Original Research Article

Does The Quadrant of Location Change The Prognosis of A Breast Lump? A Cytomorphological Study

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Abstract

Introduction: Tumour location within the breast varies with the highest frequency in the upper outer quadrant (UOQ) and lowest frequency in the lower inner quadrant (LIQ). Whether tumour location is prognostic is unclear. To determine whether tumour location is prognostic, associations between tumour site and clinicopathological characteristics were evaluated. Materials and Methods: All patients enrolled in the Clinical Breast Care Project whose tumour site—UOQ, upper inner quadrant (UIQ), central, LIQ, lower outer quadrant (LOQ)—was determined by a single, dedicated breast pathologist were included in this study. Patients with multicentric disease (n = 73) or tumours spanning multiple quadrants were excluded from further analysis. Clinicopathological characteristics were analysed using chi-square tests for univariate analysis with multivariate analysis performed using principal components analysis (PCA) and multiple logistic regression. Significance was defined as P < 0.05. Results: Of the patients with defined tumour location, 30 had bilateral disease. Tumour location in the UOQ (51.5%) was significantly higher than in the UIQ (15.6%), LOQ (14.2%), central (10.6%), or LIQ (8.1%). Tumours in the central quadrant were significantly more likely to have higher tumour stage (P = 0.003) and size (P < 0.001), metastatic lymph nodes (P < 0.001), and mortality (P = 0.011). After multivariate analysis, only tumour size and lymph node status remained significantly associated with survival. Conclusions: Evaluation of tumour location as a prognostic factor revealed that although tumours in the central region are associated with less favourable outcome, these associations are not independent of location but rather driven by larger tumour size. Tumours in the central region are more difficult to detect mammographically, resulting in larger tumour size at diagnosis and thus less favorable prognosis. Together, these data demonstrate that tumour location is not an independent prognostic factor.
Keywords: Brest Quadrants, Tumor Location, Prognosis.

INTRODUCTION

Importance of quadrant location on prognosis of breast lesions has been investigated for manyyears. Quadrant location for malignancy has been given importance in (Surveillance Epidemiology End Results) SEER Coding guidelines. However prognostic significance of tumor location in breast cancer remains unclear.

Lymphatic drainage is different for each breast quadrant; therefore, absence of axillary node positivity could misclassify high-risk lesion to low risk., Calculated risk for malignant transformation of benign lesions ranges from 3%-17% [1, 2].

Fine needle aspiration cytology (FNAC) is widely accepted as a reliable technique in the initial evaluation of palpable and non-palpable (guided biopsy) breast lumps. The procedure is simple, safe, cost effective, minimally invasive, rapid, and as sensitive as biopsy [3].

The primary goal of FNAC is to separate malignant lesions that require more radical therapy from benign ones that may be conservatively managed. The scope of cytology now extends into identifying the subtypes of malignant lesions, benign lesions, and minimal residual disease for the purpose of planning the therapeutic protocol and eventual follow-up. Thus, it plays a major role as an important preoperative assessment along with clinical and mammography examination, which together are frequently referred to as ―Triple test‖ [4, 5].

Pattern is identification of quality. It is known that despite the many sites and many types of tumors that are aspirated, there are a limited number of patterns based on morphology observed in aspirated material. However, the frequency, significance, and difference of each pattern vary with the site.

Many authors have used various methods to come to a conclusive method of diagnosis on breast lesions. Here, we propose a partially modified method based on systematic pattern analysis to analyze the breast lesions and divide them into individual categories.

Our study focuses on this range of risk by additional consideration of breast quadrant utilizing fine needle aspiration cytology (FNAC) as a diagnostic.

AIMS AND OBJECTIVES
- To assess the prevalence of breast lesions in various quadrant.
- To assess quadrant of location as a risk factor for breast lesions.

- To correlate cytomorphological features of FNAC of spectrum of lesions encountered

With importance of quadrant of location determines the prognosis of the breast lump.

MATERIALS AND METHODS
One-year prospective study done at Kamineni Institute of Medical Sciences (KIMS) Narketpally, Avalon University of Medicine, Curacao (AUSOM), Obstetrics & Gynecology, Endoscopy & Laser Surgery, Curacao, between June 2017 to July 2018 with 73 cases of breast lump.

Clinical history, radiological imaging and physical examination was done noting quadrant of location along with bilateral examination of nipple, axilla & lymph nodes.

FNAC was done with 22-gauge needle. Cytomorphology evaluation carried out on Hematoxylin and Eosin and Giemsa-stained smears. Statistics was compiled and p value calculated using SPSS software.

Fine needle aspiration was done with a 21- or 22-gauge needle attached to a 10-cc disposable syringe mounted on a syringe holder for single handgrip. The specimen was taken with minimum passes (to minimize hemorrhage) without needle withdrawal and under constant negative.

RESULT
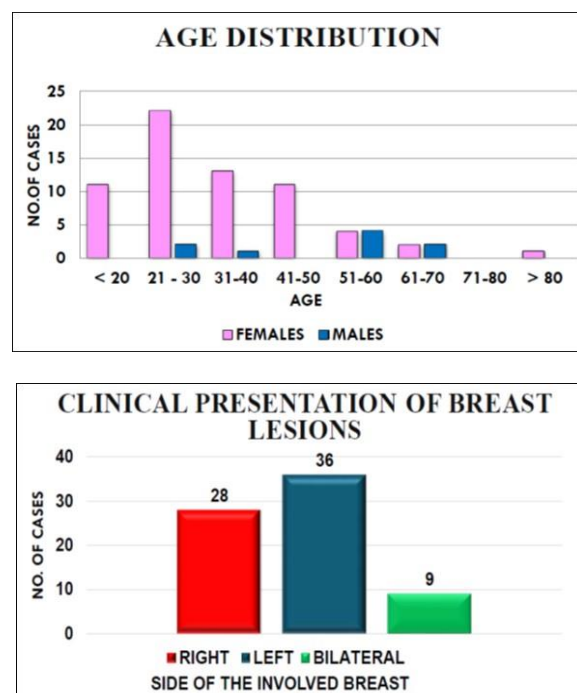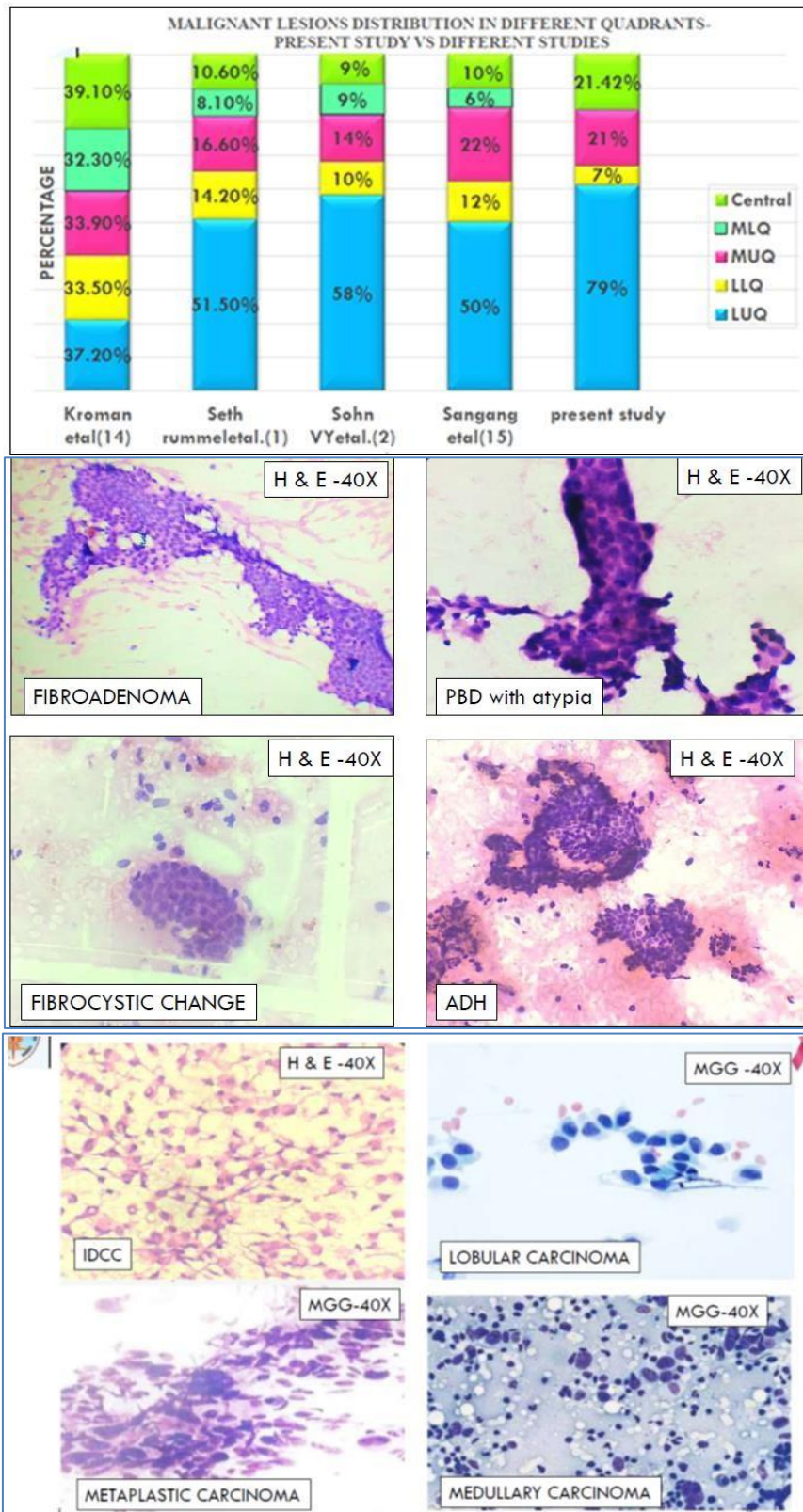
According to studies conducted by Seth Rummel *et al.,* [10] tumors occurring in lateral upper quadrant carries better prognosis than those occurring in other quadrants. Calculated risk for fibroadenoma is 3%.

Quadrant wise location of IDCC in both Breasts. The most common location of IDCC in our study was lateral upper quadrant.
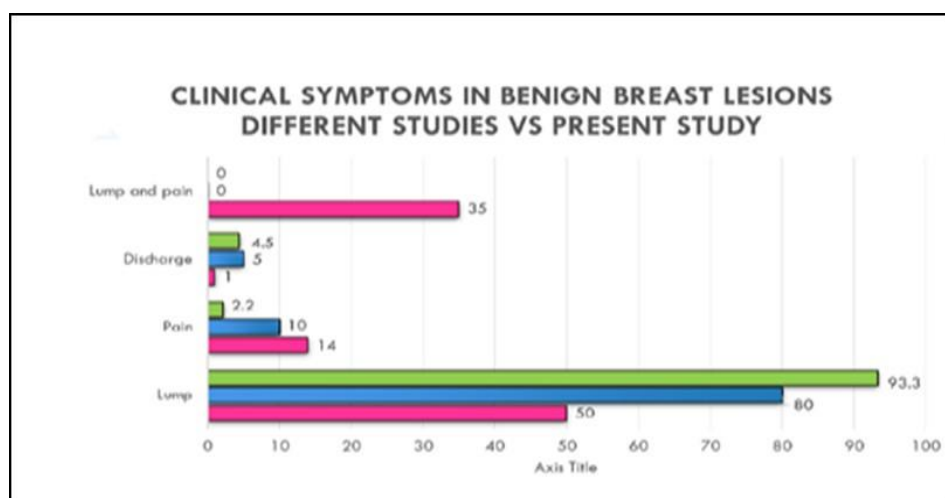
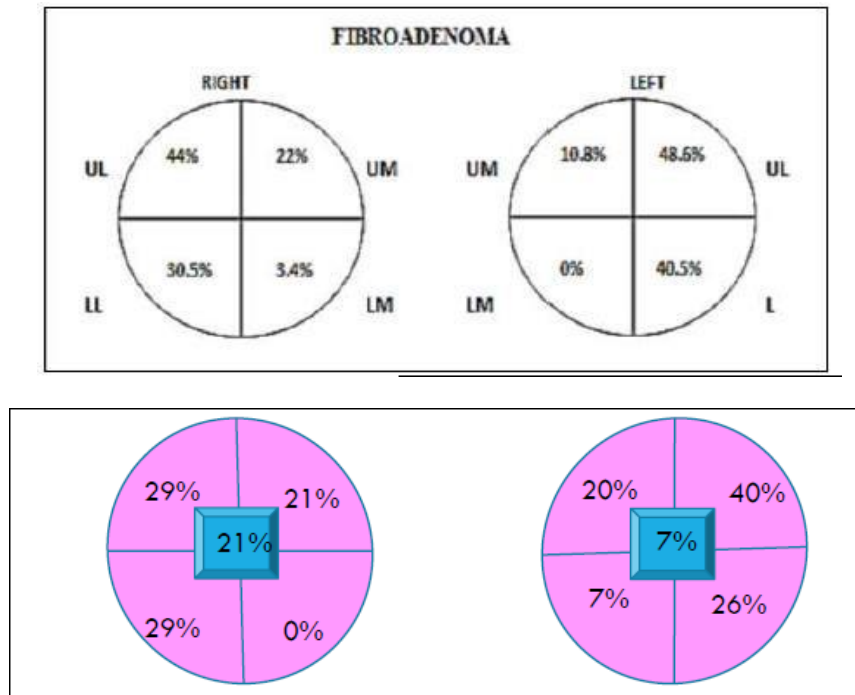| RISK FACTORS		LUQ	MUQ
Age at diagnosis	<40 yrs	1	1
	40-49 yrs	4	1
	50 yrs	6	1
Menopausal status	Pre-Menopausal	3	1
	Post-Menopausal	8	2
Breast feed	Yes	9	2
	No	2	1
Tumor size	<2 Cm	0	0
	2-5 Cm	10	3
LN Status	Positive	1	0
	Negitive	10	3

The most common location of IDCC in our study was lateral upper quadrant.

DISCUSSION

Determination of whether tumour location can be used prognostically is important in optimizing treatment. Tumour location is highest in the UOQ (50–58%) across multiple populations, including Chinese, Danish, the United Kingdom, and women treated within the United States Department of Defence healthcare system. Two studies suggest that the frequency of tumours in the UOQ has increased over time [6, 7]; given the association of tumour in the UOQ with improved prognosis, these data would suggest a trend towards a reduction in breast cancer mortality. Tumour occurrence in the LIQ, however, has also increased significantly and tumour location in the LIQ has been associated with >2-fold increase in mortality, suggesting that the decrease in mortality associated with increasing tumour location in the UOQ may be offset by concomitant increases in the LIQ. In our study, tumours in the UOQ showed a trend towards favourable prognosis although this did not reach the level of significance (P = 0.0754). The less favourable prognosis seen in patients with tumours in the central region can be attributed to increased tumour size and positive lymph node status.[8] Tumour size is thought to reflect the chronological age of the tumour, with smaller tumours being resected earlier than larger tumours. Tumour size has been associated with positive lymph node status in multiple studies. In addition, tumour size is also prognostic in patients with both negative and positive lymph node status. Thus, tumour location in the central region is a surrogate for larger tumour size, resulting in increased rates of metastatic lymph node and breast cancer mortality [21, 22]. Previous studies have demonstrated that tumours within the central region are harder to detect than at other sites and that tumours in this region are more easily detected by clinical examination than mammography. This difficulty in detecting tumours in the central region have been attributed to overpenetration of X-rays in the nipple-areolar complex; accurate diagnosis in this region may require the use of multiple imaging modalities [9, 10, 20].

FIBROADENOMA

RIGHT

UL   44%   22%   UM

LL   30.5%   3.4%   LM

LEFT

UM   10.8%   48.6%   UL

LM   0%   40.5%   L

29%   21%
21%
29%   0%

20%   40%
7%
7%   26%

Pattern recognition is defined as ―the act of taking in raw data and taking an action based on category of pattern‖. Its aim is to classify patterns based on prior knowledge or statistical information extracted from patterns. Here, the perspective is on identification of pattern that is based on various morphological attributes on aspirates of breast lesions (cellular features, background material, and other features) [11, 12, 19].

Biphasic pattern usually include epithelial cells and myoepithelial cells arranged in mono-layered sheets with a honeycomb pattern (―antler-like, staghorn‖). The presence of myoepithelial cells has been recognized as a prominent feature of benign breast disease. Lesions with biphasic pattern are most often benign, hence identification of this pattern is an important aspect of breast lesions [13, 14, 18].

Macrophage-rich pattern is seen predominantly in fibrocystic change and in cysts which usually showed foam cells, apocrine cells, and occasionally non-apocrine cells. Smears with apocrine cells showing degenerative atypia should be interpreted with caution, taking into consideration background patterns like proteinaceous background (for benign cystic lesion of breast) and hemorrhagic background (to rule out malignancy) [15, 16, 17, 23].

CONCLUSION

The most common age group of breast lesions was 6th decade in males and 3rd decade in females. There was left breast predominance and lump was the most frequent clinical symptom in both the genders. Among the benign lesion fibroadenoma (53.4%)

showed highest occurrence whereas in malignant lesions, it was IDCC (71.4%).

Lateral outer quadrant showed highest involvement for fibroadenoma (58.6%) among the benign lesions Calculated risk for fibroadenoma is very low (3%).

Therefore, it can be concluded that benign lesions occurring in lateral upper quadrant carry good prognosis.

Most common quadrant of involvement for IDCC (78.5) in our study was lateral outer quadrant again. SEER coding for IDCC was2

Studies have shown IDCC occurring in lateral outer quadrant carries better prognosis when compared to other quadrants. Thus, we conclude that, quadrant location of breast lump carries significance in prognosis.

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