

Research Article



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INFLUENCE OF QUADRANT PLACEMENT ON BREAST LUMP PROGNOSIS: A CYTOMORPHOLOGICAL APPROACH

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ABSTRACT

Background: Research on the quadrant location's significance in predicting the prognosis of breast lesions has been ongoing for a while, but no conclusive findings have been published.

The objectives are to determine the incidence of breast lesions in each quadrant, the significance of each quadrant location for the prognosis of breast lumps, and the type of the breast lumps by cytomorphological examination.

Techniques: After a quadrant location evaluation, a thorough physical, radiographic, and clinical examination was conducted. An examination of the axilla, bilateral nipples, and lymph nodes was performed on each research participant. After staining, FNAC was performed for cytomorphologic analysis.

Fibroadenoma and IDCC were most common in the lateral upper quadrant, occurring in 58.62% (n = 34) and 70% (n = 14) of cases, respectively. The medial upper quadrant of IDCC was seen in 30% (n=6) of the individuals. 10.34% (n=6) of the individuals in the lateral lower quadrant, 13.79% (n=8) of the participants in the medial upper quadrant, 10.34% (n=6) of the subjects in the central region, and 6.89% (n=4) of the subjects in the medial lower quadrant all had fibroadenoma.

In conclusion, the most prevalent benign and malignant lesions are fibroadenoma and invasive ductal cell carcinoma. These lesions are more frequently seen in the lateral outer quadrant, with the upper lateral quadrant showing a better prognosis.

Key Words: Breast Lump, cytomorphological study, Fibroadenoma, Invasive duct cell carcinoma, Prognosis, quadrant location.

INTRODUCTION

The glandular organ that is the breast is affected by several tumours and lesions in the breast, which are mostly caused by female hormones. The lesions impact different age groups and range widely in severity. These blemishes may be benign, cancerous, or inflammatory. Pain and the development of a lump are the most typical signs of a breast lesion. Breast cancer is the most prevalent cancer in women worldwide to be recorded, and its prevalence is rising everywhere, including in India.¹

In India alone, there are almost 100,000 new instances of breast cancer detected annually. It was often believed that Indian women of high socioeconomic status were the only ones affected by breast cancer. This idea has lately evolved, nevertheless, as the prevalence of breast cancer in rural areas has grown.

According to data from the Indian Council of Medical Research-Population Based Cancer Registry of India (ICMR-PBCR), around 30% of women living in the nation's urban regions would get breast cancer.²

In 50–70% of afflicted people, reported cases of breast cancer in Indian females are often detected in advanced stages. A 5-year survival rate has been reported by several studies in fewer than 20% of females with untreated breast cancer. Thus,

lowering death and morbidity in breast cancer patients requires early diagnosis, screening, and detection. The current study also examined the quadrant placement in breast cancer patients with respect to the prognosis of breast lesions, which is evaluated over a number of years. According to SEER (Surveillance Epidemiology End Results) coding criteria, quadrant placement is important for malignant lesions.³

The importance of tumour site in breast lesions remains unclear despite much investigation. There are variations in lymphatic drainage for every quadrant site. As a result, using the axillary node absence positive to distinguish between low-risk and high-risk lesions may lead to incorrect classification. The estimated risk ranges from around 3% to 17% for benign tumours to turn malignant.⁴ The current study employed fine needle aspiration cytology, or FNAC, as a diagnostic method and concentrated on the risk range while also taking the location of the breast lesion into account.

MATERIALS AND METHODS

The purpose of this study was to determine the incidence of breast lesions in each quadrant, the significance of different quadrant placements in terms of breast lump prognosis, and the form of the breast lump by cytomorphological examination. The Department of General Surgery and Pathology conducted the study.

Subjects who reported having a breast lesion, or breast lump (Figure 1), as well as those who were willing to engage in the study, were the study's inclusion criteria. Subjects with secondaries in the breast, history of past breast lesion, history of prior breast therapy, and incapacity to provide permission were the exclusion criteria for this study. All subjects gave their written and verbal informed permission after being fully told about the study's concept.

A comprehensive clinical history was obtained; a physical examination, radiographic imaging, and assessment of the quadrant location of the breast lesion were performed on 146 female participants in the study. The breast lesion was measured vertically and horizontally (Figures 2 and 3), and the lymph nodes, axilla, and nipple were bilaterally examined. For each of the breast lesions, FNAC was performed using a 22-gauge needle. After doing the Giemsa and hematoxylin and eosin staining, an evaluation was conducted.

Chicago Inc., USA's SPSS version 20 was used to statistically evaluate the gathered data. The data were presented as a mean, standard deviation, percentage, and number. The level of significance was kept at $p < 0.05$. The tests used were Chi-square, student t-test, and ANOVA.

RESULTS

The current cytomorphologic study was conducted to determine the type of the breast lump using cytomorphological analysis, as well as the prevalence of breast lesions in each quadrant and their significance in breast lump prognosis. There were 146 people in the research, both male and female. Table 1 contains a list of the research individuals' demographic details. The research participants' average age was 38.4 ± 6.28 years. The majority of research participants (32.87%; $n = 48$) were between the ages of 21 and 30. Others (19.17%; $n = 28$) were between the ages of 31 and 40, 16.43% ($n = 24$) were between the ages of 41 and 50, and 15.06% ($n = 22$) were between the ages of 51 and 60.

The lateral upper quadrant accounted for 46.57% ($n=68$) of the lesions, with 26.02% ($n=38$) in the medial upper quadrant, 12.32% ($n=18$) in the middle area, 10.95% ($n=16$) in the lateral lower quadrant, and 4.10% ($n=6$) in the medial lower quadrant (Table 1).

Based on an analysis of the distribution of malignant lesions in the research participants, invasive duct cell carcinoma was the most prevalent kind, occurring in 13.69% ($n=20$) of the subjects, followed by lobular carcinoma in 2.73% ($n=4$), medullary carcinoma in 1.36% ($n=2$) of the subjects, and metastatic carcinoma in 1.36% of the subjects. Fibroadenoma was the most frequent benign lesion among the patients ($n=58$) in the research, with gynecomastia coming in second with 12.32% of the subjects, fibrocystic disease with 9.58% of the subjects, and proliferative breast disease (PBD) with atypia with 5.47% of the subjects. As indicated by Table 2, the most prevalent non-neoplastic lesions among the research participants were chronic non-specific lesions, which affected 4.10% ($n = 6$). Granulomatous lesions and lipoma affected 1.36% ($n = 2$) of the participants each.

Among the research participants, fibroadenoma and invasive duct cell carcinoma were the most common benign and malignant tumours. Both fibroadenoma and IDCC were most prevalent in the lateral upper quadrant, with 58.62% ($n=34$) and 70% ($n=14$) of individuals, respectively, according to an analysis of their quadrant-wise distribution. The medial upper quadrant of IDCC was seen in 30% ($n=6$) of the individuals. 10.34% ($n=6$) participants in the lateral lower quadrant, 13.79% ($n=8$) respondents in the medial upper quadrant, and 10.34% ($n=6$) subjects in the centre quadrant had fibroadenoma, and in 6.89% ($n=4$) subjects in the medial lower quadrant as depicted in Table 3.

The FNAC samples in the research patients were evaluated for histologic grading, staging, and coding. For the Nottingham histologic scores of 3-5, the BR grade was low, the nuclear grade was 1/3, 1/2, and it was well-differentiated. The histologic grade was 1/3, I/III, I, and the SEER code was 1. The BR grade was intermediate, the nuclear grade was 2/3, it was moderately differentiated, the histologic grade was 2/3, and the SEER code was 2 for Nottingham's histologic scores of 6,7. The nuclear grade in Nottingham was 2/3, poorly differentiated, the histologic grade was 3/3, III/III, III, and

the SEER code was 3. The histologic scores were 8,9, and the BR grade was high. As indicated in Table 4, the lesion was undifferentiated or aplastic with a histologic grade of 4/4, IV/IV, IV, and a SEER code of 4, and the BR grade was high with a nuclear grade of 4/4 for the score of 8,9.

DISCUSSION

The current cytomorphologic study was conducted to determine the type of the breast lump using cytomorphological analysis, as well as the prevalence of breast lesions in each quadrant and their significance in breast lump prognosis. There were 146 people in the research, both male and female. Table 1 contains a list of the research individuals' demographic details. The research participants' average age was 38.4 ± 6.28 years. The majority of research participants (32.87%; $n = 48$) were between the ages of 21 and 30. Others (19.17%; $n = 28$) were between the ages of 31 and 40, 16.43% ($n = 24$) were between the ages of 20 and 50, and 15.06% ($n = 22$) were between the ages of 41 and 50. With 46.57% ($n=68$) of the participants having lesions in the lateral upper quadrant, the majority of the lesions were in the medial upper quadrant (26.02%; $n=38$), 12.32% ($n=18$) in the central area, 10.95% ($n=16$) in the lateral lower quadrant, and 4.10% ($n=6$) in the medial lower quadrant. The research participants' demographic and illness features were similar to those evaluated by the authors of studies by Darbre PD et al. (2005) and Sohn VY et al. (2008), whereby the subjects shared similar characteristics.

Invasive duct cell carcinoma was the most common malignant lesion among the study subjects, accounting for 13.69% ($n=20$) of the total, followed by lobar carcinoma (2.73%) ($n=4$), medullary carcinoma (1.36%) ($n=2$), and metastatic carcinoma (1.36%) of the subjects. Fibroadenoma was the most frequent benign lesion among the patients ($n=58$) in the research, with gynecomastia coming in second with 12.32% of the subjects, fibrocystic disease with 9.58% of the subjects, and proliferative breast disease (PBD) with atypia with 5.47% of the subjects. Within the non-neoplastic lesions, chronic non-specific lesions accounted for 4.10% ($n = 6$) of the research participants, while granulomatous lesions and lipoma accounted for 1.36% ($n = 2$) of the patients each.

These findings aligned with research by Wu S et al. (2014) and Selvakumaran S et al. (2017), whose participants had comparable lesion distributions to those of the current study.

Among the research participants, fibroadenoma and invasive duct cell carcinoma were the most common benign and malignant tumours. Both fibroadenoma and IDCC were most prevalent in the lateral upper quadrant, with 58.62% ($n=34$) and 70% ($n=14$) of individuals, respectively, according to an analysis of their quadrant-wise distribution. The medial upper quadrant of IDCC was seen in 30% ($n=6$) of the individuals. 10.34% ($n=6$) of the individuals in the lateral lower quadrant, 13.79% ($n=8$) of the participants in the medial upper quadrant, 10.34% ($n=6$) of the subjects in the central region, and 6.89% ($n=4$) of the subjects in the medial lower quadrant all had fibroadenoma. The findings aligned with the research conducted by Singh SK et al. (2016) and Goyal V et al. (2005), which indicated that the lateral upper quadrant was the most often affected quadrant.

In order to assess the histologic grading, staging, and coding of the FNAC samples in the study participants, the nuclear grade was 1/3,1/2, well-differentiated, the histologic grade was 1/3, I/III, I, and the SEER code was 1 for Nottingham histologic scores of 3-5. The BR grade was intermediate, the nuclear grade was 2/3, it was moderately differentiated, the histologic grade was 2/3, and the SEER code was 2 for Nottingham's histologic scores of 6,7.

The nuclear grade in Nottingham was 2/3, poorly differentiated, the histologic grade was 3/3, III/III, III, and the SEER code was 3. The histologic scores were 8,9, and the BR grade was high. Additionally, the lesion was undifferentiated or aplastic with a histologic grade of 4/4, IV/IV, IV, and a SEER code of 4, and the BR grade was high with a nuclear grade of 4/4 for the score of 8,9. These findings were comparable to those of investigations conducted in 2013 by Chandawale S et al. and in 2011 by Prakash HM et al., where the authors reported similar histologic findings to those of the current research.

CONCLUSION

According to the current study, fibroadenoma and invasive ductal cell carcinoma are the most prevalent benign and malignant lesions, with the upper lateral quadrant showing a better prognosis and having a higher frequency of occurrence in the lateral outer quadrant. Nevertheless, there were several drawbacks to the current study, such as biases related to geographic location, short monitoring periods, and small sample sizes. Therefore, further long-term research with bigger sample sizes and longer observation periods will aid in coming to a conclusive result.

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TABLES

Characteristics	Percentage (%)	Number (n)
Mean age (years)	38.4±6.28	
Age range (years)		
<20	16.43	24
21-30	32.87	48
31-40	19.17	28
41-50	15.06	22
51-60	5.47	8
61-70	5.47	8
71-80	1.36	2
>80	4.10	6
Lesion location (quadrant)		
Lateral upper	46.57	68
Lateral lower	10.95	16
Medial upper	26.02	38
Medial lower	4.10	6
Central	12.32	18

Table 1: Demographic characteristics of the study subjects

Lesion distribution	Subgroup	Percentage (%)	Number (n)
Malignant	Metaplastic carcinoma	1.36	2
	Medullary carcinoma	1.36	2
	Lobar carcinoma	2.73	4
	Invasive duct cell carcinoma	13.69	20
Benign	Atypical ductal hyperplasia	1.36	2
	Adenosis	2.73	4
	Phyllodes	2.73	4
	PBD with atypia	5.47	8
	Fibrocystic disease	9.58	14
	Gynecomastia	12.32	18
	Fibroadenoma	39.72	58
Non-neoplastic	Lipoma	1.36	2

	Granulomatous	1.36	2
	Chronic non-specific	4.10	6

Table 2: Lesion distribution in the study subjects

Quadrant	Fibroadenoma		Invasive duct cell carcinoma (IDCC)	
	%	n=58	%	n=20
Lateral upper	58.62	34	70	14
Lateral lower	10.34	6	0	0
Medial upper	13.79	8	30	6
Medial lower	6.89	4	0	0
Central	10.34	6	0	0

Table 3: Distribution of most common benign and malignant Lesion in different quadrants

Nottingham histologic scores	BR grade	Nuclear grade	Term	Histologic grade	SEER code
3-5	Low	1/3,1/2	Well-differentiated	1/3, I/III, I	1
6,7	Intermediate	2/3	Moderately differentiated	2/3, II/III, II	2
8,9	High	2/2, 3/3	Poorly differentiated	3/3, III/III, III	3
		4/4	Aplastic/undifferentiated	4/4, IV/IV, IV	4

Table 4: Histologic staging and grading in a different quadrant