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Corresponding Author

Gangadhar L. Anmod,
Department of General Surgery,
GMC Nanded, India
ghanashyamingle600@gmail.com

Author Designation

¹Assistant Professor
^{2,5}Junior Resident
³Head of Unit
⁴Head of Department
⁶Professor and Head

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Study to Determine Positive Predictive Value of FNAC with Respect to the Post-Operative Histopathology Reports in Patients with Breast Carcinoma

¹Ghanashyam A. Ingle, ²Kaveri Shankar Palwe, ³Jayant S. Pednekar, ⁴Anuradha Panchal, ⁵Krishna Chaitanya and ⁶Gangadhar L. Anmod

¹Department of General Surgery GMC Alibag, India

^{2,5}Department of General Surgery, DY Patil, Nerul, Navi Mumbai, India

⁶Department of General Surgery, GMC Nanded, India

ABSTRACT

Breast cancer is the most common site-specific cancer in women and is the leading cause of death from cancer for women aged 20-59 years. Present study was aimed to study Positive Predictive Value of FNAC with respect to the Post-operative Histopathology Reports in patients with Breast Carcinoma. Present study was single-center, prospective, observational study, conducted in patients of age between 20-90 years, both genders, with breast lumps and FNAC positive reports, who belong to clinical Stage I, Stage II and Stage III disease. The data used in the study was obtained from 50 cases that were evaluated. Mean Age was 49.66±14.53 years. It was seen in the study that majority of patients had menarche between 12-13 years (48%). Mean Age of menarche was 11.98±1.26 years. Pain/ Discomfort was noted in 44% of the patients. 38% of cases had lump size of <3cm². 64% of the patients had the lump in the upper and outer quadrant. 76% of the cases did not have any fixity to the skin or underlying structures. Nipple retraction was noted in 48% of the cases while nipple discharge was noted in only 32% of the cases studied. 68% of the cases presented with positive axillary lymph nodes. Only in 30% of the cases, Peau-d-orange appearance of the skin was noted. About 60% showed infiltrating ductal carcinoma on FNAC, while 38% FNAC were suggestive of malignancy in the present study. The present study shows that FNAC could pick up only 60.5% of Infiltrating Ductal Carcinomas and could not give results for Infiltrating Lobular Carcinoma or Medullary Carcinomas. FNAC was highly effective in diagnosing malignancy and was highly sensitive.

INTRODUCTION

Breast cancer is the most common site-specific cancer in women and is the leading cause of death from cancer for women aged 20-59 years. It accounts for 26% of all newly diagnosed cancers in females and is responsible for 15% of the cancer-related deaths in women^[1]. Breast cancer is a disease of the old age with the peak incidence in the fifth and sixth decades, but in India the disease is seen a decade earlier, probably because of shorter life expectancy in Indian women (about 65.3 years as per Indian data in 2005) as compared to counterparts in USA^[2]. It is most often observed that due to lack of knowledge and ignorance, patients of carcinoma breast clinically present in a late stage of the disease. The management of breast cancer requires a complex multi disciplinary approach involving surgeons, radiotherapists, medical oncologists and pathologists^[3]. In UK, suspected cases receive triple assessment which consists of history and examination, diagnostic imaging by mammography or ultrasonography and Cytology or histology. Sensitivity ranges from 85-95%^[4]. Present study was aimed to study Positive Predictive Value of FNAC with respect to the Post-operative Histopathology Reports in patients with Breast Carcinoma.

MATERIALS AND METHODS

Present study was prospective, observational study, conducted in department of general surgery, at Department of General Surgery, GMC Nanded, India. Study duration was of 2 years (October 2019 to September 2021). Study was approved by institutional ethical committee.

Inclusion Criteria:

- Age between 20-90 years, both genders, with breast lumps and FNAC positive reports, who belong to clinical Stage I, Stage II and Stage III disease.

Exclusion Criteria:

- Pregnant women.
- Patients with benign breast diseases.
- Excludes all inoperable advanced breast malignancies.
- Patients with inflammatory breast carcinomas.
- Recurrent breast lump in a previously operated case of carcinoma breast.

Clinical details were noted in proforma. Routine investigations as CBC with Hb, Total Leukocyte count, Differential WBC count, Erythrocyte sedimentation rate, Platelet count, Bleeding time, blood sugar (Fasting BSL, post prandial BSL), RFT (Sr. urea, sr. Creatine, Blood urea nitrogen) and Serum creatinine

were done in all patients. Specific investigations were done whenever required such as Fine needle aspiration cytology, Ultrasound breast/Mammography-same or opposite breast, Post Operative Histopathology Report, Chest X ray PA view, Ultrasound Abdomen and Pelvis, Liver function tests, Electrocardiogram, Alkaline Phosphatase levels, etc. Almost all the patients were operated under general anesthesia, placed in supine position on the OT table with arm extended and a sandbag placed beneath the shoulders. A transverse elliptical incision which was about 5cm away from the lesion and which included the nipple was marked with a marker. In few cases an oblique elliptical incision was used. Medial limit was up to lateral border of sternum and laterally it extended up to anterior axillary fold. Identification of the lateral border of the pectoralis major was done and the axillary tail and axillary contents were cleared along this border. Latissimus dorsi was identified and axillary contents were cleared from its anterior border. Axillary clearance was then performed, a satisfactory result was achieved by preserving the pectoralis minor muscle and dissecting up to the Level II lymph nodes. Negative suction drainage with 14Fr Romovac suction drain was used in majority of cases. One was placed in axilla and one beneath the lower flap but both were brought out from the lower flap. Patients received antibiotics and analgesics in the post-operative period. Patients were then started on chemotherapy with respect to the stage of the disease. Follow up of patients was done on OPD basis and readmission for any post-operative complications. Statistical analysis was done using descriptive statistics. Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version.

RESULTS AND DISCUSSIONS

The data used in the study was obtained from 50 cases that were evaluated. In the study majority of cases belonged to age group of 41-50 years (34%) followed by 31-40 age group (20%). Mean Age was 49.66±14.53 years. It was seen in the study that majority of patients had menarche between 12-13 years (48%). Mean Age of menarche was 11.98±1.26 years. In the present series none were nulliparous, majority had their first childbirth before 20 years (64%), mean Age of first childbirth was 20.64±3.03 years. In the study, none were nulliparous, 3 children were the most common (40%). In the study all the patients had breast fed their babies. In the present study, 30% had positive Family history for breast cancer. In the present study 46% were pre-menopausal women while 54% were post-menopausal.

Table 1: General Characteristics

Characteristics	No. of subjects	Percentage
Age group (in years)		
21-30	5	10.0
31-40	10	20.0
41-50	17	34.0
51-60	8	16.0
61-70	6	12.0
71-80	4	8.0
Mean Age (in years)	49.66 ±14.53	
Age in years		
10-11	20	40.0
12-13	24	48.0
14-15	6	12.0
Age at first birth		
17-20	32	64.0
21-25	14	28.0
26-30	4	8.0
Parity		
Parity 1	-	-
Parity 2	13	26.0
Parity 3	20	40.0
Parity 4	6	12.0
Other		
Breast feeding	50	100.0
Family history	15	30.0
Menopausal Status		
Pre	23	46.0
Post	27	54.0

In the study, Pain/ Discomfort was noted in 44% of the patients. Equal incidence of cancer was noted in both the right and left breasts. 38% of cases had lump size of <3cm. 64 % of the patients had the lump in the upper and outer quadrant. 76% of the cases did not have any fixity to the skin or underlying structures.

Table 2: Characteristics of the Breast Lump in the Patients Studied

Breast Lump	Number of patients (n=50)	Percentage
Pain / Discomfort		
Absent	28	56.0
Present	22	44.0
Side		
Left	25	50.0
Right	25	50.0
Quadrant		
C	6	12.0
LI	5	10.0
LO	1	2.0
UI	6	12.0
UO	32	64.0
Fixity		
Nil	38	76.0
Present	12	24.0

In the present study, nipple retraction was noted in 48% of the cases while nipple discharge was noted in only 32% of the cases studied.

Table 3: Characteristics of Nipple in the Patients Studied

Nipple	Number of patients (n=50)	Percentage in the study	Tyagi et.al study84 Percentage
Retraction			
· Absent	26	52.0	89.2
· Present	24	48.0	10.8
Discharge			
· Absent	34	68.0	89.2
· Present	16	32.0	10.8

In the present study 68% of the cases presented with positive axillary lymph nodes.

Table 4: Distribution of Axillary Lymph Nodes of the Patients Studied

Axillary LNs	Number of patients	Percentage
Absent	16	32.0
Present	34	68.0

In the present study, only in 30% of the cases, Peau-d-orange appearance of the skin was noted

Table 5: Distribution of Peau-d-Orange Appearance in the Patients Studied

Peau-d- orange	Number of patients	Percentage
Absent	35	70.0
Present	15	30.0

In the present study, 34Percentage of cases showed a T2 stage followed by 28Percentage of cases with T1 stage and 24Percentage with T3 stage. 62Percentage of cases showed N2 status followed by 32Percentage with N0 status. About 50Percentage of the cases were Stage III on presentation while 42Percentage showed a Stage II disease.

Table 6: Distribution of TNM Staging of Patients Studies

TNM staging	Number of patients (n=50)	Percentage
Tumour		
· T0	7	14.0
· T1	14	28.0
· T2	17	34.0
· T3	12	24.0
Nodal status		
· N0	16	32.0
· N1	31	62.0
· N2	3	6.0
Stage of disease		
· Stage I	4	8.0
· Stage II	21	42.0
· Stage III	25	50.0

About 60% showed infiltrating ductal carcinoma on FNAC, while 38% FNAC were suggestive of malignancy in the present study.

Table 7: Distribution of FNAC Findings of Patients Studied

FNAC	Number of patients	Percentage
Infiltrating ductal carcinoma (IDC)	31	62.0
Suggestive of malignancy	19	38.0

The present study revealed 86% of cases to be Infiltrating Ductal Carcinoma while only 4% with Infiltrating Lobular Carcinoma and 10% with Medullary Carcinoma.

Table 8: Distribution of Histopathology Reports of the Patients Studied

Histopathology	Number of patients	Percentage
IDC	43	86.0
ILC	2	4.0
MC	5	10.0
Others	0	0.0
Total	50	100.0

In the present study it was noted that 50% of Stage I disease was noted between 51-60 years of age, while 52.4% of Stage II disease noted between 41-50 years of age and 40% of Stage III noted beyond 60 years of age, thus showing that with increase in age, there is an increase in the Stage of the disease.

Table 9: Correlation of Stage of Disease and Age in Years of Patients Studied

A Age of in years	Stage of Disease			P-value
	Stage I (n=4)	Stage II (n=21)	Stage III (n=25)	
<40	1 (25.0 %)	8 (38.1 %)	6 (24.0 %)	0.002**
41-50	1 (25.0 %)	11(52.4 %)	5 (20.0 %)	
51-60	2 (50.0 %)	2 (9.5 %)	4 (16.0 %)	
>60	0	0	10 (40.0 %)	

The present study shows that FNAC could pick up only 60.5% of Infiltrating Ductal Carcinomas and could not give results for Infiltrating Lobular Carcinoma or Medullary Carcinomas. ER/PR status had no correlation with the histopathology outcome. But Her 2 neu status, in Infiltrating ductal carcinomas was negative in 97.7% of cases, negative in all cases of Infiltrating lobular carcinomas but positive in 40% cases of detected Medullary Carcinomas.

As age increases incidence of breast cancer increases with age in India breast cancer was found more prevalent in between age of 5th and 6th decade. In this study incidence of breast cancer is 34 % between 41-50 years age cancer is more prevalent in 4th and 5th decade age group. Breast cancer risk increases with early menarche in this study 88% patient had menarche between 10-13 years of age after 12 years of age relative risk of breast cancer decreases 7% for each year women having menarche at 10-11 years have 2.2 times risk of breast cancer as compared to those having menarche at 12 years age according to Peters^[5]. Risk of breast cancer decreases if the first birth is as early as possible women with first full term pregnancy young than 30 years with more than three full term pregnancy having breast fed more than 3 years have significant protective effect against breast cancer. In this study, 64 % of people had their first birth during 17-20 years of age. MacMohan^[6] series suggested equal incidence in all age groups. Thus, showing that although they had a younger age during their first birth, the incidence of breast cancer remained the same in the study. Mukherjee^[7] suggested that except for parity, no other reproductive factor plays any role in the incidence of breast cancer. In our study, it was noted that 46% were in the pre-menopausal age group and 54% in the post-menopausal age group. In other studies, Raina^[8] had 49.7% of patients in the pre-menopausal age group while the rest was post-menopausal. In this study, an apparent higher incidence is noted of cases in the post- menopausal age group.

Pain/Discomfort: Pain and discomfort are usually not seen in early breast malignancies as they are usually painless lumps. They are usually seen with involvement of skin or chest wall or due to infiltration of nerves. Pain and discomfort were noted in about 44% of the population while breast lump was seen in 100% of the

cases. Tyagi^[9] suggested 33.5% of cases presented with pain/discomfort while 12% was suggested by Ackerman Del Regato^[10]. Marshall^[11] suggested that 60% of their cases had the tumour in the upper outer quadrant while Sen and Dasgupta^[6] had 49% Percentage of the cases in the same quadrant. About 64% Percentage of the cases in our study had the tumour in the upper outer quadrant, showing preponderance of breast cancer for the upper outer quadrant of the breast. Tyagi^[9] suggested only 10.8 % of their cases had nipple retraction while in our study 48% of the patients had nipple retraction. Tyagi^[9] suggested 10.8% of their cases had nipple discharge. Studies suggest that nipple discharge is present in 3-11% Percentage of the cases. 50% of Stage I disease was noted between 51-60 years of age, while 52.4% of Stage II disease noted between 41-50 years of age and 40% of Stage III noted beyond 60 years of age, thus showing that with increase in age, in the given study it means that there is an increase in the Stage of the disease. 50% of Stage I disease, 85.8% Percentage of Stage II disease and 96% of Stage III disease had menarche between 10-13 years of age thus indicating that an earlier age of menarche predisposes to higher chances of breast cancer in the patients. This present study shows that FNAC could confirm only 60.5% of Infiltrating Ductal Carcinomas and could not give positive results for Infiltrating Lobular Carcinoma or Medullary Carcinomas. ER/PR status had no correlation with the histopathology outcome. But Her 2 neu status, in Infiltrating ductal carcinomas was negative in 97.7% of cases, negative in all cases of Infiltrating lobular carcinomas but positive in 40% cases of detected Medullary Carcinomas.

CONCLUSION

Higher cases were noted with Stage II and Stage III disease reflecting the poor education and negligence on the part of the patients. FNAC was highly effective in diagnosing malignancy and was highly sensitive. Histopathology revealed highest incidence of infiltrating ductal carcinoma in the study. Increase in age resulted in increase in the stage of disease on presentation.

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