Original Article

Utility of Breast Imaging in Mastalgia

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ABSTRACT

OBJECTIVE: To determine the use of breast imaging in patients with localised or diffuse pain in the breast, in the absence of palpable lump or nipple discharge.

DESIGN: Descriptive study

SETTING: This study was conducted at Radiology Department of Civil Hospital and Dow University of Health Sciences Karachi from October 2007 to September 2008.

PATIENTS AND METHODS: Patients referred for radiological examination of breast(s) in which either mammography or ultrasound or both done were included. Inclusion criteria was pain in the breast present in women between the ages of 15-65 years. Exclusion criteria included palpable lump, and nipple discharge, patients with a history of breast cancer, or breast augmentation. Mammography was done in those who were above 35 years whereas the ultrasound was carried out in every patient with mastalgia. Main outcome measure was presence of the abnormal radiological findings. Findings were categorized in BIRADS terms. Statistical analysis was done for descriptive statistics. Mean±SD of age, numbers and percentage calculation for normal and abnormal findings were carried out.

RESULTS: Among the 175 subjects, pain was unilateral in 136 (77.5%) and bilateral in 39 (22.8%) patients. The mean age was 40±5 years (range 15-65 years). Ninty-five (54.2%) women belonged to premenopausal or perimenopausal age group. The imaging findings were normal/negative in 114 (65.1%), benign in 43 (24.5%), probably benign in 12 (6.8%), suspicious in 04 (2.2%), and malignant in 02 (1.1%).

CONCLUSIONS: No abnormality was found in the painful area in majority of patients. A marked number of patients with benign or probably benign had pain in breast while probable or definite malignant disease was uncommon. Breast imaging in women who present with pain alone provides reassurance.

KEY WORDS: BIRADS, Breast Pain, Mammography, Mastalgia, Ultrasonography.

INTRODUCTION

Breast pain, synonymous with mastalgia or mastodynia, is a very common condition in female.[1] Belieu found that 69% of healthy women self reporting to breast clinics complaints of breast pain so severe as to hinder the daily chore.[2] Pain most frequently causes marked anxiety and women seek medical care.[3] Studies have demonstrated an association between mastalgia, particularly treatment-resistant mastalgia, and psychological symptoms such as depression, anxiety, and somatization.[4-5]

Clinically there are two types of breast pain: cyclical that waxes and wanes with the menstrual cycle and appears to be hormonal dependent in origin, and the other is a noncyclic pain.[6] The underlying physiology may be different for noncyclic and cyclic breast pain.[7] Gum et al, describe that breast pain is of three types, cyclical, noncyclical and some extra-mammary pain usually associated with inflammation of the chest wall.[8]

Cyclical mastalgia is commonest in premenopausal women, whereas noncyclic mastalgia is commonest in postmenopausal women,[9] It is usually unilateral, described as sharp or burning, and more localized in the breast. Diffused breast pain (unilateral or bilateral) is often treated on clinical grounds because of the extremely low likelihood that diffuse breast pain (without additional signs or symptoms) is a sign of cancer. However, focal breast pain even without additional signs or symptoms is usually evaluated to exclude underlying breast disease. It is so because it may occasionally be associated with organic breast lesions.[10] Breast pain is a frequent symptom for which women seek medical attention[11] and causes significant patient anxiety. In women presenting with breast pain, the reported prevalence of breast cancer ranges from 0-3.2%.[12-13] Breast imaging is valuable in the investigation of symptomatic breast disease. Presently breast lesion is evaluated by triple assessment that includes physical examination, mammography and biopsy.[14,15] Mammography is the method of choice for screening women over 50 years of age who have no symptoms and those with a family history of breast cancer.[16-18] In addition, clinicians often refer patients with a painful breast but no palpable lesion for further evaluation.[19] While it is well established that palpable findings warrant diagnostic imaging to exclude malignancy, [20-23] the value of breast imaging

in the other case is not well defined. The frequency of radiological abnormalities and their clinical importance as described by BIRADS terms also helps. For this reason, a prospective observational study was performed to assess the outcome of breast imaging in patients referred for mammography because of painful breast. The object of this study was to determine the use of breast imaging in patients with localized or diffuse pain in the breast, which has apparently no abnormalities on physical examination such as palpable lump and nipple discharge.

***Breast Imaging and Reporting Data System (BI RADS) Categories**:*

0. Assessment incomplete, Need additional imaging evaluation / review prior studies for comparison.
1. Negative/normal continue routine screening
2. Benign finding continue routine screening
3. Probably benign finding (<2% malignant) initial short interval follow up suggested.
4. Suspicious abnormality (2 – 95% malignant) biopsy should be considered
5. Highly suspicious of malignancy (>95%) appropriate action should be taken, (Biopsy and treatment, as necessary).
6. Known biopsy-proven malignancy, treatment pending assure that treatment is completed

PATIENTS AND METHODS

This study included women with painful breast(s) as the sole presenting symptom, referred by general practitioners or hospital specialists to the Radiology Department of Civil Hospital and Dow University of Health Scinces Karachi from October 2007 to September 2008. Any patients who had a palpable lesion in the painful breast was excluded, as were patients with history of breast cancer or breast augmentation. Patients more than 65 years old and those with family history of breast cancer were also excluded as these are well established risk factors for breast cancer. Those categorized as BIRADS 0, requiring imaging additional to mammography and ultrasound were also excluded.

Breast imaging was defined as either mammography, ultrasonography or both. Mammography was performed in conjunction with sonographic examination in those aged 35 years or above, consisted of a two view mammography (craniocaudal and mediolateral oblique views) and additional local compression or magnification mammograms where necessary. Grayscale and doppler ultrasonography was performed using 11 MHZ probe on Toshiba Numio17 subsequently to evaluate any non-conclusive mammographic findings and localised breast pain when a dense looking mammogram format negative. Ultrasonography only was performed in patients aged less than 35 years. The radiologist asked the patient to pin point-out the painful area to ensure that the painful area was included in the standard views. The radiologist also physically examined the breast after reviewing the clinical information, before mammography procedure.

The radiological appearances were classified on the basis of Breast Imaging, Reporting and Data system (BIRADS). Those labelled as BIRADS 3 were followed up at 06 monthly interval atleast once as recommended. Data were entered in MS Excel and descriptive statistics for age and frequency of finding and symptoms were calculated along with measures of central tendency.

RESULTS

During the study pain as the solitary symptom in breast was the reason for imaging in 175 cases out of the total 614 cases refered for breast imaging. It was unilateral in 136 (77.5%) and bilateral in 39 (22.8%) patients. The mean age was 40±5 years (range 15-65 years) shown at **Table I**. Ninty-five (54.2%) women were premenopausal or perimenopausal age group and had no family history of breast cancer and not taking exogenous hormones.

The imaging findings were normal/negative in 114 (65.1%), benign in 43 (24.5%), probably benign in 12 (6.8%), suspicious in 04 (2.2%), and malignant in 02 (1.1%) as depicted in **Table II**. The benign findings included were cysts in 16 (37.2%), fibroadenoma in 12 (28%), mastitis in 09 (20%) and duct ectasia in 06 (14%) cases. U/S features of these benign and malignant masses are described in **Table III**.

TABLE I: AGE DISTRIBUTION OF THE STUDY POPULATION

Age (years)	Cases (n=175)	Percentage
<30	32	18.3
30-45	92	52.6
45-60	40	22.9
> 60	11	6.2

DISCUSSION

The present report is one of the earliest reports describing breast imaging in mastalgia in local set up. In this series, the reason for imaging (mammography and ultrasound) was pain alone in 28% of the patients. In the study of Locker et al, whose subjects comprised women referred to a hospital breast unit by general practitioners, pain was the presenting symptom or reason for mammography in 14.3%, and the prevalence of breast cancer in these women was 2.4%.[24] This is substantially higher than the projected cancer

TABLE II: RADIOLOGICAL FINDINGS IN THE PAINFUL BREAST(S) IN RELATION TO AGE GROUP. VALUES ARE NUMBERS (PERCENTAGES)

	Age (years)			
Radiological Findings	<30	30-45	45-60	>60
Normal	24 (75%)	64 (69%)	20 (50%)	06 (55%)
Benign	08 (25%)	22 (24%)	12 (30%)	01 (9%)
Probably benign	00	04 (4.3%)	06 (15%)	02 (18%)
Suspicious	00	02 (2.1%)	01 (2.5%)	01 (9%)
Malignant	00	00	01 (2.5%)	01 (9%)

TABLE III: USG CRITERIA FOR DIFFERENTIATION OF MASS LESIONS(n=61)

U/S Features		Frequency
Shape	Round or oval	58
	Irregular	03
Margin	Well defined	50
	Macrolobulated	08
	Ill defined	02
	Speculated	01
Width AP ratio	> 1.4	59
	< 1.4	2
Echotexture	Homogenous	45
	Intermediate	10
	Heterogenous	06
Post echo intensity	Enhanced	26
	Unaffected	18
	Attenuated	4
	Absent	13
Edge refraction	Present	35
	Absent	26
Calcification	Macro	10
	Micro	02
	Absent	49

frequency of 1.1% found in painful breasts in the present study. However, several patients in Locker's study had a palpable breast cancer in the painful breast while presence of a palpable lump was an exclusion criteria in this study.[24] Although frequency of breast cancer in this series was only two (1.1%) among all patient breast, yet it suggest that pain also may be presenting feature in early carcinoma breast. However, these results should be interpreted with caution.

In most patients with painful breast(s) no radiological abnormality was found. The benign findings mainly consisted of small cysts, fibrocystic disease, mastitis, ductal ectasia or fibroadenoma. Fibrocystic changes are most common and frequent benign breast disease.[25] Such changes generally affect the premenopausal women between 20-50 years of age.[26] The difference between the age group in patients with fibrocystic disease differs geographically. The possible reasons being social accustom, age of menarche, parity, breast feeding customs, use of contraceptive pills and self awareness. Mammary duct ectasia, also called periductal mastitis, is a distinctive clinical entity that can mimic invasive carcinoma clinically.[27] In our study, 14% of the patients had duct ectasia.

Most breast masses are benign in young females. Fortunately very few have breast cancers.[28] This study suggests that biopsy of a painful area is not indicated in patients with radiological findings that are not suspicious, as in these cases no breast cancers were overlooked. This strategy is substantially different from the established management of palpable breast lesions, where biopsy may follow a negative radiology report. It is well known that mammography or ultrasonography does not always show whether a palpable lesion is malignant.[29-30] It is also known that about 10-15% of breast cancers can be missed on mammography alone. However, in this study ultrasound was routinely performed on every patient to complement detection of non-palpable lesion. None of the non-palpable lesions grouped radiologically as probably benign proved to be malignant at follow up. The probability of malignancy in such lesions is 0.5-2%. Therefore, periodic mammographic follow up of lesions classified as probably benign may be a reasonable alternative to biopsy.[31, 32]

The primary value of breast imaging in women with painful breasts seems to be that of reassurance, as no abnormalities are usually detected, radiological abnormalities classified as benign do not generally have any clinical consequences, and the frequency of cancer in a painful area is low. Khan SA et al, examined the association between mastalgia and breast cancer by analyzing data of 5463 women; authors found that women who experienced pain were less likely to be

diagnosed with breast cancer. They acknowledged that further investigation is warranted [33] as an alternative of the referral to a breast surgeon. The radiology report can then be used to determine whether the biopsy of a painful area is superfluous in the case of unsuspicious radiological findings. The combined value of mammography and sonography in focal/ diffuse breast pain without a palpable breast mass is 100%.[34,35] The limitation of the study is selection bias, as all those patients with palpable masses were excluded from the study because it is well established that patients with palpable findings warrant diagnostic imaging to exclude malignancy.

CONCLUSION

The particular value of breast imaging in patients with breast pain alone is reassurance. Biopsy of the painful area is unnecessary where the radiological findings are not suspicious. However biopsy and aggressive management should not be delayed in the presence of suspicious clinical and/or radiological findings.

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