

ORIGINAL ARTICLE

SONOMAMMOGRAPHIC EVALUATION AND CHARACTERIZATION OF BREAST LUMPS

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ABSTRACT

Introduction: Modern breast USG is an established, ideal and accurate tool for the investigation and characterization of breast lumps. It also compliments X-ray mammography in further evaluation and diagnosis of breast masses and thus avoids unnecessary breast surgeries in benign conditions. We present a case series of 64 patients with ultrasound findings in various breast lumps and pathologies.

Aims & Objective: In this study we planned to evaluate and characterize breast lumps with USG examination.

Material & Method: The present study was conducted in the Department of Radio-diagnosis, GMERS, Patan. Patients under study were referred from the department of Surgery, medicine and gynaecology & obstetrics. Patients included for study were evaluated by Clinical and Ultrasound examination. Histopathological confirmation was done in all the cases by FNAC/ excision biopsy.

Result: On examination distribution of lesions was found to be Fibroadenoma (31.1%), Breast cyst (20.7%), Intraductal papilloma (5.2%), Lipoma (3.4%), Breast abscess (3.4%), Galactocele (3.4%), Cystosarcoma phyllodes (3.4%), Hamartoma/ Fibroadenlipoma (3.4%) & Fat necrosis (3.4%), Invasive ductal carcinoma (17.4%), Invasive lobular carcinoma (5.2%).

Conclusion: Sonomammography is a very dynamic and powerful tool for the evaluation of lumps. It considerably improves the visualization and evaluation of tumors in radiodense breasts as well it improves the specificity of mammography when used to complement X-ray mammography.

Keywords: Breast, Ultrasound, Sonomammography, X-Ray mammography

INTRODUCTION

As there is increased awareness and incidence of breast cancer in women, a breast lump may alarm both the patient and clinicians. Breast sonography is appropriate modality in the initial evaluation of a woman younger than 30 years with a palpable lump and also helpful in the evaluation of mammographic masses, focal asymmetric densities, and palpable abnormalities not seen mammographically.¹ Although the cause may be benign, additional evaluation and histopathological confirmation might be needed.

Sonographic feature analysis of breast masses continues to improve², though inter observer variability continues to be a problem, in avoiding biopsy.^{3,4} An illustrated Breast Imaging Reporting and Data System (BI-RADS) ultrasonographic lexicon⁵ may be helpful in improving observer performance.

MATERIAL & METHOD

The present study was conducted in the Department of Radio-diagnosis, GMERS, Patan. Patients under study were referred from the department of Surgery, medicine and gynaecology & obstetrics. Patients included for study were evaluated by Clinical and Ultrasound examination.

Patient Evaluation

Patients were evaluated along the following lines.

A. Clinical examination

A detailed clinical history was taken from all cases, general physical and local examination were carried out.

B. Radiological evaluation

Ultrasonography

High-resolution real time sonography of the breast lumps was done in all patients. Scanning done with

7-10 MHz transducers on Medison Diagnostic ultrasound system installed in Department of Radio-diagnosis, TMMC & RC, Teerthanker Mahaveer University, Moradabad. The sonographic examination for inner part of breast was performed in supine position and for the outer part of breast; patient was placed in contralateral posterior oblique position with the ipsilateral arm raised. Scanning was performed in transverse and sagittal planes. Color Doppler (CD) & Power Doppler (PD) also used for assessment of vascularity of the lesion. Histopathological confirmation done in all the cases by FNAC/ excision biopsy.

RESULTS

Table 1: Lesion detection on breast USG examination (n=64)

Nature of Lesion	Cases
Lesions	58
Indeterminate	2
Normal	4

Table 2: Ultrasonic characterization of breast lesions (n=58)

Nature of Lesion	Cases (%)
Fibroadenoma	18 (31.1)
Breast cyst	12 (20.7)
Intraductal Papilloma	3 (5.2)
Lipoma	2 (3.4)
Breast Abscess	2 (3.4)
Galactocele	2 (3.4)
Cystosarcoma Phyllodes	2 (3.4)
Hamartoma/Fibroadenlipoma	2 (3.4)
Fat Necrosis	2 (3.4)
Invasive Ductal Carcinoma	10 (17.4)
Invasive Lobular Carcinoma	3 (5.2)

Table 3: Histopathological Categorization of lesion detected on breast USG examination (n=56)

Nature of Lesion	Cases (%)
Benign	41 (73.2)
Indeterminate	2 (3.5)
Malignant	13 (23.3)

DISCUSSION

In our series, 64 patients with complaints of breast lumps were assessed. Mostly patients presented with clinical features of lumps/swelling, pain, nipple discharge and combination of these complaints. Out of 64 patients, lesions were detected in 58 patients on ultrasound examination, while 4

patients were normal on clinical & ultrasound examination and two patients were with indetermined lesions on USG. Fibroadenoma were the largest group, representing 31.1% (18 out of 58) of lesions. It is usually seen in young women. On ultrasound it is usually homogenous, well defined, hypoechoic, ellipsoid, wider than tall, and may even show posterior enhancement. It may also present with foci of calcifications within. The calcifications within a fibroadenoma are coarse and may show posterior acoustic shadowing. Complex fibroadenomas have a higher incidence of transformation into breast cancer.⁶ On CD & PD, mostly lesions presented with mild/ absent vascularity.

Breast cysts comprised 20.7% (12 out of 58) of lesions. It shows either simple or complex cystic features on USG. A significant number of complex cysts, especially those with a solid intracystic components, may turn out to be malignant on histopathology.⁷ On USG simple cysts presented as completely anechoic lesion, with a thin echogenic capsule, posterior acoustic enhancement, and thin clear edge shadow. Complex cysts showed internal echoes, septations or thick irregular walls. Sometimes it may appear as hypoechoic or solid echogenic lesion, depends on its contents. On CD & PD mostly lesions present with increased peripheral vascularity. Air shadowing was also noted along with inflammatory changes in adjacent breast parenchyma. Intraductal papillomas comprised of 5.2% (3 out of 58) of all lesions. Papillomas in the breast may be intracystic (Figure) or intraductal. They are difficult to differentiate from papillary carcinomas only on sonography and a FNAC/biopsy is required for confirmation. In our study, most of the patients with clinical complaint of bloody nipple discharge were turned out to be Intraductal and Intracystic Papillomas/papillary carcinoma. On USG it presented as a complex cystic lesion with an intracystic, solid, polypoidal echogenic mass of varying sizes. On CD & PD, lesions presented with increased vascularity within solid echogenic component. 2 out of 58 lesions (3.4%) were turned out to be lipoma. These are fatty tumors in the breast parenchyma and may vary in appearance on USG, ranging from uniformly echogenic to heterogeneous or completely anechoic lesions. In our study, breast USG showed well-defined, oval, echogenic mass lesion partially compressible on probe pressure, without any significant vascularity on Doppler. 2 out of 58 (3.4%) lesions turned out to be breast abscess. Acute breast abscesses may occur during lactation and are clinically present with high-grade fever, painful

lump, skin erythema and oedema. On USG, it showed a large complex heterogeneous cystic lesion with mobile internal echoes and adjacent inflammatory breast tissue with increased peripheral vascularity on CD & PD.

2 out of 58 (3.4%) lesions turned out to be galactoceles, which usually occur during lactation or shortly after breastfeeding is stopped, are mostly caused by an obstructed milk duct. In our study, both patients presented with complaint of breast lump during lactation. On USG, it showed a complex mass lesion filled with uniform dense echoes. On aspiration, this yielded a milky substance 2 out of 58 lesions (3.4%) were turned out to be cystosarcoma phyllodes. These are rapidly growing, benign-looking lesions with internal cleft and cystic spaces and moderately vascular on Doppler.⁸ They are fibroepithelial stromal tumors that may be benign or malignant. Recurrence rate is high and may rarely metastasize. In our study, both patients presented with complaint of rapidly growing breast lump. On USG, it showed a well-defined, lobulated, hypoechoic, encapsulated, with multiple, linear, anechoic internal "clefts" and cystic spaces. On CD & PD, lesions presented with increased vascularity 2 out of 58 (3.4%) lesions turned out to be hamartomas. These are fat-containing, benign tumors in the breast, with varying amount of fibrous and fatty components. On USG, it showed heterogeneous nature with mixed hypoechoic, echogenic areas and focal calcifications within. 2 out of 58 (3.4%) lesions turned out to be of fat necrosis.

Fat necrosis is a common entity. However, may pose difficulty to clinicians and sonologist. Fat necrosis may result from accidental trauma, after surgery or radiation therapy. The sonographic features of fat necrosis are varied and depend on the degree of fibrosis. In our study, on USG, it showed complex mass with echogenic bands that shift in orientation with changes in patient position, and an echogenic mass with posterior acoustic enhancement in other patient. 10 out of 58 (17.2%) lesions showed malignant features on USG and turned out to be invasive ductal carcinoma on histopathology. On USG, it presented with irregular, ill-defined, microlobulated, heterogeneously hypoechoic lesions with infiltrative indistinct margins. These lesions were taller than wide in dimension.

3 out of 58 (5.2%) lesions showed malignant features on USG and turned out to be invasive lobular carcinoma on histopathology. This is the second most common breast malignancy and may

be seen in elderly women. It is often missed on X-ray mammography. On sonography, its appearances are variable, ranging from lesions similar to ductal carcinomas to barely visualized areas of architectural distortion with picket-fence shadowing. Some of these tumors may even not visualized on USG.⁹ In our study, it showed large, ill-defined, heterogeneous, hypoechoic lesions with area of architectural distortion on USG. On histopathological confirmation out of 58 lesions, 41 lesions turned out to be benign, malignancy were detected in 13 lesions and 2 lesion were remain of indeterminate category.

CONCLUSION

Sonomammography is a very dynamic and powerful tool for the evaluation of breast lumps. The advantages of USG include good availability, cheaper, fast, with no ionizing radiation. As well as it helps in the assessment of vascularity of the lesion. USG should be used as the primary investigation or in conjunction with X-ray mammography for the evaluation and characterization of the breast lumps.

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