A Prospective Observational Study of Breast Lumps in Adolescent Girls: Tertiary Care South Indian Teaching Hospital Experience

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Abstract

The aim of the current study was to assess the incidence and varying clinical presentations of benign breast lumps in adolescent age group in a Tertiary care Medical College Hospital. This was a prospective, observational study of 6-year duration (2011 to 2017) conducted in a Medical College, South India. All adolescent age group patients visiting the outpatient department (OPD) with complaints of breast lump were enrolled into the study. Triple assessment comprising of clinical examination, imaging, and core biopsy was used for diagnosis and identification of type of tumor. Management of tumors was based on pathology of core biopsy. During the study duration (2011 to 2017), a total of 15 pediatric patients of age between 11 to 14 years, presented with complaints of breast lumps. The most common symptom included painless lump in breast in 11 patients (73.34%). The histopathological examination (HPE) reported 12 cases (80%) as fibroadenomas and only 3 cases (20%) were phyllodes tumors. Based on the results of HPE, majority of the patients (53.34%) underwent circumareolar cosmetic incision. The most common lesions in pediatric age group are benign fibroadenomas; however, phyllodes are also not rare, and to manage them appropriately, they should be diagnosed preoperatively with core biopsy. Cases of malignancy, including phyllodes tumors, ductal adenocarcinomas, and metastatic lesions, have been documented in children and adolescents. Therefore, malignancy should be considered in the diagnosis of a pediatric and adolescent breast mass until formally ruled out.

Keywords Pediatrics · Fibroadenoma · Phyllodes tumor · Breast lump · Benign tumors · Triple assessment · Core biopsy · Sonomammography

Introduction

Breast development is one of the first obvious signs of puberty and any variation in its normal progression often deserves

Key Messages Standard diagnostic and treatment guidelines for management of breast tumors in pediatrics are lacking. Appropriate diagnosis is very important since management of the breast tumors is entirely based on their type. More studies should be conducted to highlight various safe and effective treatment options practiced worldwide for pediatric breast tumors.

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attention [1]. Breast lumps are rare in pediatric population [2], but presence of any breast mass frequently raises substantial patient and parental concern of a potential cancer. Pediatric breast lumps are usually benign and self-limited, although malignancies have been reported in children [3]. The most prevalent benign breast lesions in adolescents include fibrocystic disease, fibroadenoma (juvenile or giant), breast trauma, and breast infection. Less prevalent benign breast lesions include mammary duct ectasia and cysts of Montgomery. Intraductal papilloma and phyllodes tumor (large painless, rapidly growing, stromal proliferation) also are usually benign, but may be malignant. Malignant breast lesions are extremely uncommon in adolescents, but may include primary breast cancer, metastatic cancer, and secondary cancer [4, 5]. In a review of adolescent studies since 1960, the most common medically diagnosed masses prior to surgery were fibroadenomas (30–50%), followed by fibrocystic change (1.4–13%), benign phyllodes tumor (0–17%), mastitis/abscess (0–7%), proliferative disease (0–7%), with malignancy found in 3.3 to 5.4%. [6]. Pediatric breast disorders can

occur at any age. The chief complaints can include abnormal enlargement, asymmetric growth, nipple discharge, breast pain, skin changes, or a palpable mass [7].

Various studies conducted worldwide, reported that a detailed patient history, focused physical examination, radiological imaging (ultrasonography or mammography) along with a tissue specimen analysis (fine-needle aspiration cytology or core needle biopsy) are used as diagnostic tools for a possible malignant disease at an early stage. Newer studies have indicated that core biopsy distinguishes fibroadenoma from phyllodes due to their heterogeneity in cellularity and thus the patient can be managed in a better way [8, 9]. Management of fibroadenoma may comprise of observation (asymptomatic, not rapidly enlarging, and not causing cosmetic deformity), minimally invasive techniques (vacuum-assisted percutaneous biopsy and ablative procedures), or surgical excision for rapidly growing fibroadenoma [10, 11]. For giant juvenile fibroadenoma, a complete excision is required with an emphasis on preserving the developing breast parenchyma and nipple areolar complex [12]. In contrast, phyllodes tumors should be treated with complete surgical resection [13].

Treatment guidelines for management of breast lumps in pediatric population are lacking and therefore it is often very challenging for the surgeons to treat these patients. Hence, the present study was conducted to gain insights of various benign breast pathologies, their distribution, approach and outcome, and treatment modalities practiced for breast lumps in pediatric age group esp. adolescents.

Subjects and Methods

The study was conducted in a Medical College, a tertiary care teaching hospital in South India. It was a prospective, observational study of 6-year duration conducted between 2011 and 2017. All adolescent age group patients visiting the outpatient department (OPD) of the hospital with complaints of breast lump were enrolled into the study.

Triple assessment (gold standard) comprising of clinical examination along with imaging (sonomammography) and core biopsy was used for diagnosis and identification of type of breast lump.

Clinical Examination The clinical examination of breasts included checking for the normal appearance of breast and nipples (differences in size, shape, or texture) in different postures (raising arms over head, hanging arms on sides, or pressing hands against hips). The skin covering the breasts was checked for any rash, dimpling, or other abnormal signs and the nipples were checked for any fluid discharge when lightly squeezed. The lymph nodes near the breast were also checked for any enlargement.

Fig. 1 Ultrasound breast illustrating fibroadenoma (a) and phylloides (b)

Sonomammography The patient was made to lie down on the examining table. The gel was applied on the breast area and the whole chest and armpits area was scanned using a special probe (linear, high frequency) for any lump or mass.

Fig. 2 Excision of fibroadenoma in young, circumareolar incision (a and b), gross specimen (c)

Fig. 3 Right breast phyllodes tumor excision, lump involving the whole right breast (a) and tumor excised with incision along the inframammary fold (b)

Core Biopsy An ultrasound guided core needle biopsy was carried out on all the patients. A thin, hollow needle 23G was inserted into the breast and several tissue samples (5 to

8 mm) were collected from the breast mass. Histopathological examination of each tissue sample was carried out.

Management of the lumps was based on pathology of core biopsy.

Results

During the study duration (2011 to 2017), a total of 15 adolescent age group patients with age between 11 to 14 years, presented in the OPD with complaints of breast lumps. Among these patients, the age of nine patients (60%) who presented with breast lumps was between 12 to 13 years, and an equal incidence of three patients (20%) in each was reported for ages 11 and 14 years. The most common symptom included painless lump in breast in 11 patients (73.34%), followed by bilateral mastalgia and recurrent lump. The sonomammography of the breast showed that the size of most of the tumors ranged between 5 to 7 cm in about 8 patients (53.33%) and rest of the tumors were either more than 10 cm or less than 5 cm in size. The sonomammography of the breast as shown in Fig. 1, revealed two different appearances of lumps, i.e., as a round lump with defined margins (A) which were later identified as fibroadenomas and as an irregular bosselated lump (B) which were later confirmed as phyllodes tumor. The presentation of breast lumps was mostly unilateral in around 13 patients (87.67%) and only two patients (13.33%) had bilateral breast

Table 1 Patient demographics, symptoms, and tumor characteristics

Clinical features		Total number of patients (<i>n</i> = 15)
Age at the time of presentation	11 years	3 (20%)
	12 years	5 (33.33%)
	13 years	4 (26.67%)
	14 years	3 (20%)
Symptom	Painless lump in breast	11 (73.34%)
	Bilateral mastalgia	2 (13.33%)
	Recurrent lump	2 (13.33%)
Size of tumor	< 5cm	3 (20%)
	5–7 cm	8 (53.33%)
	> 10cm	4 (26.67%)
Side of involvement	Unilateral right side	10 (67.67%)
	Unilateral left side	3 (20%)
	Bilateral	2 (13.33%)
Occurrence	Primary	13 (86.67%)
	After recurrence	2 (13.33%)
Histopathological report	Juvenile Fibroadenoma	4 (27%)
	Fibroadenoma	8 (53%)
	Benign phyllodes	3 (20%)
Surgical approach and cosmetic incision	Circumareolar	8 (53.34%)
	Inframammary	5 (33.33%)
	Axillary fold cosmetic incision	2 (13.33%)

lumps. Majority of the patients (13 cases) had the primary occurrence of the disease and only 2 cases were reported to have disease reoccurrence. The histopathological examination (HPE) of the core biopsy tissue reported 12 cases (80%) as benign fibroadenomas out of which four (27%) were juvenile fibroadenomas and others were simple fibroadenoma, and only three cases (20%) were found to be benign phyllodes tumors. Based on the results of HPE, majority of the patients (53.34%) underwent circumareolar incision (Fig. 2) followed by inframammary incision in around 33.33% patients (Fig. 3).

The details of patient demographics and symptoms along with the tumor characteristics are highlighted in Table 1.

Discussion

As highlighted above, the highest incidence of benign fibroadenoma and phyllodes tumor was reported in the patient with age between 12 to 13 years, as a unilateral painless lump with sizes ranging from 5 to 7 cm. The majority of the cases were reported as benign fibroadenoma of breast and only three were reported as benign phyllodes tumor. Surgical intervention in all the patients was based on the pathology of the core biopsy. For benign fibroadenomas, a simple excision was done and for phyllodes tumors, a wide local excision of

1 cm was done, with tridimensional 1-cm margin and circumferential negative 1-cm margin.

Among the three phyllodes tumor cases, two cases were referred to the OPD of the hospital after recurrence, which were initially diagnosed as fibroadenoma after a fine needle aspiration biopsy (FNAC) and managed by simple excision in lieu for fibroadenoma. Upon re-review of these two cases by core needle biopsy, a heterogeneity in cellularity was noted and they were confirmed as phyllodes tumor and as wide excision was not performed earlier for these, both recurred. Of these two cases, in one case post first surgery, recurrence was noted after 13 months and in other after 20 months. Both the patients underwent appropriate surgical management for phyllodes tumors and they were followed-up. No signs of recurrence have been reported till date in both the patients. One case, among the three phyllodes tumor was diagnosed by pre-operative core biopsy at presentation only and treated adequately.

Hence, pre-operatively a triple assessment with core biopsy is mandatory. Only a simple excision is required for fibroadenomas; whereas, it has to be a wide excision with 1-cm negative tridimensional margin for phyllodes tumor, in view of their very high recurrence rates.

A comparative analysis of results from the studies conducted worldwide with the present study is reported in the chart below:

Comparative analysis Parameters	Study 1 [1]	Study 2 [16]	Study 3 [15]	Study 4 [14]	Present study
Year	2012	2012	2013	2016	2017
Country	India	Nigeria	Turkey	India	India
Age of female patients (years)	12	12–46	10–17	11	11–14
No. of patients (n)	1	22	10	1	15
Type of tumor(s) diagnosed	Giant fibroadenoma	Giant fibroadenoma	3-Phyllodes tumor, 3- tubular adenoma, 4- Fibroadenoma	Phyllode	12-Fibroadenoma, 3-Phyllodes tumor
Surgical management(s)	Total excision of the mass preserving the nipple and areola	Reduction mammoplasty incision or inframammary incision	Circumareolar or para-aerolar incision according to the location of the mass	Excision biopsy using an inframammary incision	Circumareolar incision or inframammary incision (cosmetic incision)

Conclusion

The discovery of a breast mass can be disconcerting and can provoke anxiety and fear for the patient as well as her family. The most common lesions in pediatric age group are benign fibroadenomas; however, phyllodes are also not rare and to manage them appropriately they should be diagnosed pre-operatively with core biopsy, so that a wide excision can be done to prevent their recurrence. The most common presentation of these benign tumors in breast is as a painless lump.

Triple assessment with core biopsy is recommended with sonomammography and clinical examination. Core biopsy is preferred and recommended over FNAC to distinguish fibroadenomas from phyllodes. Physicians need to tailor the care of an adolescent with a breast mass by recognizing the differential risks. When clinical features provoke concern for a higher-risk mass, expertise with this adolescent population is important to optimize outcomes. Unlike simple excision for fibroadenomas, wide excision with negative 1-cm tridimensional margin for phyllodes is required to prevent their

recurrence. In benign lesions, as much as possible, cosmetic incisions and approach like circumareolar or Inframammary, or axillary fold incisions should be done, wherever feasible. Cases of malignancy including phyllodes tumors, ductal adenocarcinomas, and metastatic lesions have been documented in children and adolescents. [4, 5]. Therefore, malignancy should be considered in the diagnosis of a pediatric and adolescent breast mass until formally ruled out [17].

Surgical principles gained from the adult population have been extrapolated for use in children, although these methods have not been validated in the pediatric population. Further research is required to clarify best management, in pediatric age group patients with breast lumps although with limited incidence of cases, large-scale trials are likely not feasible.

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