Research Article

Evaluation of Breast Density and Clinical Presentation of Breast Cancer Patients at Tertiary Care Hospital

Dr. Naveen Thakur1 & Dr. Manjit Sehgal*

1Junior Resident, Department of General Surgery, Indira Gandhi Medical College Shimla, 17100 HP, India

Abstract: **Background**: Mammographic breast density is well known and one of the most important non-modifiable risk factors of breast cancer, which increases breast cancer risk by about five times for those with percent density ≥ 75% compared to women with percent density <5%. The present study was done to characterize the breast density and pattern of presentation in breast cancer patients. **Material & methods**: Present study was conducted in the Department of General Surgery and Radio diagnosis IGMC Shimla from 1st July 2018 to 30 June 2019. A total of 30 patients of breast cancer were included and evaluated in the present study. **Results**: The mean age of patients was 55.4±10.9 years. In our study, maximum 12 patients were in the age group of 40-50 years followed by 9 patients in age group of 51-60 years. Among all 30 patients, 28 patients complained of breast lump, 1 patient presented with nipple discharge and 1 patient was subjected for screening mammography. Among all 30 cancer patients, 5 patients (16.7%) had breast density of Type A, while majority of patients i.e 21 patients (70%) had breast density of Type B and 4 patients (13.3%) had breast density of Type C. Among all 30 breast cancer patients, 10 patients (i.e. 33.3%) were BIRADS 4, 14 patients (46.7%) were BIRADS 5 and 6 patients (20%) were BIRADS 6. Among all 30 cancer patients, 27 patients were diagnosed with duct cell carcinoma (90%) while 2 patients were reported as lobular carcinoma (6.7%) and 1 patient was diagnosed with tubular carcinoma (3.3%). **Conclusion**: Maximum patients in this study were in the age group of 40-50 year. The most common presenting complaint in breast cancer patients was breast lump. Most patients had higher BIRADS 5&6 and had breast density of Type B. Majority of the patients were reported as Duct Cell Carcinoma.

**Keywords**: Breast Density, Pattern of Presentation, Breast cancer patients.

---

INTRODUCTION

The ever rising mortality rate despite of increased awareness and widespread use of mammography has opened avenues for evaluation of factors predicting tumor progress which in turn are necessary to develop adequate therapy regimes for different types of breast cancer.1 Mammography has the distinct capabilities of detecting non-palpable lesions thus identifying very early breast cancer lesions.2 Mammographic Breast Density refers to the appearance of breast tissue on a mammogram. Dense breasts contain more fibrous and glandular tissue (which shows up breast conditions are denser than fat and also appear white on a mammogram).3 Mammographic densities reflect the tissue composition of the breast.4 Breasts that are denser may be harder to successfully screen for early signs of tumorigenesis, since the white of the fibrous tissue can mask an emerging cancer. Breast density is an important risk factor for breast cancer.5,6 Breast density on mammography, is determined relatively with measured breast fat and fibroglandular tissue and also in dense breast tissue breast cancer risk is increased 4-6 times more than in non-dense breast tissue.7,8 Radiologically dense tissue in the breast indicates stroma and epithelium, whereas lucent tissue indicates fat. Changes in the tissue composition of the breast occur with increasing age, and the amounts of stroma and epithelium decrease, whereas the amount of fat increases. These changes are reflected in a decrease in the prevalence of mammographic densities with increasing age.

Density in more than 50% of the breast could account for about a third of breast cancers. The epidemiology of mammographic density is consistent with its being a marker of susceptibility to breast cancer.

**Aims and objectives:**
To evaluate the Breast Density and Pattern of Presentation in Breast Cancer patients in Department of Surgery, IGMC, Shimla.

**MATERIAL AND METHODS**

**Study area:**
Present study was conducted in the Department of General Surgery and Radio diagnosis IGMC Shimla over a period of one year.
**Study period:**
From 1st July 2018 to 30 June 2019.

**Study Participants:**
Patients presenting with the symptoms of breast lump, breast pain, swelling and nipple discharge in the Department of Surgery were included in the present study.

**Sample size:**
A total of 30 with biopsy proven carcinoma of the breast were included and evaluated in the present study.

**Inclusion Criteria:**
Patients above 40 years with complaints of lump breast, breast pain, swelling, discharge from the nipple, or biopsy proven carcinoma of the breast were included in the present study.

**Exclusion Criteria:**
a) Patients less than 40 years.
b) Patients who had undergone Breast surgery for Benign or Malignant pathology.
c) Patients who have previously received Radio Therapy.

**Method of Data Collection**
Informed consent was taken from all the patients. In every case detailed history was taken and a thorough clinical examination was done. The following investigations were done in every case.
- Complete haemogram
- Renal Function Test
- Liver Function Test
- Chest X-ray
- Mammography

**Mammography:**
Bilateral Mammography was performed in all the patients of Group A and Group B over 40 yrs of age with standard planes of imaging i.e cranio-caudal (CC) and mediolateral oblique (MLO) view. All the mammograms were done with Fujifilm Mammographic Unit installed at IGMC Shimla by an experienced radiologist.

In cranio-caudal view the x-ray films were placed underneath the breast. The breast was held against the image receptor with compression. Mediolateral view was obtained with the x-rays film held between and parallel to the pectoralis major and latissimus dorsi muscles.

With comparative study of mammograms of the two breasts, the mammographic features were recorded.

Breast density was determined by using Breast Imaging-Reporting and Data System (BI-RADS).
- 0: Additional imaging or prior examinations
- 1: Negative
- 2: Benign
- 3: Probably Benign
- 4: Suspicious
- 5: Highly Suggestive of Malignancy
- 6: Biopsy proven

Breast density measured by BI-RADS was further classified into 4 Types:
- **Type A** (0%-25%): mostly fatty breast,
- **Type B** (25%-50%): fibroglandular breast,
- **Type C** (50%-75%): heterogeneously dense breast, and
- **Type D** (75%-100%): extremely dense breast on the basis of breast composition.

Patients were subjected as per BIRADS guidelines for FNAC/34

**Trucut Biopsy**
Biopsy/FNAC obtained in relevant cases was sent for histological examination where it was analyzed by a faculty member of Department of Pathology. The histo-pathological report was then subsequently obtained and duly noted.

**Statistical Analysis**
Results obtained were analyzed statistically. Data for the above mentioned result was compiled, tabulated, statistically analyzed using standard statistical methods. The relevance of result in the light statistical analysis was displayed and discussed.

**RESULTS & OBSERVATION:**
The present study was conducted in the Department of Surgery, IGMC, Shimla over one year period from 1st July 2018 to 30 June 2019. The present study comprised of 30 patients above 40 years with breast complaints after taking informed consents. Study included 30 patients with malignant lesion in the breast. In every case detailed history was taken and thorough clinical examination was done. Ultrasonography, Mammography and trucut biopsy/FNAC was carried out.

The age of the patients enrolled in the present study varied from 40 years to 80 years. The mean age of patients was 55.4±10.9 years. All patients in the present study were females. In our study, maximum 12 patients were in the age group of 40-50 years followed by 9 patients in age group of 51-60 years. (Table-1)(Figure-1).

<table>
<thead>
<tr>
<th>Age Groups (In Years)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-50</td>
<td>12</td>
</tr>
<tr>
<td>51-60</td>
<td>9</td>
</tr>
<tr>
<td>61-70</td>
<td>6</td>
</tr>
<tr>
<td>71-80</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total (No .Of Patients)</strong></td>
<td><strong>30</strong></td>
</tr>
</tbody>
</table>

**Table-1:** Age groups of the patients
Among all 30 patients, 28 patients complained of breast lump, 1 patient presented with nipple discharge and 1 patient was subjected for screening mammography. (Table-2). (Figure-2)

<table>
<thead>
<tr>
<th>Complaints</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast lump</td>
<td>28</td>
</tr>
<tr>
<td>Mastalgia (Breast Pain)</td>
<td>0</td>
</tr>
<tr>
<td>Screening Mammography</td>
<td>1</td>
</tr>
<tr>
<td>Others (Nipple discharge)</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
</tr>
</tbody>
</table>

Table -2: Presenting symptoms of patients

No significant family history was present in any patient.

Among all 30 cancer patients, 5 patients (16.7%) had breast density of Type A i.e. mostly fatty, while majority of patients i.e 21 patients (70%) had breast density of Type B i.e. scattered fibroglandular density and 4 patients (13.3%) had breast density of Type C i.e. consistently dense whereas no patient had Type D density. (Table-3)(Figure-3).
Among all 30 breast cancer patients, 10 patients (i.e. 33.3%) were BIRADS 4, 14 patients (46.7%) were BIRADS 5 and 6 patients (20%) were BIRADS 6. All of the 30 patients were subjected for Trucut Biopsy. (Table-4)(Figure-4)

<table>
<thead>
<tr>
<th>BIRADS</th>
<th>Number of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>10</td>
<td>33.3%</td>
</tr>
<tr>
<td>5</td>
<td>14</td>
<td>46.7%</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table-4: BIRADS in patients

Figure-3: Breast Density in patients

<table>
<thead>
<tr>
<th>Breast Density</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
<td>16.7%</td>
</tr>
<tr>
<td>B</td>
<td>21</td>
<td>70%</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>13.3%</td>
</tr>
<tr>
<td>D</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table-3: Breast Density in patients

Figure-4: BIRADS in patients

Among all 30 cancer patients, Trucut biopsy was done in all and 27 patients were diagnosed with duct cell carcinoma (90%) while 2 patient were reported as lobular carcinoma (6.7%) and 1 patients was diagnosed with tubular carcinoma (3.3%). (Table-5)(Figure-5)

<table>
<thead>
<tr>
<th>Number of Patients</th>
<th>Biopsy Result</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>Duct Cell carcinoma</td>
<td>90%</td>
</tr>
<tr>
<td>2</td>
<td>Lobular carcinoma</td>
<td>6.7%</td>
</tr>
<tr>
<td>1</td>
<td>Tubular carcinoma</td>
<td>3.3%</td>
</tr>
</tbody>
</table>

Table-5: Diagnosis of patients by FNAC
Breast density is a mammographic finding not related to the perceived density of breast tissue on palpation. It is possible to predict with considerable accuracy which women will develop breast cancer and equally important, those who are less likely to develop it based solely on the parenchymal pattern as seen by mammography. Information about breast density enhances the clinician’s appreciation of the sensitivity of the mammographic examination for an individual patient.

The age of the patients enrolled in the present study varied from 40 years to 80 years. The mean age of patients was 55.4 ± 10.9 years (ranging from 40 years to 80 years). Maximum patients in this study were in the age group of 40-60 years. In the study by Cheek et al. (2012) a total of 7007 patients were screened by mammography and the median age of their cohort was found to be 57 years which is comparable to our study. In that study 3867 (55.18%) patients belonged to age group between 40-60 with remaining patients being younger or older to this group. Thus the majority of patients presented in the same age group as detected in the present study.

In the present study, 28 patients complained of breast lump, 1 patient presented with nipple discharge and 1 patient was subjected for screening mammography. Thus 28 patients (93%) with malignant pathologies in breast had lump breast as presenting complaint and predominant complaint. In another study by Perry MC (2010) it was reported that majority of carcinoma breast (90%) present with lump breast. The results are similar to the present study in which 93% of patients with ca breast presented with lump breast.

In present study with 30 breast cancer patients, 10 patients (i.e. 33.3%) were BIRADS 4, 14 patients (46.7%) were BIRADS 5 and 6 patients (20%) were BIRADS 6 with all patients being subjected for Trucut Biopsy. Thus BIRADS rating was a strong predictor of presence of malignant pathology in breast as all 30 (100%) patients with BIRADS scoring of 4 and above had carcinoma on histopathological correlation. Mammography thus appears to be a highly sensitive modality in detect in pathologies of carcinoma breast even in the present scenario with advent of modern imaging techniques such as MRI and Ultrasound. In study by Li.T, Li. J, Dai.M et al. (2017), Women in their study predominately experienced scattered fibroglandular (37.64%) and heterogeneous MD (49.89%) and the result was comparable to those of the present study.

In present study of 30 cancer patients, 5 patients (16.7%) had breast density of Type A i.e. mostly fatty, while majority of patients i.e 21 patients (70%) had breast density of Type B i.e. scattered fibroglandular density and 4 patients (13.3%) had breast density of Type C i.e. consistently dense whereas no patient had Type D density (Table no. III). Thus the predominant appearance of breasts on mammogram was either fibroglandular (Type B) or consistently dense (Type C). Even though it is expected that the patients should report with higher breast density, however as a multitude of factors are involved in the causation of carcinoma breast and no single isolated factor can be completely responsible for the pathology it is difficult
to make generalizations on basis of a single result of a small sample size study. A large sample size randomized trial might provide more insight into the same.

In a study by Checka et al. (2012) there was a total of 558 women (8%) with Type A density (predominantly fatty) on mammography, 2570 (37%) with Type B (scattered fibroglandular elements) 3234 (46%) with Type C (heterogeneously dense), and 645 (9%) with Type D (extremely dense) showing predominance of Type B (68.3%) and C (20%) as already mentioned in the present study.

Limitations
The limitations of this study are as follows:
The existence of selection bias should be considered.
The study population was selected from single institute with small sample size and would not represent target population.

Although studies measured breast density as continuous variables, this study applied BI-RADS classification as categorical variable because BI-RADS classification is widely available in India and National Cancer Screening Program in India uses BI-RADS system to report the results.

CONCLUSION
The most common presenting complaint in breast cancer patients was breast lump. Most patients had higher BIRADS 5&6 and had breast density of Type B. Majority of the patients were reported as Duct Cell Carcinoma. Thus, Breast density should be an important consideration in designing an individualized screening protocol particularly for women with other risk factors for breast cancer.

REFERENCES
10. Walker HK, Hall WD, Hurst JW. Clinical methods: the history, physical, and laboratory examinations.