patient had adenosis. Bilateral retroareolar fibroglandular tissue density was increased on the ultrasound examination of the last patient and was reported as adenosis. This patient is in close follow-up because the risk of developing breast cancer.

As we mentioned above the most important diagnostic imaging method is breast sonography in pediatric age; biopsy is rarely required for diagnosis. But the objective criteria were not defined for leading biopsy in children. BI-RADS is the standard tool used to grade the malignancy potential of breast imaging in adults. With this system, BI-RADS 4 or 5 and, less often, even 3 will lead to a biopsy (Table 2). But Kennedy et al. reported that the predictive value of BI-RADS classification for breast imaging in women under the age of 50 diminishes markedly (23). Thus BI-RADS classification system is not used routinely in sonographic examinations of breast masses in pediatric ages. Two patients with BI-RADS category 4 masses in our series had the diagnosis of juvenile fibroadenoma after a pathologic examination. More prospective clinical studies are needed to develop sonographic techniques for the evaluation of breast masses in pediatric-age groups.

Table 2: Breast imaging reporting and data system (BI-RADS) category.

Category	Assessment	Management
0	Incomplete	Need additional imaging
1	Negative	Annual follow-up
2	Benign	Annual follow-up
3	Probably benign	6 Month follow-up
4	Suspicious abnormality	Biopsy
5	Highly suspicious of malignancy	Biopsy and treatment
6	Known biopsy-proven malignancy	Complete / Adjust treatment

CONCLUSION

The prevalence of breast cancer in the pediatric age group is extremely low as compared with that in the adult population, so a conservative approach of clinical and sonographic follow-up is more commonly adopted for children. Histopathological examination is essential in patients with big size masses with no regression on follow-ups, and in patients who have a malignancy history, a maternal history of breast carcinoma and complex ultrasound findings.

Conflict of Interest

No conflict of interest was declared by the authors.

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