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Pediatric breast masses: an argument for observation



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ABSTRACT

Background: Pediatric breast masses can be a diagnostic challenge. Nearly all are benign, but there is no consensus on which should be removed. We hypothesized that children with asymptomatic breast lesions can be safely managed nonoperatively.

Methods: We performed a single-institution retrospective review of children (≤ 18 y) who underwent breast mass excision from 2008 to 2016. Male patients with gynecomastia and those who had needle biopsy without formal excision were excluded. Pearson correlation was used to compare ultrasound and pathologic size. Kruskal–Wallis test was used to compare size and final diagnosis.

Results: One hundred ninety-six patients were included (96% female). Mean age was 15 ± 3 y. Most patients (71%) presented with a painless mass. Preoperative ultrasound was obtained in 70%. Pathology included fibroadenoma (81.5%), tubular adenoma (5%), benign phyllodes tumor (3%), benign fibroepithelial neoplasm (0.5%), and other benign lesions (10%). There were no malignant lesions. Ultrasound size had a Pearson correlation of 0.84 with pathologic size ($P < 0.0001$). There was no association between the size and final diagnosis.

Conclusions: Over 9 y, all pediatric breast masses removed at a single center were benign, most commonly fibroadenoma. Ultrasound was an accurate predictor of size, but large lesions did not necessarily confer a high malignancy risk. Observation is appropriate for asymptomatic breast masses in children. Decision for surgery should be individualized and not based on size alone.

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Introduction

Pediatric breast masses are relatively rare, although when present can be the source of significant anxiety for the patient and

their family. Frequently breast masses pose a diagnostic dilemma for the surgeon as the malignancy rate is low, and imaging studies are limited with mammography rarely being of benefit. Most patients present during their pubertal years and

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the overwhelming majority have benign disease,¹⁻³ most commonly fibroadenoma.^{1,3-6} However, malignant breast lesions have been reported, and this possibility needs to be considered during the workup.^{1,6-8} In general, indications for surgery include rapid growth of the lesion, mass size >5 cm, those causing significant symptoms, and patients with a personal history and/or a strong family history of malignancy.⁹ However, there are no consensus recommendations regarding which children should undergo breast mass excision for presumably benign disease, leading to varied practice patterns.

We hypothesized that children with asymptomatic breast lesions can be safely managed nonoperatively. The primary objective of this study was to determine whether clinical and/or radiographic characteristics could be used to predict final pathologic diagnosis and help guide the decision for surgical excision.

Methods

Study design and patient selection

After obtaining approval from our institutional review board, a retrospective review of all pediatric patients (≤ 18 y) who had breast masses removed at Children's Medical Center of Dallas from 2008 to 2016 was performed. Patients were included if they had a breast mass excised in the operating room with a corresponding pathology report. Patients who were simply observed ($n = 3$), underwent incision and drainage or debridement ($n = 2$), male patients with gynecomastia ($n = 4$), and patients who underwent needle biopsy without formal excision ($n = 18$) were excluded.

Data collection

Patient demographics and history including age, gender, weight, height, previous surgery, family history, and medications were recorded. In addition, breast mass–related data was obtained including any symptoms related to the mass, lesion location, presence of discharge or bleeding, and relevant physical exam findings. Preoperative ultrasound reports, when available, were used to document mass size, laterality, and qualitative characteristics based on radiologist interpretation. Preoperative biopsy pathology reports, when available, were recorded. All operative reports were reviewed to ascertain the type of procedure performed. Final surgical pathology reports were used to categorize diagnoses as fibroadenoma, phyllodes tumor, tubular adenoma, benign fibroepithelial lesion, and other benign lesion.

Statistical analysis

Categorical data were reported as counts and percentages, and continuous variables were reported as means with standard deviation. A Pearson correlation was used to compare age, body mass index (BMI), and ultrasound size with pathologic size. A Kruskal–Wallis test was used to compare lesion size with pathologic diagnosis. All comparisons were two-tailed, with $\alpha = 0.05$ considered statistically significant. Statistical analyses were performed using SAS 9.4 software (Cary, NC).

Results

A total of 196 patients (96% female) were included in our study (Table 1). The mean age at the time of surgery was 15 ± 3 y, with most patients between 11–18 y old. Ethnicity was reported as 43% Hispanic, 42% African American, 10% Caucasian, and 5% other. Mean weight was 56 ± 13 kg and BMI 22.4 ± 4 kg/m².

On initial surgical evaluation, 71% of patients presented with a painless mass. When symptomatic, pain was the most common complaint (25%), whereas only 3% reported discharge and 1% color change. Only 4% reported bilateral disease. Family history of cancer was reported in 17%. The most common location for a palpable mass was in the upper outer quadrant (20%). Preoperative breast ultrasound was obtained in 70% of patients, with an average mass size measuring 3.5 ± 1.9 cm. A preoperative fine needle aspiration (FNA) biopsy was obtained in 5% of patients. Pathology report for breast biopsy was 78% fibroadenoma, 11% phyllodes tumor, and 11% nondiagnostic.

Patients waited on average 55 ± 89 d after surgical evaluation before definitive excision. All patients ultimately underwent excisional biopsy, with none receiving mastectomy or subsequent breast reconstruction. Twenty-one patients (11%) had more than one lesion surgically removed. There were no reported surgical complications. The average size at pathology was 3.5 ± 1.9 cm. Figure 1 shows the distribution of lesions at final pathology, including fibroadenoma (81.5%), tubular adenoma (5%) benign phyllodes tumor (3%), benign fibroepithelial neoplasm (0.5%), and other benign lesions (10%). There were no malignant lesions in our cohort. The only phyllodes tumor diagnosed by FNA was ultimately found to be fibroadenoma on surgical pathology; whereas one of the FNA-diagnosed fibroadenoma was interpreted as phyllodes tumor on surgical pathology.

Ultrasound size had a Pearson correlation (r) of 0.84 with pathologic size ($P < 0.0001$), shown in Figure 2. Neither BMI ($r = 0.06$) nor age ($r = -0.05$) were associated with pathologic size ($P = 0.45$ and 0.48 , respectively). The distribution of size at pathology is shown in Table 2. Fibroadenoma and phyllodes tumor were both larger in size (4.2 and 3.9 cm, respectively),

Table 1 – Demographic and clinical characteristics of pediatric patients who underwent breast mass excision.

Demographic and clinical characteristics	$n = 196$
Mean age at surgery, years (standard deviation [sd])	15 (3)
Female gender, n (%)	189 (96%)
Mean days from diagnosis to surgery (sd)	55 (90)
Mean BMI, kg/m ² (sd)	22.4 (4)
Family history of breast cancer, n (%)	33 (17%)
Race/ethnicity	
White	20 (10%)
Hispanic	84 (43%)
African American	83 (42%)
Other	9 (5%)

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