

Surgical Approach to Childhood Breast Masses

Çocukluk Çağı Meme Kitlelerine Cerrahi Yaklaşım

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ABSTRACT

Objective: We aimed to investigate the epidemiological and characteristic features of patients treated for breast masses in our clinic and share our experiences.

Material and Methods: Patient records were reviewed retrospectively. Demographic and clinical data were investigated. The patients were divided into those who were operated on at the first admission (group 1) and those who were operated on after the follow-up (group 2) and compared. The statistical analysis evaluated with SPSS version 21. $p < 0.05$ was considered significant.

Results: Forty-eight patients who were operated on for breast mass in 10 years were included in the study. There was no difference between the groups regarding mean age and complaints at presentation ($p=0.723$, $P=0.555$, respectively). Ultrasound was performed on all patients. It was observed that the masses were located more frequently in the right breast in Group 1 (58.3%) and the left breast in Group 2 ($p=0.386$). In addition, it was noticed that the masses were most frequently located in the upper lateral quadrant of the breast in both groups (62.5% and 70.89%, respectively). The longest diameters of the masses were longer in group 1 than in group 2 (51.79 ± 11.11 mm and 35.16 ± 3.74 mm, respectively, $p < 0.001$). Radiologically, most of the masses were reported as Breast Imaging Reporting and Data System (BI-RADS 3) in both groups (41.7% and 54.2%, respectively, $p=0.444$). Fine-needle aspiration biopsy (FNAB) was performed on nine patients in Group 1 and one in Group 2 ($p=0.004$). According to the FNAB reports, phyllodes tumors were detected in two patients, while the others were reported as fibroadenoma. The most common fibroadenomas were detected in the histopathological evaluations after surgical excision. In addition, a premalignant breast mass was detected in 6.2% of all patients.

Conclusion: We recommend surgical excision in children with large, rapidly growing breast masses or suspected phyllodes tumors.

Key Words: Breast masses, Child, Fibroadenoma, Phyllodes tumor

ÖZ

Amaç: Kliniğimizde meme kitleleri nedeniyle tedavi edilen hastaların epidemiyolojik ve karakteristik özelliklerini araştırmayı ve deneyimlerimizi paylaşmayı amaçladık.



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Gereç ve Yöntemler: Hasta kayıtları geriye dönük olarak incelendi. Demografik ve klinik veriler araştırıldı. Hastalar ilk başvuruda ameliyat edilenler (Grup 1) ve takip sonrası ameliyat edilenler (Grup 2) olarak ayrılarak karşılaştırıldı. İstatistiksel analiz SPSS 21 sürümü ile değerlendirildi. $p < 0.05$ anlamlı kabul edildi.

Bulgular: Çalışmaya 10 yılda meme kitlesi nedeniyle ameliyat edilen 48 hasta dahil edildi. Ortalama yaş ve başvuru şikayetleri açısından gruplar arasında fark yoktu (sırasıyla $p=0.723$, $p=0.555$). Tüm hastalara ultrason yapıldı. Kitlelerin, Grup 1'de sağ memede (%58.3), Grup 2'de sol memede ($p=0.386$) daha sık yerleşim gösterdiği gözlemlendi. Ayrıca her iki grupta da kitlelerin en sık meme üst lateral kadranda yerleştiği görüldü (sırasıyla %62.5 ve %70.89). Kitlelerin uzun çapları grup 1'de grup 2'ye göre daha uzundu (sırasıyla 51.79 ± 11.11 mm ve 35.16 ± 3.74 mm, $p < 0.001$). Radyolojik olarak her iki grupta da kitlelerin çoğu Breast Imaging Reporting and Data System (BI-RADS 3) olarak raporlandı (sırasıyla %41.7 ve %54.2, $p=0.444$). Grup 1'deki 9, Grup 2'deki 1 hastaya ince iğne aspirasyon biyopsisi (İİAB) yapıldı ($p=0.004$). İİAB 'de iki hastada filloid tümör saptanırken, diğerleri fibroadenom olarak rapor edildi. Cerrahi eksizyon sonrası histopatolojik değerlendirmelerde en sık fibroadenom tespit edildi. Ayrıca tüm hastaların %6.2'sinde premalign meme kitlesi saptandı.

Sonuç: Çocuklarda, büyük boyutta, hızlı büyüyen veya filloid tümör şüphesi olan meme kitlelerinde cerrahi eksizyon öneriyoruz.

Anahtar Sözcükler: Meme kitlesi, Çocuk, Fibroadenom, Filloid Tümör

INTRODUCTION

Although the incidence of breast masses is low in children, it is a significant cause of admittance to pediatric surgery in adolescent girls (1). Commonly, the patients admit after they notice the mass on their own. These masses constitute a wide spectrum of anomalies between inflammatory and tumoral conditions (2).

Most of the masses in children and adolescents are benign and almost all are fibroadenomas. Fibroadenomas are the most common breast conditions in adolescents which grow slowly and tend to regress with increasing age. They commonly appear as 2-3 cm, non-tender mobile masses. They can demonstrate relatively rapid enlargement in adolescents and pregnant individuals as they are responsive to estrogen (3). The incidence among adolescents and young adults is around 2.2% (4). Furthermore, fibroadenomas are the most common breast masses that undergo surgical intervention or biopsy (5).

Although the most common type is called as 'classical type', giant fibroadenomas can also be encountered in adolescents. A fibroadenoma larger than 5-10 cm is usually called as 'giant fibroadenoma'(2). Another breast tumor in children is the phyllodes tumor which is a fibroepithelial tumor that constitutes less than 1% of the breast masses of adolescents (6).

Several algorithms are developed for the management of breast masses in adults but, no standardized pathway exists for the evaluation, management and follow-up of such masses in children. The lack of an algorithm causes diverse clinical practices by different physicians. Therefore, we aimed to share our experience with the breast masses in children.

MATERIALS and METHODS

The study is designated as a retrospective review of the patient charts. The study was approved by Ankara City Hospital, No. 2 Clinical Research Ethics Committee (Date/No: 10.11.2021/E2-21-1011). The patients younger than 18 years old who

underwent a surgical procedure for a breast mass between 2011 and 2021 are enrolled in the study.

Data regarding the patients' age, admitting complaint, family history of breast mass, location of the mass defined by ultrasonography (US), longest diameter of the mass, Breast Imaging Reporting and Data System (BI-RADS) classification, preoperative biopsy, follow up duration, histological results, length of hospital stay, complications, recurrence and mortality were evaluated. Patients were divided into 2 groups; the patients who were operated on at the first admittance were enrolled in Group 1 and the patients who were operated after the follow-up visits were enrolled in Group 2. The demographics, clinical findings and results were evaluated and compared between the groups.

The masses smaller than 3 cm in diameter and that remained stable or shrank during follow-up were not operated and were excluded from the study. Surgical excision was offered at the admittance in patients who had a mass larger than 4 cm (Group 1). The masses between 3 to 4 cm were followed up regularly. During follow-up, surgery was offered if the mass did not shrink after 3 menstrual cycles, enlarged or demonstrated findings suggestive of malignancy on ultrasonography (Group 2).

Statistical analyses were performed by the Statistical Package for Social Sciences (SPSS) software version 21 (SPSS Inc, Chicago, IL, USA). Numerical variables were expressed as mean (\pm SD) and categorical variables were expressed as (%). Descriptive analyses for numerical variables were performed with the Mann Whitney U test as they were not distributed normally. Comparative analyses of the categorical variables were performed with Pearson's Chi-Square and Fisher's Exact test. A $p < 0.005$ value was considered statistically significant.

RESULTS

The girls who had undergone surgical intervention for breast masses are included in the study ($n=48$). The mean age of the patients was 15.59 ± 1.52 years in Group 1 and 15.56 ± 1.18 years in Group 2. Both groups were compared in terms of

Table I: Comparison of demographic and clinical data of the groups.

	Group 1	Group 2	p
Age(Years),*	15.59±1.52	15.56±1.18	0.723 [†]
Admission complaints, n (%)			
Palpable mass	23 (95.8)	22 (91.7)	0.555 [‡]
Mastodynia	1 (4.2)	2 (8.3)	
Follow up duration (month),*	-	3.87±1.65	N/A)
Length of stay at hospital (days),*	1.79±0.50	1.45±0.58	0.310 [†]

*Mean±SD, [†]Mann-Whitney U test used, [‡]Pearson Chi-Square test used

Table II: Comparison of US findings.

	Group 1	Group 2	p
Longest diameter of the mass (cm),*	51.79±11.11	35.16±3.74	<0.001
Side, [†]			
Right	14 (58.3)	11 (45.8)	0.386 [‡]
Left	10 (41.7)	13 (54.2)	
Location of the mass, [†]			
Upper lateral	15 (62.5)	17 (70.8)	0.207
Upper medial	4 (16.7)	-	
Lower lateral	4 (16.7)	6 (25)	
Lower medial	1 (4.2)	1 (4.2)	
BI-RADS, [†]			
BI-RADS-3	10 (41.7)	13 (54.2)	0.444 [§]
BI-RADS-4	5 (20.8)	6 (25)	
Not evaluated	9 (37.5)	5 (20.8)	

*Mean±SD, [†]n (%), [‡]Mann-Whitney U test used, [§]Pearson Chi-Square test used, ^{||}Fischer exact test used

age distribution ($p=0.723$). The most common complaint in admission was palpable breast mass and both groups were comparable in terms of admission complaints ($p=0.555$) (Table I). One patient had a family history of breast cancer (her aunt).

All patients underwent US examination at the initial admission. One patient with a mass resembling a phyllodes tumor on US underwent magnetic resonance imaging (MRI). No mammography was performed in any of the cases. No difference was found between the groups in terms of laterality of the lesions as the right breast was involved in 58.3% of patients in Group 1 and 45.8% in Group 2 ($p=0.386$). The most common involved area was the upper lateral quadrant in both groups (62.5% vs. 70.8% in Groups 1 and 2, respectively). The mean of the longest diameter of the masses measured by the US was significantly higher in Group 1 (51.79±11.11 mm in Group 1 and 35.16±3.74 in Group 2, $p<0.001$) (Table II).

Most of the masses in Group 1 and Group 2 were found as BI-RADS 3 stage according to the BI-RADS classification on US (41.7% and 54.2%, respectively). Five patients in Group 1 and 6 patients in Group 2 had BI-RADS-4 masses. No significant difference was observed between the groups in terms of BI-RADS stages ($p=0.444$) (Table II).

Table III: Comparison of histological findings

	Group 1	Group 2	p
Preoperative biopsy (FNAB), n (%)			
Yes	9 (37.5)	1 (4.2)	0.004
No	15 (62.5)	23 (95.8)	
Histological diagnosis, n (%) [*]			
Fibroadenoma	21 (87.5)	21 (87.5)	0.609 [†]
Phyllodes tumor	2 (8.3)	-	
Fibrocystic changes	1 (4.2)	1 (4.2)	
Tubular adenoma	-	1 (4.2)	
Juvenile papillomatosis	-	1 (4.2)	

*Cells with a value of zero were combined with the closest group for statistical analysis, [†]Fischer exact test used, **FNAB**: Fine needle aspiration biopsy.

Nine patients in Group 1 and 1 patient in Group 2 underwent FNAB. A significantly higher rate of patients received FNAB in Group 1 ($p=0.004$). FNAB results were inconclusive for phyllodes tumor in 2 patients (both in Group 1) but all others were compatible with fibroadenomas. The histopathological examination results of the masses of these patients after total excision were compatible with Phyllodes tumor and the surgical margin was negative (Table III).

Fibroadenoma was the most common histological diagnosis (Table III). Two patients in Group 1 had phyllodes tumor and 1 patient in Group 2 had juvenile papillomatosis which was considered as premalignant lesions (6.2%). The length of hospital stay was not different between the groups ($p=0.31$) (Table I). No complication, recurrence or mortality was observed in any of the patients.

DISCUSSION

Breast masses are challenging conditions in pediatric surgery practice as they are significantly rare but potentially may demonstrate malignant transformation later in life. The main cause of the challenge is the lack of systematic guidelines (7). Due to limited studies and sparsity of the conditions in children, no consensus exists regarding the optimal management in children. Immediate removal or follow-up of the existing mass is an important decision for the surgeon.

Breast masses are common sources of anxiety for the parents and the patients. Together with this anxiety, the management process becomes more complicated when limited personal experience of the attending physicians (radiologist, surgeon) are not compatible. In fact, there are studies suggesting that the most common indication for surgery is the anxiety of the patient and the parents (8).

US is commonly considered as a reliable diagnostic tool for breast masses in children. Rarely computerized tomography (CT) or MRI may be needed to evaluate the extent of the lesions. In children, mammography has almost no role in the evaluation of the breast masses (2, 9). Accordingly, we did not perform any

mammography in any of our patients. In accordance with the current literature, the most common site of the masses was the upper lateral quadrant in our study, too (10, 11).

BI-RADS classification is the most common tool for the evaluation of breast masses in adults and is preferred by most radiologists. However, there are studies that conclude that it is not a reliable tool for the evaluation of breast masses in children (1,8,12). Our results also support this conclusion as all masses with possible malign appearance according to BI-RADS classification in our study were finally diagnosed as fibroadenomas.

Another controversial issue in the management of breast masses in children is the indication of the FNAB. Some authors recommend FNAB for masses ≥ 3 cm diameter (13,14). On the other hand, some argue that the reliability of FNAB in the differential diagnosis of fibroadenoma/phyllodes tumor is limited and that normal breast tissue can be injured during FNAB attempts (7,15). The most commonly accepted indication for a biopsy is to determine the extent of the surgical resection in patients with presumed phyllodes tumor (7). We also preferred FNAB to decide the extent of the surgical resection in patients with presumed phyllodes tumor.

Although there are studies evaluating the relationship between the dimensions of the masses and the necessity for surgical intervention in children, there is no consensus or guidelines for the optimal management process. Some favor expectant management in masses smaller than 5 cm as most of them are benign (2,14,16). On the other hand, some predict an increased risk for phyllodes tumor in masses 3 cm or over, and recommend surgical removal (1,17-19). Our results are also similar as all patients ($n=2$) with a final diagnosis of phyllodes were in Group 1.

The most common breast mass confirmed histologically after surgical removal in children was fibroadenoma (1,17). Although most of the breast masses in children were benign, an unignorable 6.2% were malign or premalignant.

CONCLUSION

Surgical excision is recommended in children with a breast mass larger than 4 cm at the initial admission, rapid increase in diameter on follow-up, or when differentiation between phyllodes tumor and fibroadenoma is not possible by US. Additionally, preoperative FNAB can be helpful to decide the extent of the surgery.

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