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ORIGINAL ARTICLES

MAMMOGRAPHIC AND SONOGRAPHIC FEATURES IN CARCINOMA BREAST

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ABSTRACT

Background: The most common malignant disease among the females is carcinoma breast. Its management requires team effort, in which modern imaging techniques play an important rote, in diagnosis and assessing the severity of disease.

Material and Methods: A total number of 71 patients were studied from 01 January 2000 to 30 August 2001 at CMH Rawalpindi. The age range was 19-65 years. Duration of disease ranged from 2-6 months. Sixty three patients were married and eight were unmarried.

Results: On mammogram, the lesion pick up rate was 88%, that is 62 out of 71 patients. Mostly the lesion appeared as dense irregular mass. False negative cases were seen in patient s with dense glandular breasts. On ultrasound, lesion pick up rate was 93%, that is 66 out of 71 patients. In most of cases lesion appeared as solid hypoechoeic or heterogeneous mass with irregular margins and posterior shadowing.

Conclusion: It is concluded that when the mammography and sonography are used simultaneously the diagnostic yield is very high, that is, in 85% of cases, there is agreement of findings. It is also concluded that the mammographic and sonographic features of Ca breast are not 100% diagnostic and false negative cases do exist.

Keywords: Carcinoma, calcification, hypoechoeic, mammogram, ultrasonography

INTRODUCTION

Breast Carcinoma is the most common malignant disease among the females. Its management requires a multidimensional approach and collaborated team effort by different specialties. Radiological assessment, using modern equipment and imaging techniques is an essential aspect both in the diagnosis and assessment of severity of disease [1] which would help the clinicians to decide on the type of treatment in accordance to the stage of cancer, and most useful to the patient.

In addition, to routine Craniocaudal and Mediolateral Oblique views, magnification and spot compression can be used with any of the views, for detailed visualization of the lesion. In some cases tengantional views are taken to differentiate tumor recurrence form post procedural changes.

Ultrasound is non invasive, low cost, readily available modality. It gives information regarding identification of palpable and non palpable lesions, their texture, size and multiplicity. It is helpful in under taking interventional procedures like biopsies and for evaluation of breast implant associated problems.

The purpose was to define specific features of Carcinoma breast on two

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standard imaging modalities i.e Mammography and USG, in order to detect and diagnose this very common malignant disease at an early stage.

PATIENTS AND METHODS

It was a correlation study, carried out in the Radiology Department of Combined Military Hospital and Military Hospital Rawalpindi. The diagnosed patients of carcinoma breast who were biopsy proven, were included. All patients were adults. Primarily the females but one male case was also assessed. Only preoperative patients before mastectomy were included. Patient with lump breast having benign lesion on biopsy, Post operative patients (Mastectomy done), unwilling patients and patients with metastatic deposits in the breast were not included. Written and informed consent was taken from the patients. The patients were subjected to mammography and then ultrasound examination. The features of both modalities were then correlated.

Ultrasound Machine LOGIC-500, by General Electronics, Medical System which had printing facility and the probes of varying frequencies including 5 MHz to 7.5 MHz linear array were used.

For Mammography standard two views were performed, using dedicated film-screen mammographic equipment. Additional views were taken where needed [2]. Mammography was carried out on "Mammomat by Siemens (Germany), Model Number 80. 30 – 27 x 1047 by which standard mammograms of satisfactory image quality were obtained. Two standard views were taken namely Craniocaudal and Mediolateral oblique views. Adequate exposure with high mAs and low kVp were used.

RESULTS

A total of 71 patients under went the study. The age range was 19 – 65 years with

Table-1: Mammographic features of carcinoma

Features	Percentage
Dense Mass	88%
True Positive Cases	88%
Margins	
a. Spiculated	64%
b. Irregular/Indistinct	24%
Lesion Diameter	
a. Less than 1 Cm	27%
b. More than 1 Cm	73%
Calcifications	45%
a. Suspicious	20%
b. Benign	25%
Second Primary Cancer	
a. Ipsilateral Breast	2%
b. Contralateral Breast	1%

Table-2: Sonographic features of carcinoma

Features	Percentage
True Positive Cases	93%
Ratio of Height to Width	
a. > 1	47%
b. < 1	53%
Margins	
a. lll-defined and irregular	89%
b. Well defined	4%
Shadowing	
a. Marked	49%
b. Partial	5%
c. None	46%
Hypoechoic or Heterogeneous	93%
Calcifications in the mass	11%

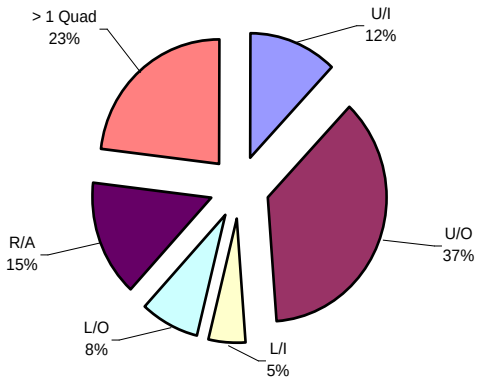

Fig: Prevalence of disease in various quadrants of breast

U/I	=	*Upper inner*	*12%*
U/O	=	*Upper outer*	*37%*
L/I	=	*Lower inner*	*5%*
L/O	=	*Lower outer*	*8%*
R/A	=	*Retro areolar*	*15%*
> 1 QUAD	=	*More than one quadrant involved in the disease*	*23%*

mean age of 46 years. The female to male sex ratio was 99:1. Duration of disease ranged from 2 – 6 months with mean time of 2.5 months. Out of 71 patients 63 were married and 8 were unmarried. Patients who had breast fed their children for more than 1 year were 24 less than 6 months were 33 and 7 patients were infertile. Quadrant mostly involved was upper/outer i.e. in 26 patients (37%). Refer to (figure).

The mammographic findings are summarized in (table–1). On mammography 62 out of 71 patients mammograms showed a dense mass. Out of these, 45 had spiculated margins and 17 had irregular or indistinct margins. Calcification was seen in 31 cases. The calcifications included clustered, punctate, coarse, micro or macrocalcification. Nipple retraction was seen in 35 cases, discharge was present in 9 patients. Skin changes including thickening, dimpling were present in 17 patients. Axillary node involvement was seen in 13 patients.

On Ultrasound the tumor was mostly seen as a solid hypoechoie or heterogeneous mass with irregular margins and posterior acoustic shadowing in 34 patients. Height greater than width was seen in 33 patients and foci representing calcification were seen in 7 patients. Complex cystic masses were seen in two patients including one male. Sonographic findings are summanzed in (table-2).

Correlation of the results showed that the masses which appeared solid on mammogram, some of them consisted of complex cystic masses on Ultrasound. The exact extent of the tumor i.e., the size of the tumor was better demonstrated on Ultrasound, because it provides real time image without magnification. Calcification visible on mammography, whether macro calcification or micro calcification, were rarely identified on Ultrasound. The primary features of the tumor such as the margins, whether irregular, knobby, spiculated or partly indistinct, almost gave the same appearance on both modalities. Secondary features such as nipple retraction, skin involvement and axillary node enlargement were well appreciated on both modalities. After detailed evaluation of Mammographic and Sonographic findings, it was estabilished that, in 85% cases there was an agreement of findings in both the modalities and the disparity was mostly in false negative cases.

DISCUSSION

Carcinoma breast has an ancient history, Breast tumors were described by Egyptians 3000 years Before 'Christ [3]. With the increased awareness and use of percutaneous biopsy technique the number of detected cases of Carcinoma breast, has increased considerably among the Pakistani population. The aim of study was to assess the specific features of Carcinoma breast on USG and mammography, which are noninvasive standard techniques and whether the mammographic features correlated with Ultrasound features or otherwise.

Mammography is the main imaging modality. It is inexpensive, and noninvasive, although it possesses some radiation hazard, requires skilled staff and dedicated equipment. Mammogram can detect small non-palpable lesions. It shows the extent and location of tumor, architectural distortion, micorcalcification [5], skin and nipple changes and lymphaderopathy. It also detects the multi centricity of the tumor. Some cases however, are mammographically occult, specially in dense breast, intracystic growths and postoperative cases. This study matches with previous published reports, i.e. Carcinoma is identified on mammography as a dense mass with irregular or spiculated borders [6]. Spiculated borders seen in 64% and indistinct margins in 24% cases (Refer to case 1 and 2). Micorcalicifications on mammography has been described in 8 – 19% cases [4]. In our population, the % of calcification was 45%; it included clustered,

punctate, coarse, micro calcification or macrocalcification. In one study it was suggested, that presence of calcification is useful for differentiating invasive Carcinoma from radial scar [7]. In this study the differentiation of malignant spiculated lesions from radial scar, could not be done on the basis of presence or type of calcification. In a published study the sensitivity of mammography was found to be 90% and specificity for distinguishing malignant from benign lesion was only about 20 to 50%. The sensitivity of mammography for detection of Carcinoma breast was calculated to be 88% in this study. The false negative cases were 12, out of these, six patients had dense breasts (due to younger age/hormone replacement therapy) and the lesions could not be well demarcated. Three patients had recurrence of tumor after lumpectomy/partial mastectomy. Two patients had intracystic growth, on mammogram, the margins of which appeared smooth/distinct and in one patient who was male, the mammography was not very conclusive. There were no false positive or true negative cases as all the patients were biopsy proven.

The lesions that are non palpable and occult on mammography can be detected on Ultrasound [8]. It is low cost and free of side effects and is a complimentary imaging investigation that provides the details of structural changes in parenchyma and solid or cystic nature of the tumor. In addition to, the evaluation of lesion, it helps to guide Fine Needle Aspiration, Core Needle Biopsy. It can assess multicentricity of disease, which would allow a more accurate preoperative diagnosis so that the patient and the doctor can make decisions regarding the selection of appropriate surgical procedure, such as segmental or total mastectomy with immediate reconstruction [9]. New advancements in Ultrasound [10] like Pulse Doppler and Color Flow Mapping have further augmented the capability of Ultrasound in diagnosis and management of Carcinoma breast. In my study, most of the carcinomas were hypoechoic; a few had heterogeneous echo texture. All tumors had ill defined or irregular margins. These were firm on compression. Posterior acoustic shadowing was seen in 49 patients. The posterior acoustic shadowing is however not a unique feature of malignancy and may be seen in benign fibrous lesions. The hypoechoic nature is not specific for malignancy and some benign diseases may also have this feature. The smallest tumor detected was 0.7 cm.

The height to width ratio of more than one is indicative of malignancy. However, in my study a ratio of less than one was seen in 53% of cases. The compressibility was not seen in any of the cases. In a study the author has expressed the sensitivity of 98.4% and specificity of 67.6% for malignant lesions. In this study a sensitivity of 93% was found for malignant or indeterminate lesions. A false negative of 7% was found, out of which 5% patients had small and non-palpable lesions and 2% were elderly or very ill. There were no false positive or true negative cases as all the patients were biopsy proven.

After detailed evaluation of Mammographic and Sonographic findings, it was concluded that, in 85% cases there was an agreement of findings in both the modalities, and when used together, they have a very high diagnostic yield. In the study, we have found that the mammographic and sonographic features of Ca breast are not 100% diagnostic and false negative cases do exist.

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