



An Approach to Pediatric Breast Masses in View of the Current Literature

Güncel Literatür Eşliğinde Çocuk Yaş Grubu Meme Kitlelerine Yaklaşım

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Abstract

Aim: Although breast masses are uncommon in children and adolescents, it is a worrying phenomenon for families when diagnosed. Breast masses in this age group are generally benign and most of them are seen in adolescents. In this retrospective study, it was aimed to discuss the treatment approach to breast masses in the pediatric age group.

Material and Method: The patient information was obtained from the hospital records and automation system. The patients were retrospectively analyzed with regards to age, complaints and their duration, family history, association with menstruation, location and size of the breast mass, methods of diagnosis, histopathological findings, and postoperative complications.

Results: There was no difference between neoplastic group (NG) and non neoplastic group (NNG) with respect to median age, body mass index, side and location of the mass, reason for admission, association with puberty, and follow-up time ($p>0.05$). When both groups were compared in terms of the size of the mass, the mass size was measured to be 2.2 cm (1.4-3) in NNG and 3.8 cm (3-8) in NG. There was no statistically significant difference between the two groups ($p=0.12$).

Conclusion: Surgical excision will be appropriate when a pediatric breast mass is detected in the neoplastic group, there is a family history, the size of the mass does not change or increase during follow-up, and malignancy is suspected on imaging.

Keywords: Breast, mass, child

Öz

Amaç: Meme kitleleri çocuk ve ergen yaş grubunda ender görülmesine rağmen tespit edildiğinde aileler için oldukça endişe verici bir durumdur. Bu yaş grubunda ki meme kitleleri genelde iyi huyludur ve büyük bir kısmı ergenlik döneminde görülür. Bu geriye dönük çalışma ile çocuk yaş grubunda meme kitlelerine tedavi yaklaşımının tartışılması amaçlanmıştır.

Gereç ve Yöntem: Hastalara ait bilgiler hastane kayıtları ve otomasyon sisteminden elde edildi. Olgular yaş, başvuru yakınmaları ve süresi, aile öyküsü, menstruasyonla ilişkisi, meme kitlesinin yeri, büyüklüğü, tanıda kullanılan yöntemler, histopatolojik bulgular ve cerrahi sonrası komplikasyonlar bakımından geriye dönük olarak değerlendirildi.

Bulgular: Neoplastik grup (NG) ile neoplastik olmayan grup (NOG) arasında ortalama yaş, beden kitle indeksi, tespit edilen kitlenin tarafı ve lokalizasyonu, başvuru nedeni, puberte ile ilişki ve takip süresi bakımından fark saptanmadı ($p>0,05$). Her iki grup tespit edilen kitlenin boyutları açısından karşılaştırıldığında NOG da kitle boyutu 2,2 cm (1,4-3), NG da kitle boyutu 3,8 cm (3-8) ölçüldü. Her iki grup arasında istatistiksel olarak anlamlı bir fark saptanmadı ($p=0,12$).

Sonuç: Çocuk yaş grubunda memede neoplastik grup içerisinde değerlendirilen bir kitle tespit edildiğinde, aile hikayesinin olması, kitlenin takip boyunca boyutlarında değişiklik olmaması veya artması, görüntüleme de malignite şüphesi bulunması durumunda cerrahi eksizyon uygun olacaktır.

Anahtar Kelimeler: Meme, kitle, çocuk



INTRODUCTION

Although breast masses are uncommon in children and adolescents, it is a worrying phenomenon for families when diagnosed. Breast masses in this age group are generally benign and most of them are seen in adolescents.^[1] The probability of pediatric breast masses becoming malignant is reported as 0.3%. Malignant breast masses constitute less than 1% of all childhood cancers.^[2] Ultrasonography is the most commonly used imaging method in the differential diagnosis of breast masses in children, unlike adults. Mammography is not preferred in pediatric cases due to high breast density and exposure to ionizing radiation.^[3] Breast masses that are benign may regress spontaneously in children. Therefore, most of the cases may require close follow-up.^[4] There are very few studies in the literature conducted on the algorithm that can be used in the follow-up and treatment of pediatric breast masses. The present study aimed to retrospectively analyze the data of patients who were admitted to the pediatric surgery clinic due to breast mass, and to present the results by discussing them in view of the current literature.

MATERIAL AND METHOD

The study included patients younger than 18 years of age who were admitted to the Pediatric Surgery Clinic between January 2015 and June 2020 due to complaints of breast mass. The patient information was obtained from the hospital records and automation system. The patients were retrospectively analyzed with regards to age, complaints and their duration, family history, association with menstruation, location and size of the breast mass, methods of diagnosis, histopathological findings, and postoperative complications. As a result of examination, and laboratory, imaging and histopathological evaluation, cases diagnosed with ductal ectasia, fibrocystic disease, mastitis and abscess secondary to trauma are included in the non-neoplastic group (NNG) and those diagnosed with fibro adenoma, haemangioma, juvenile papillomatosis, intraductal papilloma in the neoplastic group (NG). Categorical variables were reported as frequency and percentage. Continuous variables were analyzed to see whether they show normal distribution using histogram, and they were reported as median and range. Ordinal and continuous variables were compared using the Mann-Whitney test and the chi-square test. SPSS software (IBM SPSS Statistics, version 25, IBM Corp, Armonk, NY, USA, 2017) was used for statistical analysis. A P value <0.05 was considered statistically significant. The study was approved by the Ethics Committee of Health Sciences University, Kocaeli Derince Training and Research Hospital with the decision no. 2020/170. All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

RESULTS

63 patients were included in the study and all cases were female. As a result of the analysis, 41 cases were evaluated as NNG and 22 cases as NG. The median age of the non-neoplastic group (NNG) was 13.4 (0-18 years) and the median of the neoplastic group (NG) was 13.5 years (10-18 years). The most common reason for admission in NNG and NG was palpable breast mass (56%, 59% respectively). The median duration of complaint in NNG before the admission was 1.4 months (0.5-6 months), and it was determined to be 1.3 months for NG (0.5-6 months). Thirty-four cases (82.9%) were in post pubertal period when mass was diagnosed in NNG while 15 cases (59%) were in post pubertal period when mass was detected in NG. Family history was detected in three cases in NG. There was a history of breast trauma in four cases in NNG. The median follow-up time was 2.1 months (1-4) for NNG while it was 1.5 months (0-4) for NG.

There was no difference between NNG and NG with respect to median age, side and location of the mass, reason for admission, association with puberty, and follow-up time ($p>0.05$) (**Table 1**).

Ultrasonography was performed in all cases as the first imaging examination. MRI was used for differential diagnosis in 16 (25.3%) patients with masses more than 3cm in size, multiple masses, and increase in size during follow-up.

When both groups were compared in terms of the size of the mass, the mass size was measured to be 2.2 cm (1.4-3) in NNG and 3.8 cm (3-8) in NG. There was no statistically significant difference between the two groups ($p=0.12$).

When 22 cases who underwent mass excision were examined, the size of the mass was bigger than 3cm in nine cases (40.9%), an increase in mass size was detected in seven cases (31.8%) after menstrual period during follow-up, and six cases (27.2%) were suspected of malignancy with imaging methods, and total surgical excision was performed for histopathological diagnosis of breast masses.

In the final postoperative histopathology reports, the histopathological diagnosis of 14 patients (63.6%) was reported to be fibro adenoma, four cases (18.1%) to be hamartoma, and four cases (18.1%) to be juvenile papillomatosis.

No complications or recurrence were detected in the patients who underwent surgery during the postoperative follow-up.

Eight cases with breast rash, erythema, pain and tenderness on physical examination of NNG who were evaluated as mastitis and breast abscess were treated with antibiotic and anti-inflammatory agents without drainage or aspiration. The complaints of breast abscess and mastitis were disappeared at the follow-up one week later (**Table 1**).

Table 1. Characteristics of pediatric breast masses

Variable		NNG (n,%)	NG(n,%)	p	
Number of Cases (n,%)	(63, 100%)	41 (65%)	22 (35%)	0.22	
Age (median,years)		13.4 (0-18)	13.5 (10-18)	0.67	
Admission Symptoms	Palpable Mass	23 (56.0%)	13 (59%)	0.26	
	Pain	7 (17.0%)	6 (27.2%)	0.42	
	Swelling and Rash	8 (19.5%)	0		
	Discharge	3 (7.3%)	3 (13.6%)	0.46	
Menstrual Condition	Postpubertal	34 (82.9%)	13 (59.0%)	0.23	
	Prepubertal	7 (9.7%)	9 (41.0%)	0.36	
Family History	Yes	5 (12.1%)	3 (13.6%)	0.86	
	No	36 (87.8%)	19 (86.3%)	0.75	
Location of the Breast Mass	Right (25, 39.6%)	Upper external	7	3	0.32
		Upper internal	5	3	
		Lower external	3	1	
	Left (32, 50.7%)	Bottom internal	2	1	0.45
		Upper external	9	4	
		Upper internal	7	3	
		Lower external	4	2	
	Multiple (4, 6.3%)	Bottom internal	1	2	
			3	1	
	Imaging	USG	40 (97.5%)	21 (95.4%)	0.57
MRI		7 (17.0%)	9 (40.9%)	0.64	
Size (cm)		2.2 (1.4-3)	3.8 (3-8)	0.22	

DISCUSSION

Pediatric breast masses are mostly benign, and current literature supports the safety of clinical observation in this population, at least as an initial management step.

Tea et al. have reported that operation occurs due to breast mass at an average age of 16.^[5] Our study found the median age to be 13.4 years in NNG, and the median age of the patients in NG to be 13.5 years, which is similar to the results in the literature.

When the literature was reviewed, no significant difference was reported between right and left breast involvement.^[6,7] In our study, the most common location was the left upper quadrant while no significant difference was found between the right and left breast.

A complete and detailed history and physical examination are crucial for the diagnosis of pediatric breast masses. Ultrasonography is important among imaging methods and the best diagnostic tool for any palpable breast mass in this age group. Ultrasound enables accurate measurements of breast masses and helps to monitor increase in size. However, the place of the BI-RADS classification has not yet been proven in the pediatric population. Koning et al. concluded that this classification may increase the risk of malignancy or surgical procedure in the pediatric age group.^[8]

Mammography is not used routinely in the young as the pediatric breast is denser than that of an adult, which may limit the sensitivity of mammography. Mammography also uses ionizing radiation and the principle of exposure to radiation in a young population is to maintain the radiation

level as low as reasonably achievable. Computed tomography and magnetic resonance imaging (MRI) are helpful in that they can be utilized in characterizing breast masses when sonography is not suitable and in evaluating the extent of metastatic disease or primary tumour for surgical planning.^[9] The present study used MRI for differential diagnosis in 16 (25.3%) patients with masses more than 3 cm in size, multiple masses, and increase in size during follow-up.

As known from the literature, the most common benign breast tumour in adolescents is fibro adenoma, which accounts for 68% of all breast masses.^[10] In our study group, 81.7% of all breast masses that were completely removed were reported to be fibro adenoma and juvenile fibro adenoma.

Neoplastic breast masses should be suspected to be benign if they show smooth, well-defined circumscribed hyper echoic or slightly hypo echoic, thin echogenic capsule, ellipsoid or less lobulation in imaging studies. Malignant breast masses were evaluated as those that are larger, elongated masses with micro calcification, posterior acoustic shadowing, and hypo echoic nodular lesions.^[11]

When the literature was examined, no significant difference was observed between sizes in studies conducted on the size of breast masses undergoing surgery.^[5-7] The smallest mass in our study was measured to be 3cm while the largest one to be 8 cm in NG who underwent surgery.

Ezer et al.^[7] reported the period of admission to the clinic due to breast mass to be one month. In our study, the admission period for NG was determined to be 1.3 months.

Some researchers advocate removing all the fibro adenomas while some others argue that fibro adenomas can be followed up in periods considering the low incidence of breast cancer in adolescents.^[14] When the literature is reviewed, surgery is recommended for patients who experience increase in size rather than decrease during follow-up, have complicated USG findings, have a family history of breast cancer, and have a history of malignancy.^[6,7,15,16] The average follow-up period of cases with breast masses is 7.4 months. Among the indications for surgery, the most common reason is suspicion of malignancy (65%). This is followed by the mass that did not disappear in the follow-up (25%), increase in mass size (5%), and multiple masses (5%).

Although the risk of malignancy in pediatric breast masses is very low, this possibility should be kept in mind during follow-up due to the risk of developing carcinoma from the epithelial region reported as 0.1-0.3%.^[18] The present study detected no malignant mass in NG cases that underwent surgery, and observed no recurrence or complications during the follow-up.

Although the treatment of giant fibro adenomas and juvenile fibro adenomas is recommended to be carried out without surgery, the epithelium of juvenile fibro adenomas being sometimes shown at the border suggests that benign pediatric breast masses should be treated surgically. It should note that the follow-up of mass is not a form of treatment.^[19]

This study has certain limitations. The study was conducted by scanning records retrospectively and the number of patient groups is low. There is a need for prospective studies with a wider patient group on this subject.

CONCLUSION

In children, it is of almost importance to avoid unnecessary surgical intervention in order not to damage the developing breast tissue and not to adversely affect the patient's psychology. On the other hand, surgical excision will be appropriate when a pediatric breast mass is detected in the neoplastic group, there is a family history, the size of the mass does not change or increase during follow-up, and malignancy is suspected on imaging.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was approved by the Ethics Committee of SBÜ Kocaeli Derince Training and Research Hospital with the decision no. 2020/170.

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

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