

Mammography as a Tool to Evaluate Benign Breast Masses

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ABSTRACT

Introduction: Females are unaware of various breast pathologies and are hesitant to reveal due to some social stigma in developing countries like India, hence usually detected in advanced stages. Therefore aim of present study is to early detection of benign breast masses by mammography.

Material and methods: Present study was carried out on 30 cases of breast tumour attending LLR Hospital & J.K. Cancer Research Institute of GSVM Medical College, Kanpur. Study of breast tumours was made on three pronged i.e. clinical, radiological and pathological. In clinical study history, general examination and examination of breast was done. Radiological Study (Mammography) was carried out in strict privacy. Both cranio-caudal and medio-lateral views were taken as a routine.

Results: Number of cases of fibroadenoma have been 11 (36.67%), carcinoma 17(56.67%), cystic disease of the breast 1 (3.33%) and tuberculosis of breast 1 (3.33%). The benign breast lesions were common in younger age group i.e. 20-42 years (72.8%). Fibroadenoma was more common on right side, right to left ratio being 7:4. Benign breast lesions can be easily diagnosed by radiological examination.

Conclusion: Mammography is useful in early detection of malignancies of breast. However along with USG it has higher sensitivity rate for detection of breast masses.

Keywords: Mammography, Breast Mass, Fibroadenoma, Radiological Examination.

INTRODUCTION

The misery of mankind from malignancy in general and womenkind from breast cancer in particular is the biggest scourge of the modern world. It is an elusive disease claiming victims in all walk of life of almost every age and sex. It has a universal distribution. In fact it is an errant world citizen whose cellular turmoil shows little predilection for race, colour, climate or geographical area.

Breast cancer is the second most common cancer among Indian women, about 52000 women develop breast cancer per year (National Cancer Registry Project).^{1,2} Statics reveal that in India one woman of every 5000 is destined to be prey to this scurrilous disease, the probability increases with the increasing age. Early menarche, late menopause, nulliparity, elderly primi, diminished lactation, family history of breast cancer and other breast disease like fibrocystic disease etc. are the different risk factors generally associated with breast cancer.^{3,4} Other potential risk factors are history of endometrial/ovarian/colon cancer, excessive exposure to ionising radiation.⁵ Lack of awareness, fear of disease etc. are the prominent cause for ignoring and hiding the disease and over 90% of the diagnosed cases are in stage II, III and IV. Therefore an early diagnosis of breast cancer has a

favourable prognosis in comparison of late detection.⁶

Strong clinical suspicion along with family history of breast cancer and discovery of breast mass signals the beginning of breast cancer diagnosis. In most cases, suspicious clinical or radiological findings turn to be benign.^{7,8} Methods for detection of breast cancer are mammography, ultrasonography, colour doppler ultrasound study, Magnetic Resonance Imaging (MRI) etc.⁹ Mammography is the most commonly used method and has proven effectiveness especially in non palpable carcinoma patients.¹⁰⁻¹²

MATERIAL AND METHODS

Present study was conducted on cases of breast tumours attending L.L.R. Hospital, J.K. Cancer Research Institute of GSVM Medical College, Kanpur during year 1993-1994. Study of breast tumours was made three pronged i.e. clinical, radiological and pathological. In clinical study history, general examination and examination of breast was done. Radiological Study (Mammography): The procedure was carried out in strict privacy. Both cranio-caudal and medio-lateral views were taken as a routine. Single breast was X-rayed at a time. In a few extra views were taken through necessary.

Position

For Cranio-Caudal View: The patients was seated on the adjustable revolving stool, besides the X-ray table the position of stool was so adjusted that when the patient was seated the maximum portion of the breast could be placed conveniently on the cassette placed horizontally on the x-ray table, finer adjustments for positioning were achieved by placing pliable card board boxes under the cassette. The head of the patient was turned to the opposite side so as not to hinder the positioning of the over head tube. A marker was placed over the cassette to indicate the side. Care was taken to see the edge of the cassette was firmly pressed against the chest wall; this was achieved by asking the patient to hold the distant edge firmly.

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Centering: The X-ray tube from above was centered so, that the ray passed perpendicular to the film at the point midway between the nipple and the chest wall.

For Medio-lateral View: Patient was placed in the lateral recumbent position on the x-ray table, so that the breast to be examined was nearer the table top. The arm of the side under investigation was extended above the head, so that the axillary folds were not tense but just sufficient to keep the breast in its long axis parallel to the table. To achieve this position of the breast satisfactory further finer adjustment were made by rotation of the patients body; the opposite arm was placed on the side of the body. The position may ultimately be described as how a mother feeds a child lying down. This was very easily understood by the illiterate and lower class patients. As described in connection with the cranio-caudal view the cassette was placed under the breast and the necessary height achieved as before, again care being taken to see that one side of the cassette was well against the chest wall. Fixity of the patient in position was achieved by the help of sand bags and pillows.

Centering: The tube was centered from above perpendicular to the cassette so that the rays passed through a point midway between the nipple and the chest wall.

Apparatus Used

- X-ray machine: 300 Ma IG wipro make X-ray machine.
- X-ray films: Blue tinted double emulsion coated films screen type were used. Film size was 6"X 8".
- Filter: Normally used 1 mm aluminium filter.
- A plate to press the breast against the cassette.

Exposure Factors

KVp in cranio-caudal view was 32-36 and in medio-lateral view was 34-38; mAS was from 80-120 with FFD of 36'

Immobilisation

Immobilisation of patient was essential as long as the exposures were utilised. For this the patient was instructed to take particular care not to move or breadth thereby immobilising the chest wall. This was further added by resorting to the aid of pillow and sand bags whenever necessary.

Processing of Mammographic Film

These films were processed manually in the routine manner with the use of standard processing chemicals. Immediate basic evaluation of pathological mammograms was done in wet films and where necessary repeat films were obtained.

Pathological study: The breast removed at operation was sent for histopathological examination and the patients with lump in breast underwent F.N.A.C. They were studied for evidence and nature of the growth. The axillary glands removed at the time of radical operation were subjected to histopathological examination for any evidence of secondary deposits. The various histopathological types of tumours of breast of our series has been charted and incidence was work out.

Observation

The present study was conducted on 30 cases of breast

masses, which were admitted to or attended the OPD of L.L.R. & associated Hospitals and J.K. Cancer Institute, Kanpur. A thorough clinical, pathological and radiological examination was done. For the purpose of description the cases have been broadly classified as inflammatory, cystic and neoplastic.

Table 1 shows one case of inflammatory breast disease (3.33%), one case of cystic breast disease (3.33%), 11 cases of Fibroadenoma (36.67%) & 17 cases of Carcinoma

Lesion	Number of Cases	Percentage of Cases
Inflammatory	1	3.33
Cystic	1	3.33
Benign (Fibroadenoma)	11	36.67
Carcinoma	17	56.67
Total	30	100.00

Table-1: Distribution of Breast Lesions under study

Age Group in Years	No. of Cases	Percentage
< 20	2	18.18
21-30	2	18.18
31-40	4	36.67
41-50	2	18.18
51-60	1	9.09
>60	0	0.00
Total	11	100.00

Table-2: Age Wise Distribution of Benign Breast Lesions (Fibroadenoma)W

Duration of Symptoms	No. of Cases	Percentage
4 Months- 1 Years	3	27.27
1-2 Years	2	18.18
2-3 Years	3	27.27
3-4 Years	2	18.18
4-5 Years	1	9.10
5 & >5 Years	0	0.00
Total	11	100.00

Table-3: Duration of symptoms in Benign Breast Lesions

Side of lesion	Site of lesion	No. of Cases
Right breast	Upper & outer quadrant	2
	Upper & inner quadrant	1
	Lower & inner quadrant	0
	Lower & outer quadrant	0
	Lower inner & outer quadrant	1
	Sub areolar	1
	Total	7
Left breast	Upper & outer quadrant	2
	Upper & inner quadrant	1
	Lower & inner quadrant	0
	Lower & outer quadrant	0
	Lower inner & outer quadrant	1
	Sub areolar	1
	Total	7

Table-4: Side & Site of lesion in Benign Breast Lesions

Parity	No. of Cases	Percentage
Nullipara	1	9.09
Para 1	2	18.18
Para 2	1	9.09
Para 3	4	36.37
Para 4	1	9.09
Para 5	0	0.00
Para 6	1	9.09
Para 7	0	0.00
Para 8	1	9.09
Para 9 & above	0	0.00
Total	11	100.00

Table-5: Parity wise Distribution of Cases of Benign Breast Lesions

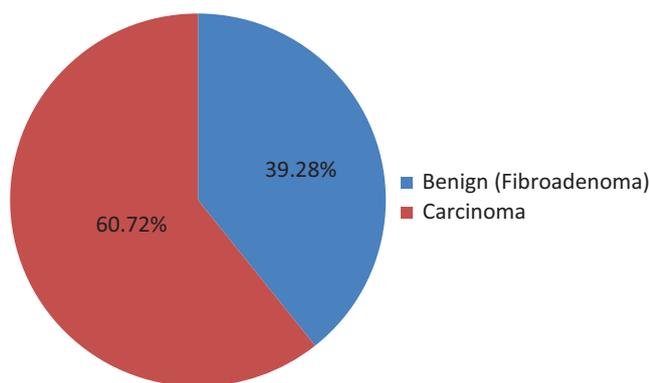


Figure-1: Distribution of Neoplastic Breast Lesions

(56.67%). No case of Sarcoma breast was encountered. Figure 1 shows that in neoplastic breast lesions 11 cases (39.28%) were fibroadenoma while 17 cases (60.72%) were of carcinoma.

The majority of cases (72.8%) of fibroadenoma were in adult age group (21-50 years). Two cases were from child bearing age i.e. below 20 years. One case was 55 years old. The youngest age at which a fibroadenoma was noticed was 20 years and oldest was 55 years. (Table 2)

The mode of onset was gradual. The duration of symptoms varied from 4 months to 14 years. The majority of fibroadenomas were of recent origin or 2-3 years duration. All the cases with fibroadenoma presented with complaint of lump in the breast which was slightly firm, rounded and very mobile. (Table 3)

Table 4 shows that out of 11 cases of fibroadenoma 7 (63.64%) were in the right breast while 4 (36.36%).

In the present study majority of cases of fibroadenoma belonged to para-3. (Table 5)

Mammographic Findings: The nipple was normal in all the cases and no change was noticed. Skin was also normal in all these cases. The subcutaneous tissue was normal in all the cases and no changes were noticed.

Corpus Mammae: The Corpus mammae showed a well defined mass relatively of increased density of varying size from 1”x 1.5” to 4”x 5”. The situation was variable; they were seen to arise from the base of the breast. Most of them were round, few were oval and smooth in contour except two

cases which were polylobulated.

Histopathological Correlation: All the 11 cases belonging to benign group of neoplastic breast lesion were subjected to operative therapy. In most of the cases, excision of the tumour mass was done and sent for histopathological examination. All were fibroadenoma but 2 of them were of pericanalicular type.

DISCUSSION

Inspite of the fact that radiological examination (mammography) in diseases of breast has been explored and investigated for some time, now it still remains to be accepted as a routine diagnostic examination. Acclaimed widely as a great assistance to detection and consequently control of breast cancer, it has failed to attain its convincing place. The reasons for this failure has been many, faulty technique, insufficient correlation between radiological and pathological data, and lack of standard classification with the co-operative effort and mutual interest of the pathologist and radiologist.

In order to bring about this correlation between the roentgenological and pathological findings in diseases certain nomenclature has to be utilised. Out of this “Cheate and Cutlers” classification which is based on fundamental concepts in accordance with the clinic-pathological findings, facilitating the roentgenographic study in the diseases of breast is very common (J. Gershon Cohen and H. Ingleby 1963, Leborgne R.1951,53.)

Besides the one tubercular case and one case of galactocoel, the rest 28 cases of the present study were of neoplastic breast disease, 11 benign and rest 17 malignant. The majority of cases (72.8%) of fibroadenoma were in adult age group (21-50 years). Two cases were from child bearing age i.e. below 20 years. One case was 55 years old. There was a single case of post-menopausal age group. The mode of onset was gradual in all these cases. However, the duration of the condition has been found to be far longer in fibroadenoma than any other neoplastic breast disease.

In all cases a mass of increased density was the cardinal mammographic feature. The accompanying capsule formation and displacement of the surrounding tissue was also very specific in all the mammograms, but the nipple, skin and subcutaneous tissue showed little change.

The size of the mass has been found to be relatively small (1X 1.5 cm to 5X 4cm) but it was larger than the clinically observed palpable mass in fibroadenoma. In fibroadenoma, the mass has been found to be at the base of the breast. Found with smooth contour as against its situation in the outer half of the breast with irregular shape and contour in carcinoma. In fibroadenoma the density of the mass at times was nearly similar to that of the normal surrounding tissue so much so that it was very difficult to exactly position the lesion very aptly designated as the fleeting mice in view of its mobility and floating tendency fibroadenoma are frequently reported to be present in both breasts. However in the present study no such patient came across.

These young adults with appropriate history and clinical presentation of the lump by palpation which mammogram fail to visualise are prima facie evidence of fibroadenoma (J. Gershon Cohen and H. Ingleby 1952, Leborgne R. 1951, 53) in view of the density of the mass as observed above.

Criteria of Benign Breast Lesions

The following criteria of benign tumour masses have been noted by Herman C. Zucker Mann in 'Progress in clinical cancer' edited by Irving M. Ariel Vol. 1.

1. Cysts and fibroadenoma when discernable through the veil of connective tissue surrounding them are sharply marginated entities.
2. They are non invasive and surrounded in part by a thin fatty capsule.
3. As with other benign lesions, they simply displace the adjacent glandular pattern without disrupting it.
4. In fibroadenomas, degenerated and coarse calcified are may be found at several places.
5. Benign masses appear smaller to palpation than their x-ray counterpart, an appearance possibly due to compressibility.

Dr. Eric Samuel of the department of Diagnostic Radiology, Edinborough University found the following characteristics of the benign lesions:-

- Smooth round or oval opacity.
- Halo sign or ligne de securite.
- Often less dense than malignant lesion.
- Clinical size equal to or less than radiological size.
- Other signs of breast dysplasia.

CONCLUSION

In this series, only those cases were subjected to mammographic examination that definitely had a lump in their breast and an attempt was made to correlate the clinical, radiological and histopathological findings. On the basis of results of present study following conclusions have been drawn. Firstly the number of cases of fibroadenoma have been 11 (36.67%), carcinoma 17(56.67%), cystic disease of the breast 1 (3.33%) and tuberculosis of breast 1 (3.33%). The benign breast lesions were common in younger age group i.e. 20-42 years (72.8%). Fibroadenoma was more common on right side, right to left ratio being 7:4. Benign breast lesions can be easily diagnosed by radiological examination.

Therefore mammographic examination should be done in all the cases coming to the hospital with lump in their breast to ascertain the nature of the tumour mass, and also in those cases that refuse for excisional biopsy. But it must be made clear that mammography is a higher skilled procedure and requires the co-operation of surgeon, radiologist and the histopathologist.

REFERENCES

1. Annual report, 1984. National cancer registry. A project of Indian council of medical research, New Delhi 1987.
2. National cancer registry programme, Biennial report 1988-1989, An epidemiological study, Indian council of medical research, New Delhi 1992.

3. Farewell VT, Bulbrook RD, Hayward JL. Risk factors in breast cancer: A prospective study in the island of Gnernsy, in early diagnosis of Breast cancer. New York: E. Grandmann and L. Beck Gustav Fisher verlag Stuttgart, 1978: 43-51, 1978.
4. The breast cancer digest. US deptt. of Health, Education and welfare. Public health service, NIH, National cancer Institute, Bethesda, Maryland - 202201. NIH Publication, 1979: 80 - 1691.
5. Nair MK, Sankaranarayanan R, Nair KS, etal. Overall survival from breast cancer in Kerala, India, in relation to the menstrual, reproductive and clinical factors. Cancer 1993; 71: 1791 - 6.
6. Schmitt EL, Threatt B. Characteristics of breast cancer in an incident cancer population. AJR 1984; 143: 402-406.
7. Baker LH. Breast cancer detection demonstration project: five year summary report. CA Cancer J Cline 1982; 32: 194 - 225.
8. Verbeek AL, Hendriks JH, Holland R, Marvunac M, Sturmans F, Day NE. Reduction of breast cancer mortality through mass screening with modern mammography: first results of the Nijmegen project, 1975 - 1981. Lancet 1984; 1: 1222 - 1224.
9. Khalkhali I, Cutrone JA, Mena I, et al . The usefulness of scintimammography (SMM) in patients with dense breasts on mammogram. J Nucl Med, 1995; 36: 52.
10. Ciatto S, Cataliotti L, Distante V. Nonpalpable lesions detected with mammography: review of 512 consecutive cases. Radiology 1987; 165: 99 - 102.
11. Kopans DB. Positive predictive value of mammography. AJR 1992; 158: 521 - 526.
12. Chakraborti KL, Bahl P, Sahoo M, Ganguly SK, Oberoi C. Magnetic Resonance Imaging of Breast Masses: Comparasion with Mammography. IJRI.2005;15:381-7.

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