Original Research Article

Clinical radiological and pathological assessment of benign breast lumps: our institutional experience

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ABSTRACT

Background: With increased awareness about breast cancer, many women with breast lumps are attending clinics. Though benign breast lumps are most common, they may be associated with morbidity and have become cause for concern to patients. Triple assessment by clinical, radiological and pathological examination is a standard approach in the evaluation of breast lumps. Even in cases of benign breast diseases, multimodality tests are being preferred to give reassurance to patients. This study was aimed to study distribution of various benign breast lumps in relation to age at presentation, to identify sensitivity and specificity of clinical breast examination, Ultrasonography (USG) and Fine needle aspiration cytology (FNAC) methods in the evaluation of benign breast lumps and to compare with final histopathological diagnosis.
Methods: A retrospective study was conducted in department of general surgery at Malla Reddy institute of medical sciences, Hyderabad from August 2013 to July 2017. 202 females with benign breast lumps were evaluated by clinical breast examination, ultrasonography (USG) and Fine needle aspiration cytology (FNAC) methods. All patients underwent excision biopsy of lump. Final histopathological report was taken as reference standard.
Results: Fibroadenoma was most common in 2nd decade. Clinical breast examination and USG showed good sensitivity but less specificity than FNAC. FNAC showed both good sensitivity and specificity. There was very good degree of agreement between FNAC and histopathological diagnosis (Kappa=0.911).
Conclusions: Good clinical examination can give accurate preoperative diagnosis of benign breast lumps. Triple assessment by clinical breast examination, USG and FNAC can be useful in the evaluation of benign breast lumps.

Keywords: Benign breast diseases, FNAC, HPE, Triple assessment, Ultrasonography

INTRODUCTION

Majority of breast disorders are benign.[1-4] Certain benign proliferative disorders of breast can have a risk of progression to malignancy.[2,5-7] Hence, thorough evaluation of breast lumps is essential. Clinical examination is the first step in the assessment of breast disorders.[2,3] With the advent of imaging modalities, ultrasonography or ultrasound (USG) of breast has become an important diagnostic tool.[2,8] Triple assessment

by clinical examination, imaging like mammography, pathological assessment by core or open biopsy has been a standard approach in the evaluation of breast lumps.[1-3] Ultrasonography of breast is relatively less expensive imaging modality available in many centers and has no roentgenographic exposure.[8] USG also gives information about tumour size, extent and number. Ultrasound (USG) can be useful in differentiating solid from cystic lesions of breast as certain complex cysts may harbour malignancy and thus indicate the need for further

evaluation and follow up.[9-11] USG was particularly useful in young women with dense breasts.[1] Fine needle aspiration cytology (FNAC) is an important first method of pathological assessment of breast disorders.[1,12,13] Open or core needle biopsy techniques are relatively more costly and traumatic.[13] FNAC has been shown to be safe, rapid, reliable and cost-effective technique for diagnosis of breast lesions.[1,12,13]

Hence, USG and FNAC are preferred as initial methods of assessment and considered to be included in triple assessment of breast lumps in few studies.[14] Histopathological examination (HPE) of excised specimen of breast lump is used for final confirmation of diagnosis.[3,14] The aim of this study is to study distribution of various benign breast lumps in relation to age at presentation, to identify sensitivity and specificity of clinical breast examination, Ultrasonography (USG) and Fine needle aspiration cytology (FNAC) methods in the evaluation of benign breast lumps and to compare with final histopathological diagnosis.

METHODS

This is a retrospective, record based, study conducted in general surgery department at Malla Reddy institute of medical sciences from August 2013 to July 2017. 202 cases of benign breast lumps were studied in relation to age group, clinical, radiological and pathological assessment and their comparison with final histopathological diagnosis. 202 female patients with benign breast lumps were evaluated by clinical breast examination, ultrasonography (USG) and Fine needle aspiration cytology (FNAC) methods. All patients underwent excision biopsy of lump. Final histopathological report was taken as reference standard.

Records of all, 202 cases, diagnosed with one of the benign breast lumps, and underwent excision biopsy for final histopathological confirmation of diagnosis, with mention of detailed clinical notes and mention of clinical diagnosis and reports of FNAC and USG were included in study. Records of all these patients were studied for relation to age group, clinical, radiological and pathological assessment and their comparison with final histopathological diagnosis. Male patients, malignant breast diseases, cases with history of previous surgery for breast lump or malignancy, history of chemotherapy, breast abscess, inconclusive or inadequate smears on FNAC, incomplete records without FNAC or USG reports were excluded from study. All the records, found suitable for inclusion during study period were included in study. Detailed recorded history of patients with palpable breast lumps like age of patient, mode of onset of breast lump, duration, progress, pain, nipple discharge, fever, history of trauma, history of lactation, relevant past, personal, menstrual, obstetric history were noted. Clinical examination findings based on which diagnosis was done like site, size, shape, surface, margins, mobility, skin over lump, nipple discharge, retraction of nipple, axillary lymph node enlargement were noted.

All these patients were subjected to ultrasound examination of both breasts including axillae. USG findings and the diagnosis made was recorded. USG was done by experienced radiologist. These patients were also subjected to FNAC of breast lump. FNAC was done by experienced pathologist in a standard technique. All these patients who required surgery were subjected to necessary investigations. Informed consent for surgery was taken. Surgery was done and the excised specimen was sent for histopathological examination for final confirmation of diagnosis.

RESULTS

In this study, out of 202 benign breast diseases, fibroadenoma was found to be the most common presentation (75%). Fibroadenoma was found to be most common in 21-30 years age group. Fibrocystic disease was found to be more common in 31-40 years. Phyllodes tumour was found in 31-40 years, duct papilloma in 3rd and 4th decades, duct ectasia in 41-50 years, galactocele was found most common in 21-30 years age group (Figure 1). Diagnosis by each modality was then compared with diagnosis by final histopathological examination.

Table 1: Diagnosis by clinical breast examination versus HPE.

Benign breast lumps	Clinical	HPE						Total
		Fibroadenoma	Phyllodes tumour	Fibrocystic disease	Galactocele	Duct papilloma	Duct ectasia	
Fibroadenoma	167	147	3	14	1	2	0	167
Phyllodes tumour	6	1	5	0	0	0	0	6
Fibrocystic disease	21	4	1	13	0	1	2	21
Galactocele	3	0	0	1	2	0	0	3
Duct papilloma	2	0	0	1	0	1	0	2
Duct ectasia	3	0	0	1	0	0	2	3
Total	202	152	9	30	3	4	4	202

The sensitivity, specificity, positive and negative predictive values of clinical breast examination for the diagnosis of benign breast lumps were 98.8%, 65.9%, 91.9% and 93.1% respectively (Table 1).

USG showed 98.3% sensitivity while specificity, positive and negative predictive values were 71.4%, 93.1% and 91.5% respectively (Table 2). Sensitivity and specificity of FNAC were 97.2% and 96.4% respectively while

positive and negative predictive values were 99.1%, and 89.8% respectively (Table 3).

Degree of agreement between each diagnostic modality and HPE were analyzed. Clinical diagnosis was found to be in good agreement with HPE with a kappa value of 0.725. USG was also found to be in good agreement with HPE (kappa 0.76). FNAC was found to be in very good agreement with HPE (kappa 0.911).
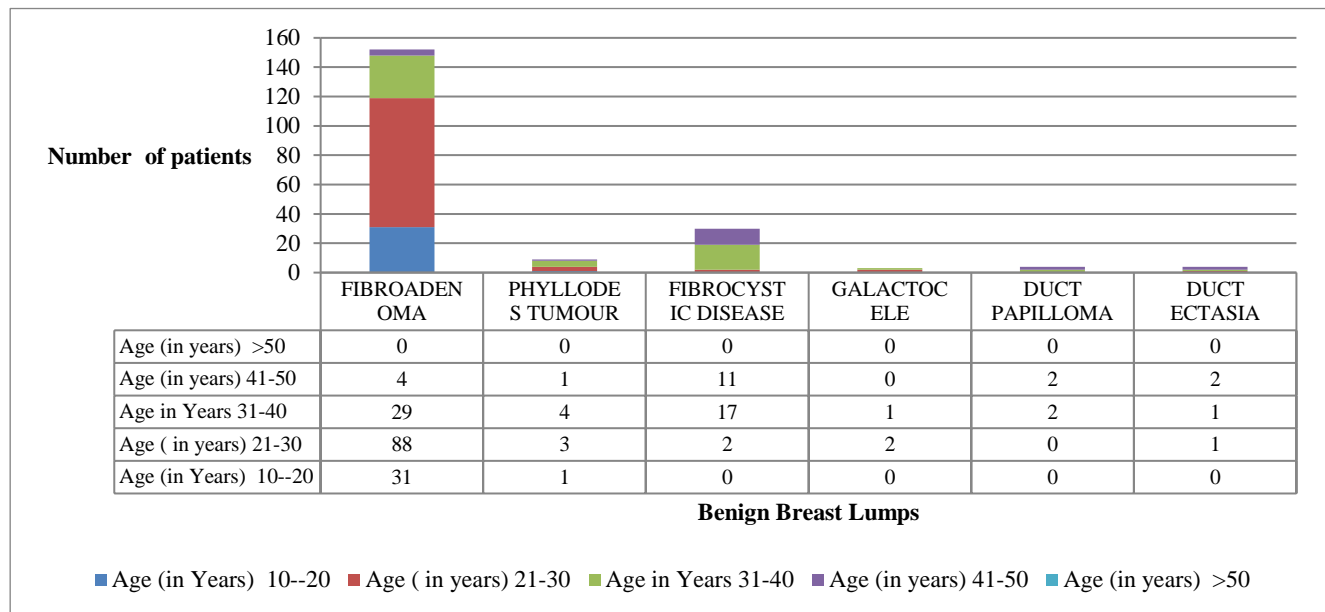

	FIBROADEN OMA	PHYLLODE S TUMOUR	FIBROCYST IC DISEASE	GALACTOC ELE	DUCT PAPILLOMA	DUCT ECTASIA
Age (in years) >50	0	0	0	0	0	0
Age (in years) 41-50	4	1	11	0	2	2
Age in Years 31-40	29	4	17	1	2	1
Age (in years) 21-30	88	3	2	2	0	1
Age (in Years) 10--20	31	1	0	0	0	0

Benign Breast Lumps

■ Age (in Years) 10--20   ■ Age (in years) 21-30   ■ Age in Years 31-40   ■ Age (in years) 41-50   ■ Age (in years) >50

Figure 1: Distribution of benign breast lumps according to age groups.

Table 2: Diagnosis by ultrasonography (USG) versus HPE.

Benign breast lumps	USG	HPE						Total
		Fibroadenoma	Phyllodes tumour	Fibrocystic disease	Galactocele	Duct papilloma	Duct ectasia	
Fibroadenoma	163	145	3	12	1	2	0	163
Phyllodes tumour	7	1	6	0	0	0	0	7
Fibrocystic disease	25	6	0	17	0	0	2	25
Galactocele	2	0	0	0	2	0	0	2
Duct papilloma	3	0	0	1	0	2	0	3
Duct ectasia	2	0	0	0	0	0	2	2
Total	202	152	9	30	3	4	4	202

Table 3: Diagnosis by FNAC versus HPE.

Benign breast lumps	FNAC	HPE						Total
		Fibroadenoma	Phyllodes tumour	Fibrocystic disease	Galactocele	Duct papilloma	Duct ectasia	
Fibro adenoma	152	145	3	3	0	1	0	152
Phyllodes tumour	6	1	5	0	0	0	0	6
Fibrocystic disease	38	6	1	27	1	1	2	38
Galactocele	2	0	0	0	2	0	0	2
Duct papilloma	2	0	0	0	0	2	0	2
Duct ectasia	2	0	0	0	0	0	2	2
Total	202	152	9	30	3	4	4	202

DISCUSSION

In this study, all the patients presenting with palpable breast lumps were evaluated by clinical breast examination, ultrasonography and FNAC. The results of each method were compared with final HPE report. In this study, fibroadenoma was the most common breast lump. Similar finding was found in studies done by Khanna et al, Sangma et al.[15,16]

Fibrocystic disease was the next most common type in this study. Even in study done by Chandanwale et al, fibroadenoma was the most common and fibrocystic disease was the second most common benign breast disease.[17] Fibroadenoma was found to be most common in 21-30 years and fibrocystic disease was most common in 31-40 years age group in this study. In studies done by Khanna et al, Sangma et al, similar observation was found. The incidence of fibrocystic disease in other studies ranged from 29.5-42.2% .[18]

Phyllodes tumour was found common in 31-40 years, galactocele in 21-30 years, duct papilloma in 3rd and 4th decades, duct ectasia in 41-50 years age group in this study. In study done by Chandanwale et al, cases diagnosed on FNAC as fibroadenoma were found to be more common in 21-30 years age group, fibrocystic disease in 31-40 years followed by 21-30 years, galactocele in 21-30 years, benign phyllodes tumour in 31-40 years followed by 41-50 years, duct ectasia in 41-50 years age group.[18]

In this study the diagnosis of breast lump by each modality like clinical examination, USG and FNAC was compared with final HPE. The results of the present study were compared with other studies. Studies which compared all the three modalities with final HPE or which employed individual modality and compared with final HPE were analysed.

Clinical breast examination showed good sensitivity of 98.8% in the diagnosis of benign breast lumps in this study. Out of 167 cases clinically diagnosed as fibroadenoma,147 cases were histologically proved the same. The degree of agreement between clinical breast examination and HPE was good (kappa= 0.725). In study done by Cant et al, out of the cases clinically diagnosed as fibroadenoma, histological confirmation was found in 68%.[19] In study done by Carty et al, of the breast disorders thought to be fibroadenomas preoperatively by clinical breast examination, imaging and cytology, histology differed in only 4 (75%) out of 53 fibroadenomas.[20] In their study, sensitivity of cytology and sonomammography for diagnosis of fibroadenoma were 84% and 98% respectively with a positive predictive value of 92.5%.

In another study done by Eltahir et al, clinical diagnosis showed 88.7% sensitivity, 99.1% specificity and 98.5% positive predictive value.[21] In a study conducted by

Egwuonwu et al, histology differed in 7 out of 49 fibroadenomas diagnosed by clinical examination and none was malignant. The sensitivity, specificity, positive predictive values were 93.3%, 58.8%, 85.7% respectively.[22] In the present study, sensitivity and specificity of USG in the diagnosis of benign breast lumps were 98.3% and 71.4% respectively.

The sensitivity of ultrasound in diagnosing fibroadenoma was 75% in study done by Gonzanga et al and 81.8% in study done by Mansoor et al.[23,24] In a study done by Kailash et al, sensitivity, specificity and positive predictive values of ultrasound in fibroadenoma of breast were 81.6%, 94.7% and 91.2% respectively.[25] In this study, FNAC showed 97.2% sensitivity and 96.4% specificity in the diagnosis of benign breast lumps.

In study done by Cant et al, sensitivity and specificity of FNAC for fibroadenoma were 87% and 76% respectively.[19] In a study done by Bukhari et al, out of 70 fibroadenomas diagnosed on FNAC, there were 60 on histopathology and the remaining were of different diagnosis. Out of 90 cases diagnosed as fibrocystic disease, there were 70 fibrocystic disease on histopathology while other cases were of different diagnoses. Out of 5 benign phyllodes tumours diagnosed on FNAC, 3 were found to be benign phyllodes on HPE. No malignancy was seen.[26] Study done by Khaturi et al mentioned that out of cytologically diagnosed 106 benign cases, histologically 105 cases were proved so. There was false negative diagnosis in one case. FNAC of breast lump was found to be associated with increased diagnostic yields.[27]

In a study done by Velu et al, out of 39 cases of fibroadenoma, 37 were proved so on histopathology. Out of 10 cases of fibrocystic disease diagnosed on FNAC, 8 were fibrocystic disease on HPE and one case of phyllodes tumour was diagnosed the same on histopathology.[28] In this study, the sensitivity of clinical breast examination and USG in the diagnosis of benign breast lumps was quite good but showed relatively less specificity than FNAC. FNAC showed sensitivity of 97.2% and good specificity. FNAC done in this study was blind without any imaging guidance.

Usually in cases where blind FNAC gives inconclusive results and for better accuracy, FNAC is preferred to be done under USG guidance.[29] In literature, sensitivity of FNAC varied from 65 to 99%, specificity 96-100% with a predictive value of approximately 99% and inadequate or false negative reports that have an impact on sensitivity varied from 0 to 35%.Inadequate smear and false negativity may be related to position of needle within the lesion, inhomogeneity of lesion and experience of pathologist.[1,29]

Hence, ultrasound combined with FNAC showed excellent improved results in the diagnosis of breast lesions in a study done by Pagani et al.[29] FNAC when

combined with clinical and imaging findings showed sensitivity up to 97%, specificity, positive and negative predictive values of 94%, 79%, 98% respectively.[30,31] Clinical diagnosis and USG were found to be in good agreement with HPE. However, decision of further management of breast lumps could not be probably done based on these modalities alone.

FNAC was found to be in very good agreement with HPE. Thus, this finding goes in favour of statement mentioned in a study that in case of benign breast lumps like fibroadenoma which are rare to become malignant in early age, follow up can be suggested for patients not willing for excision biopsy so as to find out changes in the lump insisting on FNAC to determine histology for future reference.[22]

Even in other studies it was stated that FNAC features were found more informative when combined with physical and radiological findings.[17] Single modality test was not found accurate enough to make the correct diagnosis and that the diagnostic accuracy could be increased by employing multimodality test.[14]

Triple assessment by clinical examination, imaging and pathological examination was suggested in patients with benign breast diseases for immediate reassurance.[16] Therefore to improve diagnostic accuracy, close collaboration amongst clinicians, radiologists and pathologists was found useful.[29,31] But this is a single centre, record based study. Further large scale studies would be useful to study the accuracy and need for triple assessment of benign breast lumps.

CONCLUSION

Thorough clinical examination could be as accurate as other modalities in the diagnosis of benign breast lumps. FNAC under imaging guidance could be much more informative. Cases like fibroadenoma in early age may be assured for follow up based on diagnosis by FNAC alone. Though majority of breast lumps are benign and mostly found in reproductive age group, confirmation of diagnosis is essential. Hence clinical, radiological and pathological assessment by clinical breast examination, Ultrasonography and Fine needle aspiration cytology methods can be useful and effective approach in the evaluation of benign breast lumps.

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