Original Article

EFFICACY OF MAMMOGRAPHY IN PALBABLE BREAST ABNORMALITIES IN TELANGANA REGION

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ABSTRACT

To evaluate the role of mammographic imaging in patients with palpable abnormalities of the breast in Telangana region.

Materials and Methods:

Over a period of 3 years, 50 patients aged 30 or above with palpable abnormalities of breast underwent combined mammographic evaluation.

Results: 30 (60%) of the 50 palpable abnormalities had benign assessment, 18(60%) ofthe benign lesions were visible on mammography, 11 (36%) of the 20 benign lesions were mammographically identified at mammography evaluation.1 lesion was occult (4%) and visualized on mammography.

In 10(20%) of the 50 cases, imaging evaluation resulted in a suspicious assessment and all these lesions underwent biopsy and 7 were diagnosed as having malignancy. 10(20%) of the 50 palpable abnormalities had negative imaging assessment finding: of these 5 patients underwent biopsy and all had benign findings. The sensitivity and negative predictive value for combined mammographic and mammography assessment were 100%; the specificity was 90.91%.

Conclusion:

Cancer was diagnosed in 7 of the 50 women who underwent combined imaging for palpable abnormalities of the breast. Combined mammographic and mammography assessment was shown to be very helpful in identifying benign as well as malignant lesions causing palpable abnormalities of the breast.

Key words: Biopsy; breast; mammography; palpable lumps

INTRODUCTION:

Breast cancer is the leading cause of non-preventable cancer deaths among women. Great strides in early detection and improved treatment have decreased breast cancer related deaths.
A palpable mass in a woman's breast represents a potentially serious lesion and requires evaluation by history taking, physical examination and mammography. Breast cancer is one of the best-studied human tumors, yet remains poorly understood. Fortunately a disease process does not have to be understood to be treated successfully, but needs to be detected. Theemphasis on early detection of cancer and not to miss a malignant lesion in early stage of disease and the current medico-legal environment encourage an aggressive biopsy approach to breast problems. The large number of biopsies performed for benign breast abnormalities has long been recognized as a serious problem which have adverse effects on society and on the women who undergo them by increasing the costs of screening projects, causing morbidity, and adding to the barriers that keep women from using a potentially lifesaving procedure.

Mammography is a well-defined and widely accepted technique to evaluate clinically suspected breast lesions and screening for breast cancer. In these patients sonography is an useful adjunctive modality and helps characterizing a mammographically detected palpable abnormality, especially in patients with dense breast[1]. Sensitivity and specificity of sonography or mammography is higher if sonography and mammography are combined.

Medwin Hospitals, Hyderabad between August 2009 and July 2012 to evaluate its role in the management of palpable abnormalities of the breast.

STRUCTURE OF BREAST:

The mammary gland consists of:

a) Glandular tissue
b) Fibrous tissue, connecting its lobes

Adipose tissue, in the intervals between the lobe.
There is no definite capsule for the mammary gland. It is enclosed in subcutaneous tissue, which sends numerous septa into it to support its various lobules. From the part of the fascia which covers the glands send fibrous septa towards the skin and the papilla, these are better developed over the upper part of the breast and constitute the suspensory ligaments.

BREAST CHANGES DURING PREGNANCY

During pregnancy marked ductular, lobular and alveolar growth occurs as a result of the influence of luteal and placental sex steroids, placental lactogen, prolactin, and chorionic gonadotrophin.

Prolactin increases slowly during pregnancy and it induces mammary epithelium to initiateprotein synthesis.

In the first 3 to 4 weeks of pregnancy, marked ductular sprouting occurs with some branching, and lobular formation occurs under estrogenic influence.

At 5 to 8 weeks, breast enlargement is significant, with dilatation of the superficial veins,heaviness and increased pigmentation of the nipple- areola complex.
In the second trimester, lobular formation exceeds ductular sprouting under progestogenic influence. The alveoli contain colostrum but no fat, which is secreted under the influence of prolactin.
At the beginning of the second trimester, the mammary alveoli lose the superficial layer of cells. Before this, as in non pregnant women, the two layer structure is maintained.

In the second and third trimesters, this monolayer differentiates into a colostrum - cell layer and accumulates eosinophilic cells, plasma cells, and leucocytes around the alveoli. As the pregnancy continues, colostrum, composed of desquamated epithelial cells, accumulates.

Aggregation of lymphocytes, round cells, and desquamated phagocytic alveolar cells (foam cells) may be found in colostrum; these are termed as Donne's corpuscles.
IMAGING MODALITIES FOR BREAST DISEASES

MAMMOGRAPHY:

Mammography is the single most important method in diagnosing breast disease. Its areas of application include:

(i) Screening: mammography is the only imaging method to date that is suitable for screening

(ii) Problem solving / Diagnostic: apart from few exceptions mammography is always indicated as a diagnostic method in symptomatic patients. This not only helps physicians in determining whether a lesion is potentially malignant or benign but also screens for occult disease in surrounding tissue.

THE TECHNIQUE

Compared to radiographic studies of other parts of the body, mammography places particularly stringent demands on equipment and image quality. The stringent demands of the technique and positioning make mammography one of the most difficult examinations in conventional radiology. To meet the requirements, mammography requires special tubes that produce particularly low energy radiation. Over the last 70+ years the technique has been developed and refined through the use of dedicated units, compression, Molybdenum targets, standardized techniques, moveable grids, automatic exposure control, high resolution films , rare earth screens, automatic film processing and even greater attention to quality control.

RADIOGRAPHIC VIEWS:

Both screening and diagnostic mammograms routinely start with the standard mediolateraloblique and craniocaudal projections. For further evaluation of suspectedabnormalities supplemental views including exaggerated craniocaudal, spot compression, magnification, vertical lateral, tangential and push-back views may be obtained.

TYPICALLY BENIGN CALCIFICATIONS:

Skin calcifications : are typically small, round to oval with lucent centers.
Vascular calcification: is similar to elsewhere in the body and forms contiguous or interrupted dense paired tubular lines.

Coarse or popcorn like calcification: can be seen in an involuting fibroadenoma.
The large rod shaped calcification of secretory disease/plasma cell mastitis is usually over 1mm in diameter, may have lucent centers and occasionally branch.

Small, dense rounded calcifications are usually considered benign and related to involution
Milk of calcium is benign and represents calcium precipitate in small cysts.
Eggshell calcifications are benign, small amorphous, indistinct, hazy rounded and flake like calcifications may be associated with both benign and malignant processes and are of intermediate concern.

BI RADS CLASSIFICATION:

Radiologists are encouraged to use in their reporting , the terms recommended in the BIRADS published by the AMERICAN COLLEGE OF RADIOLOGY.
Diagnosis should be categorized as[8] :

CATEGORY I: Normal mammogram.

CATEGORY II: Focal benign findings for which nothing further is required.

CATEGORY III: Probably benign finding, short interval follow up suggested.

CATEGORY IV: Indeterminate lesion, biopsy recommended.

CATEGORY V: highly suggestive of malignancy and requires biopsy

DIGITAL MAMMOGRAPHY:

Allows images to be enhanced and transmitted electronically. The ability to alter contrast and brightness permits further evaluation of abnormal areas to identify features diagnostic ofbenign and malignant disease [9,10,11,12]. Although the over all cancer detection rate is similar in screen field and full field mammography, screen- field imaging has better image quality and less artifacts and requires fewer patient recalls[10,11] . In addition to its usefulness in telemammography, digital mammography may be more accurate than traditional mammography. Potential new techniques include three- dimensional imaging, lower dose radiation, dual energy subtraction, contrast-enhancement imaging and computer assisted diagnosis.

MATERIALS AND METHODS

The study was conducted at Medwin Hospitals ,Hyderabad. We included women more than or equal to 30 years referred to this centre with palpable abnormalities of breast during a period of 3 years from August 2009 to July 2012 , who underwent a combined mammographic and mammography evaluation of the breast.
Palpable abnormalities of the breast included in the study had a variety of clinical descriptions, such as palpable lump, thickening, nodularity etc. In all patients studied, the palpable abnormalities were of sufficient clinical concern to be referred for imaging evaluation.

The following information was documented at the time of initial visit- date of initial visit,age of the patient, site of the palpable abnormality and description of the palpable abnormality.

All patients underwent diagnostic mammography, which included standard cranio- caudal, and medial -lateral -oblique views. Later all the patients were subjected to sonography of breast.

Mammography was performed with Philips Diagnost-BC unit. Mammography examination was performed with a 7- 12 MHz transducer of Philips HD 500.

EXCLUSION CRITERIA:

Women below 30 years of age with palpable abnormalities of breast.
Women with fungating mass per breast and mass adherent to chest wall where performing mammography was difficult.

RESULTS:

There were 50 patients with palpable abnormalities of the breast who underwent combined mammographic and mammography evaluation. The palpable abnormalities were reported in 29 patients in the right breast and 19 patients in the left breast and 2 patients on both sides.
Table 1 shows the **age** distribution of patients studied.
Table 2 shows the **descriptors** of the **palpable abnormalities** in the patients studied.
Table 3 shows the **tissue density** on the mammograms in the patient studied.
Table 4 shows the **benign causes** of palpable abnormalities included Cysts (N=10), Fibroadenoma (n=13) Fibrocystic disease (n=2) Duct ectasia (n=2) Fat necrosis (n=1) Intramammary lymph node(n=2)

OBSERVATIONS

TABLE No.1
AGE DISTRIBUTION OF PATIENTS IN THE STUDY GROUP

PATIENTS' AGE GROUP	No. of palpable abnormalities N= 50
30- 39	25
40-49	15
50-59	6
>60	4

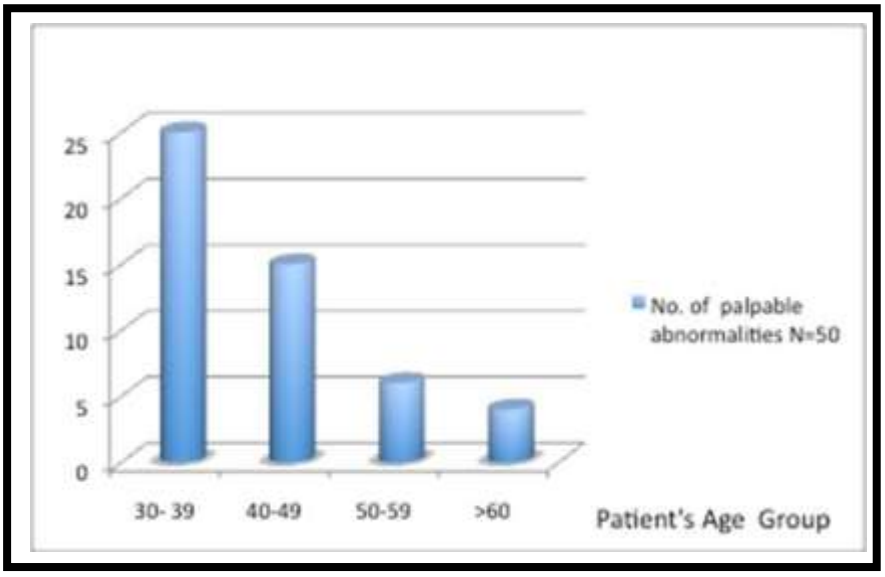


Table 2 :
DESCRIPTORS OF PALPABLE ABNORMALITIES

DESCRIPTOR	No palpable abnormalities n=50
Palpable lump	33
Palpable thickening	6
Nodularity	6
Not specified	5

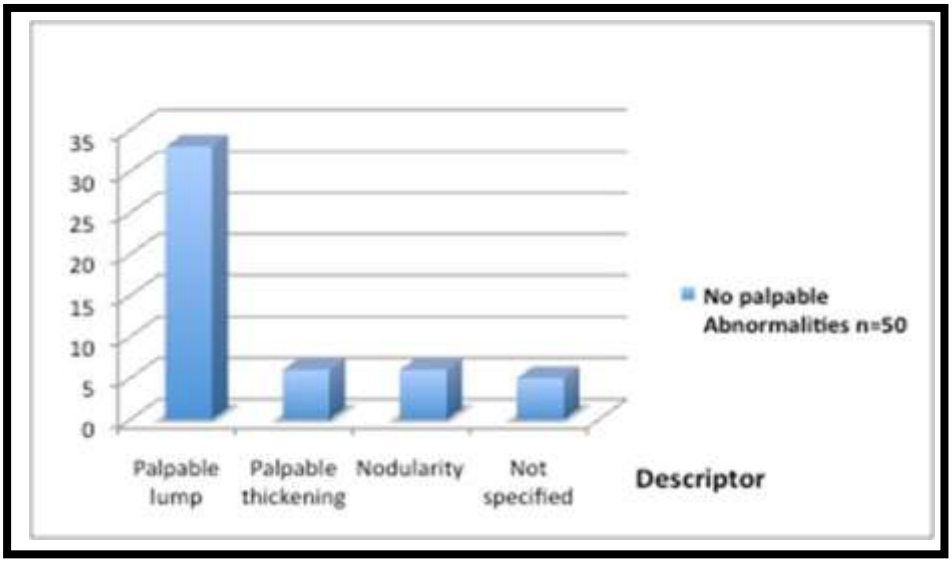


Table 3.
Mammographic Tissue Density in the patients Studied

Breast Parenchymal Density	No. of palpable abnormalities
Scattered fibro glandular Density	25
Predominantly Fatty	15
Heterogenously Dense	3
Dense	2

TABLE 4 :

BENIGN LESIONS	**NO.OF ABNORMALITIES N= 20**
FIBROADENOMA	13
CYSTS	10
DUCT ECTASIA	2
INTRAMAMMARY LYMPH NODE	2
FIBROCYSTIC DISEASE	2
FAT NECROSIS	1

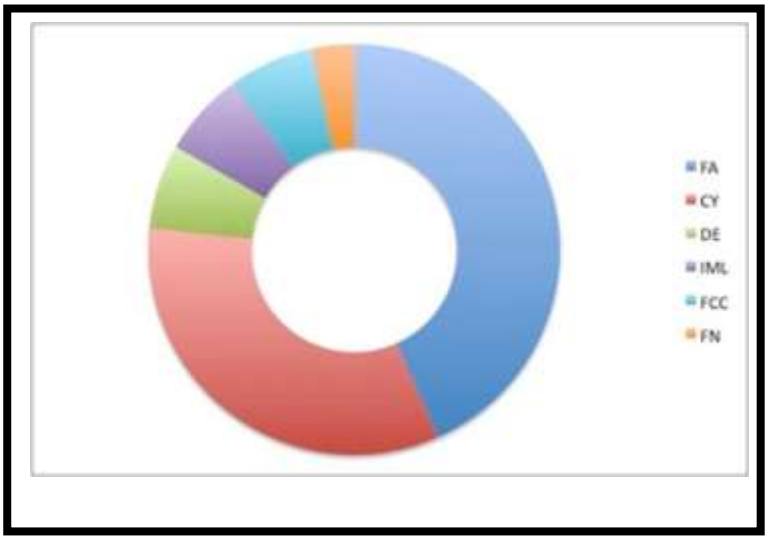
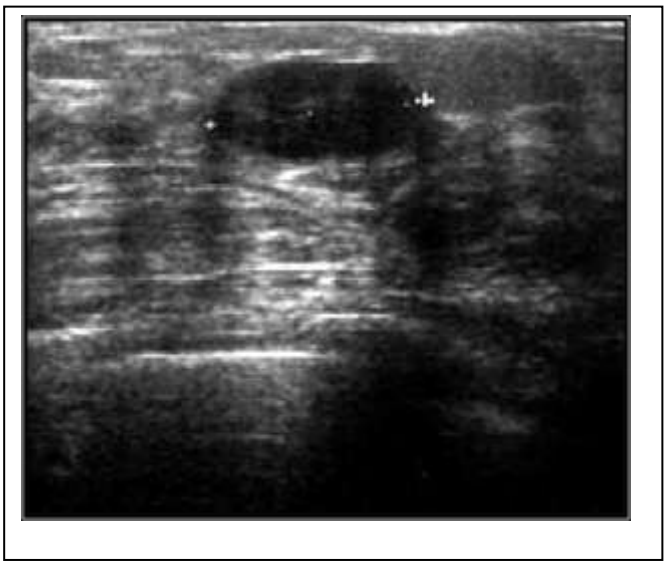


Fig-1

Mammography –Cranio-Caudal view showing a welldefined Radio opacity-Fibroadenoma

Fig-2



Oval hypoechoic solid mass lesion with posterioracoustic enhancement-Fibroadenoma

Fig:3

Well-defined homogenous mass lesion on mammogram,confirmed with ultrasound as benign cyst

Fig-8

Gaint Fibroadenoma

DISCUSSION

Because of the low sensitivity of the mammography in younger women due to dense breast tissue and also low incidence of breast carcinoma in women less than 40 years[44], we have included in our study only women who are 30 and over 30 years of age with palpable abnormalities of breast.

Breast carcinoma has been reported in only 4% of patients with breast symptoms, and even among palpable lesions undergoing biopsy, a large number of lesions turned out to be benign [45,46]. The role of mammography in patients with palpable breast lumps is to show a benign cause for palpable abnormality and to avoid further intervention, to support earlier intervention for a mass with malignant features, screen the remainder of the ipsilateral and contralateral breast for additional lesions, and to assess the extent of malignancy when cancer is diagnosed [47].
However the false negative rate of mammography for breast cancer in patients with palpable abnormalities of the breasts has been reported to be as high as 16.5 %[48]. Multiple studies have shown that the false negative rate for a combined mammographic and mammography evaluation varies from 0% to 2.6%[49,50,51,52].

A small number of palpable masses detected on physical examination are malignant; in this study 14 % of the palpable lesions that underwent mammographic imaging were cancer, compared with 5% in a series of 123 cases of palpable breast thickening reported by Kaiser et al, 5% in 605 patients younger than 40 years reported by Marrow et al, 17% in 750 breast lesions reported by A.T.Stavros et al.

The value of combined mammographic imaging in symptomatic patients has been studied previously. Moss et al reported sensitivity of 94.2% and specificity of 67.9% in 368 patients [53]. Shetty MK and Shah YP reported a sensitivity of 100% and specificity of 80.1%[1]. Barlow et al reported a sensitive of 87% and specificity of 88% and positive predictive value of22 %[2]. Their findings are comparable with present findings of sensitivity of 100 % and specificity of 90.9% in patients with palpable breast lumps.

CONCLUSION

Breast cancer is one of the leading killers in both developed and developing countries. So, the consciousness about this is increasing in the society. Screening for breast cancer is one of the most common prescribed procedures. The main aim of this investigation is to identify the mass and to differentiate whether the lesion is a benign or a malignant disease. The emphasis on early detection of cancer and not to miss a malignant lesion in early stage of disease and the current medico-legal environment encourage an aggressive biopsy approach to breast problems. The large number of biopsies performed for benign breast abnormalities has long been recognized as a serious problem. Excessive biopsies for benign lesions have adverse effects on society and on the women who undergo them by increasing the costs of screening projects, causing morbidity, and adding to the barriers that keep women from using a potentially life saving procedure.
Combined use of mammography and sonography plays an important role in the management of palpable breast lesions. Its applications are as follows:

a. Characterizes the palpable mass lesion.
b. Guides the further course of action based on the findings including prompt biopsy.
c. Avoids unnecessary interventions in which imaging findings areunequivocally benign.
d. Negative findings on mammography have very highspecificity and are reassuring to the patient.

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