



Discrete Breast Masses in Female Children and Adolescents: Is there a Place for Non-operative Management by Pediatric Surgeons?

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Authors' contributions

This work was carried out in collaboration between all authors. Authors AOA and AOL were responsible for the concept and design, data collection and analyses and write up of the final manuscript. Authors AOA and AOL are joint first authors. Authors CCA and COB were responsible for the study design and intellectual content of the manuscript. All authors approved the final version of the manuscript submitted.

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ABSTRACT

Background: The treatment of breast masses in female children and adolescents is controversial. While some advocate for early surgical removal others prefer the conservative non operative approach. The aim of this study is ascertain the evidence for the current protocol of early surgical removal in our centre.

Materials and Methods: Retrospective observational study to highlight the epidemiology of discrete breast masses in female children and adolescents <18years seen at the Lagos University Teaching Hospital, Nigeria. Main outcome measure was to find out if there is a malignancy in

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excised tissue specimens.

Results: Fifty three girls with 76 breast masses were evaluated. Median age at presentation was 16years (4 –17 years). Mean size of lumps was 3.6 cm (± 2.1). All the breast masses had benign clinical characteristics and were confirmed histologically to be benign. There was no case of primary or secondary malignancy in any of the histological specimens. Family history, nipple discharge or ingestion of oral contraceptives did not affect presentation, diagnosis and outcome ($p > 0.05$).

Conclusion: This series show that breast masses in children and adolescents are almost always benign. It is advocated that conservative non-operative management (with close follow up with imaging such as breast ultrasound and/or MRI) should be adopted by paediatric surgeons in cases of breast masses in children except when surgery is specifically indicated. These indications which should be individualized include: cosmesis, bloody nipple discharge, persistent history of pain in the mass, rapid growth of the mass and malignancies with predilection for the breasts.

Keywords: Benign breast masses; children; adolescents; non-operative treatment protocol.

1. INTRODUCTION

Breast masses in children are uncommon, rising steadily with age during the adolescent period to young adulthood [1]. Simpson [2] reported 9 cases of breast tumours over a 40 year period more than 4 decades ago while a more recent study puts the prevalence at 3.25% [3]. The presence of a swelling in the breast is a source of anxiety to patient (older children and adolescents), parents and surgeons. Early removal is widely practiced as the treatment protocol and this is a relief to all concerned [4,5]. In addition, available evidence seems to suggest that some benign breast disease (with atypical cells) could be a risk factor for breast cancer in adults [6,7] which provides a rationale for this treatment approach.

On the other hand, some investigators found that a positive history of prior breast biopsy is associated with a slightly increased risk of breast cancer [8] although no direct causal relationship was established. Furthermore, surgical operations in childhood may impair the development of the pre-pubertal breast [9].

Very little information is available on the treatment approach to management of breast masses in African children by Paediatric Surgeons. The aim of this study is to determine if it was necessary to remove all discrete breast masses in children and adolescents.

2. MATERIALS AND METHODS

This is a retrospective descriptive study carried out at the Department of Surgery, Lagos University Teaching Hospital, Nigeria. All patients below the age of 18 who presented with a discrete breast mass to our hospital over a 4

year period were included into the study. Breast swellings from abscesses and diffuse virginal hypertrophy were excluded. Paediatric Surgery practice in Nigeria caters for children of 15 years and below; however, socially, 18 years is the accepted age of adulthood. We thus decided to study all children below the age of 18 years. The data of those above the age of 15 years were collated through the adult General Surgery unit.

Data including the age, clinical characteristics of the mass, the method of diagnosis, the histopathological diagnosis and morbidity from surgery were collated from case notes, charts, and histopathology reports from the Department of Morbid Anatomy. Ultrasonic examination of the breast was not assessed as this is not in the management protocol of our hospital during the period of this study. Analysis was done using Statistical Package for Social Sciences (SPSS®) version 16. Chi square tests were used to determine significant difference of categorical variables. A p value of < 0.05 was considered significant.

The main outcome measure was if there was any patient with histological diagnosis of a primary or secondary malignant disease which is the commonest reason for surgical excision of the mass. Secondary outcome measure was if family history of breast cancer influences the characteristics of the masses in children.

3. RESULTS

3.1 Clinical Characteristics of the Patients and Breast Mass

There were 53 girls who presented with 76 breast masses (Table 1). Thirty eight patients

had a single unilateral breast mass. Of the 12 patients with 2 lumps, 9 were in both breasts while 3 had both lumps in the same breast. Among the remaining three patients, one had 3, another 4 and another 7 breast masses. Forty two (55%) of the breast masses were on the right while 34 (45%) were on the left. The median age of presentation was 16 years (4–17 years) (Fig. 1).

Table 1. Number of lumps per patient

No of lumps	No of patients	Total no of lumps
7 lumps (bil)	1	7
4 lumps (bil)	1	4
3 lumps (bil)	1	3
2 lumps (bil)	9	18
2 lumps (unil)	3	6
1 lump (unil)	38	38
Total	53	76

Key: unil – unilateral breast lump; bil: bilateral breast lumps

The median duration of the breast lump before presentation is 8 weeks (1 – 156 weeks), Fig. 2. The location of the breast mass is as shown in Fig. 3; the commonest location being the upper outer quadrant in about half of the patients. The mean size of the lumps is 3.6 cm (± 2.1 cm). All the breast masses were freely mobile and none was attached to overlying skin or underlying muscle. Six patients (11.3%) complained of associated pain in the breasts; median duration

of pain was 2 weeks (range 1 – 8 weeks). There was positive family history in 2 patients (3.8%). The presence of family history did not affect the presentation in terms of duration of symptoms, size of mass, presence of pain, nipple discharge, histological diagnosis, axillary swellings and final outcome when compared to the other patients ($p > 0.05$). Two patients had a history of nipple discharge; one had a right nipple discharge while the second had a bilateral nipple discharge. Both have had it for 2 years before presentation. None of the two patients had weight loss, axillary lymph node enlargement or history of ingestion of oral contraceptive pills. Only one patient had a positive history of ingestion of oral contraceptive pills.

The circumareolar incision was the most used incision in 39 patients (73.6%) while curvilinear incision was used in 4 (7.5%) patients. The incision was not specified in 10 (18.9%) patients.

3.2 Diagnosis

Diagnosis was based on clinical evaluation and histological confirmation of the specimen. The clinical diagnosis was suspected fibroadenoma in 52 patients (98.1%) and fibroadenosis in one patient (1.9%). Fibroadenoma was confirmed in 46 (86.8%) patients histopathologically. A patient each had fibrocystic disease, fibroma and fibroadipose tissue. Records of 3 patients could not be verified. None of the patients had Ultrasonographic evaluation of the breast.

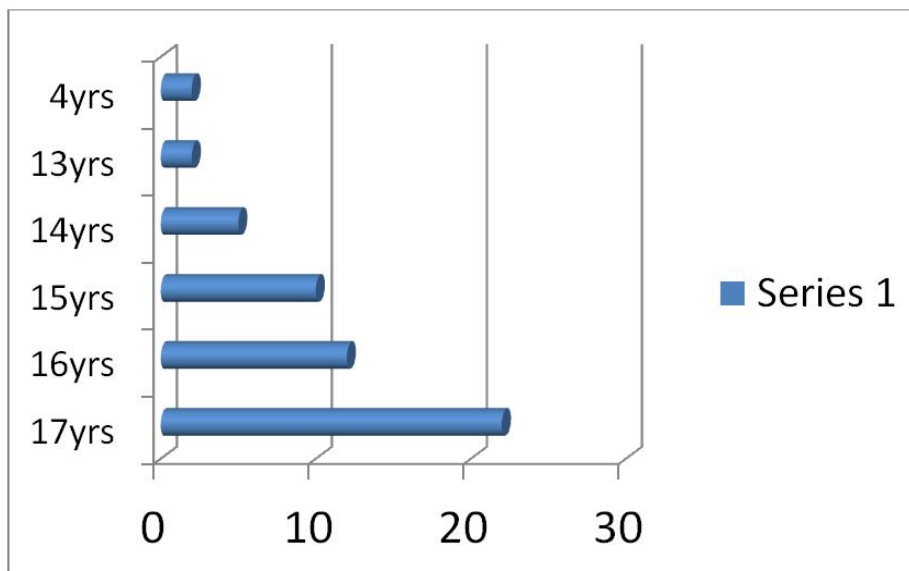


Fig. 1. Age distribution of patients with breast lump

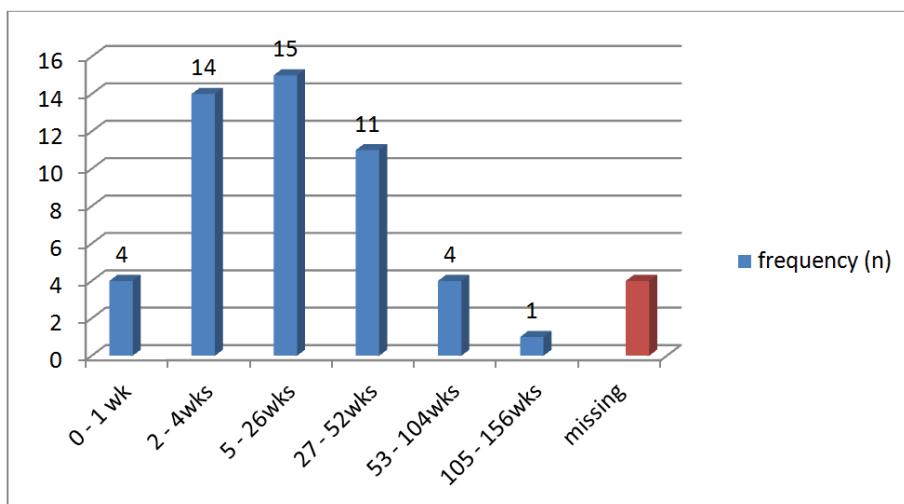


Fig. 2. Distribution of patients according to the duration of symptoms before presentation to hospital

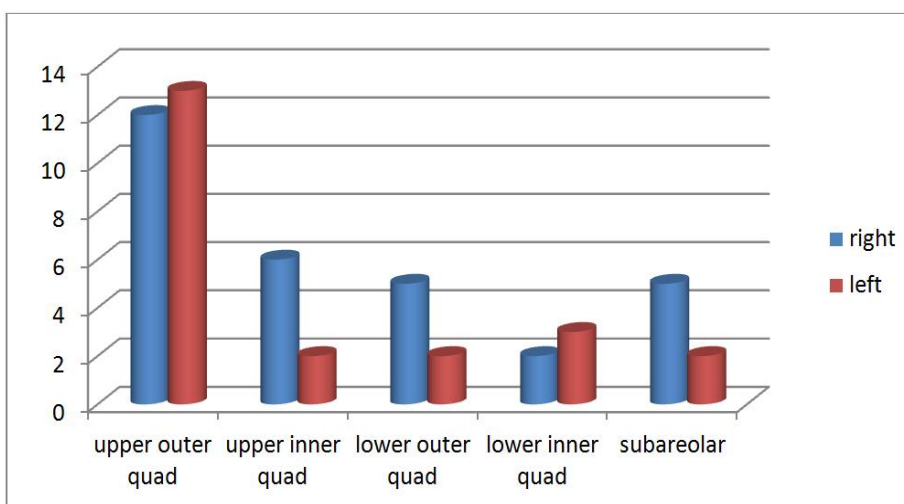


Fig. 3. No of patients with the location of their breast lumps

The method of sampling for pathological diagnosis was Fine Needle Aspiration Cytology (FNAC) in 42 patients prior to excisional biopsy while excisional biopsy method was employed in 4 patients without FNAC. Records of 7 patients were not available. There was no case of primary or secondary malignancy in the histological specimens of the patients.

3.3 Treatment and Outcome

Patients seen by the Paediatric Surgeons were operated under general anaesthesia while those seen by the General Surgeons were performed under local anaesthesia and sometimes with sedation in the younger teenagers using

intravenous diazepam and pentazocine. Excisional biopsy was done in all cases. The surgeries were performed as Day Case surgeries. The wounds healed with satisfactory scar. There was one case (1.9%) of surgical site infection and one case (1.9%) of recurrence. In children treated by Paediatric Surgeons, excisional biopsy was performed for the 2 patients who were 4 years old while the others had Fine Needle Aspiration Biopsy for Cytology (FNAC).

3.4 DISCUSSION

Breast masses are rare in children [2,3]. When they occur, it is usually among adolescent girls

while gynaecomastia is the most common presentation in male children [4,10]. Although it can occur in younger age groups as in this series, the usual age of presentation is in the late teenage years [1,11]. This is the age of sexual awareness and this group of patients are able to notice changes in their bodies early, although they many not report it early. In this study, about 25% girls presented to the hospital within a month of noticing a mass in their breasts while 62% had presented by 6 months of noticing the mass. This is lower than the experience of Ziegler et al [5] where 19/24 (79%) patients had presented within 3 month of noticing the mass. The reason for presenting late in our environment might be linked to our culture that may not make the teenagers to be free about discussing issues about intimate parts of the body.

The commonest site of the breast lump is the upper outer quadrant as in previous reports [5]. The reason for this has been said to be the larger percentage of breast tissue in this quadrant that dovetails towards the axillae. The upper outer quadrants account for 47% of the location of the breast lumps in this study. This confirms earlier observations by Ziegler et al. in which 53% of the benign breast masses of Israeli adolescent females were in the upper outer quadrants of both breasts [5].

All the breast masses in this series showed benign features clinically, they were freely mobile and palpable, slow growing and not associated with constitutional symptoms or weight loss. Almost all the breast masses in children and adolescents are benign. Although few reports of malignant breast masses in children have been reported [12], majority of them are secondary metastasis or primary secretory ductal carcinoma and altogether, they constitute less than 0.2% of all cancers in children [10,13]. Malignant transformation of a fibroadenoma is yet to be proven in literature especially among children as cases of lobular or ductal carcinoma found in histological specimens of fibroadenoma are in adults older than 30 years [14,15]. Pain is also not common and in our series, it is only present in 9 patients or 11% compared to 13% from a study in Israel [5] and 13.5% from another study in the US [10]. Two patients had a family history of breast lump. The presence of family history did not affect the presentation or diagnosis and outcome. This may suggest that in this age group, family history may not be an important contributory factor. Only one patient admitted to

the use of oral contraceptive pill among the patients and this did not affect the presentation and diagnosis in her. There is a low patronage of oral contraceptives as barrier method is more prevalent among young women and adolescents in Nigeria [16]. Another report from Nigeria showed that only 6% of secondary school teenagers use oral contraceptives [17].

The protocol in the unit was to perform an excisional biopsy for breast lesions in young children less than 10 years. Although the children are hardly bothered by the masses the mothers are often anxious and usually request removal. Since most of the masses are uniformly benign, additional procedure of FNAC was not deemed necessary. In older girls, however, the adult protocol of doing a FNAC to rule out malignancy before an excisional biopsy was followed. The clinical diagnosis was 91% accurate predicting fibroadenoma in 45/46 patients but missing out the diagnosis of fibroadenocystic disease, fibroma and fibroadipose tissue.

The current protocol of treatment of children with discrete breast masses in our centre is to do a primary excision biopsy in pre- adolescent girls while a diagnostic FNAC followed by an excisional biopsy is performed in older (teenage) girls. The rationale for the latter is that FNAC rules out a malignancy in the presenting breast mass while excision removes the risk of future development of malignancy in a presumed benign lesion. The finding of carcinoma in fibroadenoma samples supports this rationale [14].

This current series did not show any medical benefit for such protocol as there was no single case of malignancy among our patients. In other series in children and adolescents, the findings are similar [5]. Although it can be argued that the current protocol has relieved the anxieties of the parents and sometimes the patients', the risk of a malignant transformation in such lesions is very low and almost non-existent. Most reported cases of occurrence of a carcinoma in a fibroadenoma have been in adults in their 4th or 5th decades [15,16].

There are some controversies that surround the management of breast masses in children. First, pre-existing breast disease is an independent risk for breast carcinoma and so is the diagnostic intervention (biopsy) [7,8]. In addition, both biopsy and surgery has been reported to impair the development of the breast at puberty to full

maturity resulting in unilateral hypoplasia of the breast [9]. Surgery of the developing breast could also affect breastfeeding in future if the lobules are removed during such procedure [18]. Second, while some authors advocate a biopsy for all breast masses and subsequent removal, some others suggest a conservative approach even in young adults [11]. The question is: should Paediatric Surgeons be dragged into such controversy?

Even though breast cancer can occur in children, these reports are very rare and may not form a basis for a practical approach to be adopted by Paediatric Surgeons in the treatment of all patients with breast disease in childhood. There seems to be advantages in conservative management of breast masses in childhood. First, such an approach removes the need for an unnecessary surgery. In this series, one of the masses removed was adipose tissue and this is not peculiar to this study [5]. Secondly, it allows the breast to develop to maturity during puberty. Lastly, it gives room for a possible involution of the mass in those that potentially have this tendency.

Whatever the case may be, this controversy need not involve Paediatric Surgeons who manage patients much younger than 18 years. In Nigeria, Paediatric Surgeons cater for surgical needs of children less than 15 years while at the Red Cross War Memorial Children's Hospital, South Africa, the cut off age is 12 years [19]. This present series (which is fairly large compared with others in literature) confirms that malignancy in breast masses is rare in female children and adolescents as there was none among our patients. Similarly, the family history of breast cancer did not influence the presentation of breast mass in children and may not be useful in to determine if surgical intervention should be employed in their treatment. While a high index of suspicion can be maintained in all cases, it seems rational to follow up the patient to adulthood without any intervention.

The role of Ultrasonography in the diagnosis of breast masses in children was not explored in this study. This is because this diagnostic tool is only being recently employed in our centre. Some authors have documented that the negative predictive value of breast ultrasonography is up to 96% [20]. Hence this may become more relevant during the period of follow up. Indications for surgery as suggested by West et al. [10] and Simmons [18] which we

suggest should be individualized to each patient include: persistent history of pain in the mass, rapid growth of the mass and malignancies with predilection for the breasts. Others are cosmesis (giant mass), recurring cystic mass or bloody nipple discharge. It is important to emphasize that thorough patient(s)' (and parent(s)') counselling is essential during this period of non-operative management.

4. CONCLUSION

In conclusion, this series show that breast masses in children and adolescents are almost always benign. Since surgical intervention may affect full breast development and future breastfeeding, it is advocated that conservative management should be adopted by paediatric surgeons in cases of breast masses in children except when specifically indicated.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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