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DISTRIBUTION OF BENIGN AND MALIGNANT LESIONS AMONG SUSPECTED CASES OF MALIGNANCY IN AL-YARMOK BREAST CLINIC

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ABSTRACT

Background: Surgical pathology focuses on breast lesions, especially with breast cancer on the rise. Pre-surgery diagnosis accuracy is increasingly important. Imaging, clinical examination, and Fine Needle Aspiration Cytology (FNAC) / Histopathology are the best ways to assess breast abnormalities preoperatively. FNAC/tru cut results of breast lesions will be compared and correlated with suspicious and strongly suggestive of malignancy finding (BIRADS 4 & 5) on mammography/US or both to determine concordance/disconcordance of malignancy in diverse breast lesions. **Method:** From November 2022 to November 2023, 180 female patients who had BIRADS category 4 and 5 findings on US/mammography or both were enrolled in a cross-sectional study at the breast clinic in Al-Yarmok Teaching Hospital. Imaging BIRADS (mammogram/ultrasound), Cytology fine needle aspiration (FNA), (True cut) Histopathology, are collected from females. **Results:** In a study, 84.4% of patients over 40 years old presented with various breast conditions, with 46.1% diagnosed as malignant and 53.9% as benign. A significant correlation was found between malignancy diagnosis and age, especially in patients over 40, and BIRAD scores, with 100% of BIRAD 5 cases being malignant. No significant link was observed between the diagnosis and the initial presentation reason. **Conclusion:** A large number of breast cancer cases are identified in women over 40, according to the research. A precise diagnostic method based on patient age and BI-RADS categorization is needed to enhance breast cancer identification and care. Categories 4c and 5 accurately predict malignancy.

KEYWORDS: Distribution, benign, malignant, lesions, suspected, breast clinic.

INTRODUCTION

Breast lesions present a significant area of focus within the realm of surgical pathology, especially in the context of the escalating incidence of breast carcinoma. Achieving a high degree of diagnostic accuracy prior to surgery is increasingly critical. The most effective method for reaching the pinnacle of preoperative diagnostic precision in the assessment of breast lesions involves a multifaceted approach, incorporating imaging studies, clinical examination, and Fine Needle Aspiration Cytology (FNAC) / Histopathology. When these three diagnostic modalities are synergistically utilized, the accuracy rate for preoperative diagnosis can surpass 99%.[1,2] The American College of Radiology (ACR) has introduced the Breast Imaging-Reporting and Data System (BI-RADS) as a mean to standardize the evaluation and documentation of breast lesions, aiming to minimize ambiguity in the interpretation of breast imaging results. BI-RADS provides a comprehensive framework, including a glossary of uniform terminology for mammography, ultrasound, and MRI, alongside sections dedicated to report structuring, operational guidance, and practical application.[3,4] BI-RADS Category 3 lesions are deemed to have a malignancy probability of 2% or less. Conversely, lesions classified under BI-RADS Category 4 exhibit a broad spectrum of predictive values for malignancy, ranging from 2% to 95%, which poses challenges in lesion reporting.[5] According to Bent et al., the estimated risk of malignancy ranges from 2-10% for subcategory 4a, 10-50% for 4b, and 50-95% for 4c.[5] A concordant BI-RADS 4 classification (suspicious vs. malignant) refers to a lesion that exhibits suspicious characteristics for malignancy on ultrasound or mammographic evaluation

and is confirmed as malignant through pathological analysis.[5] In contrast, disconcordent BI-RADS 4 classification (suspicious vs. benign) applies to a lesion identified as suspicious on imaging, where FNAC does not confirm malignancy.[5] Lesions classified under Category 5 on imaging are believed to have a higher likelihood of being malignant compared to Category 4 lesions and are used to denote lesions that are almost certainly malignant.[6] A concordant BI-RADS 5 classification (malignant vs. malignant) is assigned to lesions that show highly suggestive evidence of malignancy on imaging and are confirmed as malignant through pathology.[5] The correlation between imaging and pathology is crucial in imaging-guided breast biopsies to identify potential sampling errors and prevent delays in diagnosis. Core biopsy has been demonstrated to offer superior sensitivity and specificity compared to FNAC. Nonetheless, the rapid, cost-effective, and foundational diagnosis provided by FNAC remains invaluable. In experienced hands, FNAC can achieve exceptionally high rates of sensitivity, specificity, and minimal false positive or negative outcomes.[7,8] The aim of study is to compare and correlate the FNAC / tru cut findings of breast lesions with BIRADS 4 & 5 on mammography/ US or both and to find out the concordance/ disconcordance of malignancy in various breast lesions between FANC/ tru cut findings and BIRADS 4&5.

METHOD

Cross sectional study of 180 females visited the breast clinic in Al-Yarmok teaching hospital from November 2022 till November 2023, all patients who had BIRADS category 4 and 5 results on US/ mammography or both (suspicious and highly suggestive of malignancy) were included. The data collected from report file of clints are: Age groups (more than 40 and less than 40 years old), presentation (axillary mass, breast mass, mastalgia, nipple change, screening and skin changes), imagining BIRADS (mammogram/ultrasound), Cytology fine needle aspiration (FNA), (True cut) Histopathology, diagnosis (benign or malignant). The statistical analysis was carried out using SPSS version 22, employing frequency and percentage for categorical data, and mean and standard deviation (SD) for continuous data. The chi-square test was utilized to determine the association between categorical variables, A p-value of 0.05 or lower was considered statistically significant.

RESULTS

Mean age 49 ± 12 years, 84.4% of patients age more than 40 years old, 56.1% of patients presented with breast mass, 29.4% of them presented for screening only. 44.4% of females have BIRADS (4a), 24.4% of them have BIRADS (4b) on imagining. 52.2% of females had true cut biopsy. 46.1% of females were diagnosed malignant while 53.9% of them diagnosed as benign lesions. As shown in table 1.

Table 1: distribution of females according to study variables.

Variables		Frequency	Percentage
Age groups (years)	*<40*	28	15.6
	≥40	152	84.4
Presentation	*axillary mass*	8	4.4
	breast mass	101	56.1
	mastalgia	13	7.3
	nipple change	2	1.1
	screening	53	29.4
	skin changes	3	1.7
Imagining (BIRAD)	*4a*	80	44.4
	4b	44	24.4
	4c	29	16.1
	5	27	15.1
Cytology Histopathology	*FNA*	86	47.8
	True cut	94	52.2
Diagnosis	*Benign*	97	53.9
	Malignant	83	46.1

As shown in table 2-3 there is significant association between diagnosis and age; 52.6% of females at age 40 years and more diagnosed as malignancy, while 89.3% of them age below 40 diagnosed as benign lesion. Also there is significant association between diagnosis and BIRAD, 100% of females have BIRAD (5) diagnosed as malignancy, in addition to 58.6% of them with BIRAD (4c) diagnosed as malignancy. But there is no significant association between diagnosis and presentation of females.

Table 2: relationship between diagnosis and age groups.

Variables		Diagnosis		P-value
		Benign	**Malignant**	
Age group (years)	***<40***	25 89.3%	3 10.7%	**0.0001**
	≥40	72 47.4%	80 52.6%	

Table 3: association between diagnosis and presentation.

Variables		Diagnosis		P-value
		Benign	**Malignant**	
Presentation	***axillary mass***	6 75.0%	2 25.0%	0.27
	breast mass	52 51.5%	49 48.5%	
	Mastalgia	9 69.2%	4 30.8%	
	nipple change	1 50.0%	1 50.0%	
	Screening	29 54.7%	24 45.3%	
	skin changes	0 0.0%	3 100.0%	

Table 4: association between diagnosis and Imaginig BIRAD.

Variables		Diagnosis		P-value
		Benign	**Malignant**	
Imaginig BIRAD	***4a***	64 80.0%	16 20.0%	**0.0001**
	4b	21 47.7%	23 52.3%	
	4c	12 41.4%	17 58.6%	
	5	0 0.0%	27 100.0%	

DISCUSSION

Mammography's extensive implementation has fundamentally altered the diagnostic strategy for breast cancer. Mammography can also detect tumours as small as 1-2 mm in diameter. The primary determinant of diagnosis is calcification. Positive calcifications are observed in 50–60% of breast carcinoma cases and 20% of benign lesions. However, a negative mammogram does not eliminate the possibility of carcinoma, as this technique is incapable of detecting around 20% of palpable tumours.[9] The mean age of the study population at 49 ± 12 years, with 84.4% of patients being over 40, aligns with existing research that underscores the increased risk of breast cancer with age. Studies have consistently shown that the incidence of breast cancer rises significantly in women over 40, which our data corroborates, indicating a heightened need for vigilant screening and diagnostic procedures in this age group.[10] The diagnostic outcomes based on BI-RADS classification further reinforce the established utility of this system in stratifying breast lesion malignancy risk. Our findings, showing that 100% of BI-RADS 5 lesions were malignant and 58.6% of BI-RADS 4c lesions were malignant, resonate with the literature which positions BI-RADS 5 as highly indicative of malignancy and supports the notion that a higher BI-RADS category correlates with an increased likelihood of cancer.[11] The subdivision of BI-RADS Category 4 into 4a, 4b, and 4c, with escalating probabilities of malignancy, is validated by our data, emphasizing the precision and utility of nuanced BI-RADS categorization in clinical practice.[12] Contrary to our findings, some studies have reported a less pronounced correlation between BI-RADS categories and the likelihood of malignancy, particularly in the intermediate categories (4a, 4b, 4c). For instance, certain research has suggested a wider variability in malignancy rates within these subcategories, pointing towards the need for further refinement and individualized patient assessment.[13,14] Moreover, while our study found no significant association between the

presentation of patients (symptomatic vs. screening) and diagnosis, other studies have highlighted that symptomatic presentations, particularly palpable breast masses, are more often associated with higher rates of malignancy compared to lesions detected via screening in asymptomatic individuals. This discrepancy may suggest variability in population characteristics or differences in screening practices and awareness across different settings.[15] This study reveals that the majority of patients presented with a breast mass (56.1%), followed by screening purposes (29.4%), mastalgia (7.3%), skin changes (1.7%), and nipple changes (1.1%). The high incidence of breast masses emphasizes the need for efficient diagnostic methods to distinguish benign from malignant lesions. Screening's notable second place highlights the success of awareness and early detection programs. Comparatively, presentations for mastalgia, nipple, and skin changes underscore the importance of educating women on diverse symptoms of breast conditions to facilitate early diagnosis and treatment. The evaluation of a breast mass integrates imaging, fine needle aspiration (FNA), and true cut histopathology to accurately diagnose and manage the condition. Moreover evaluation suspicious lesions identified during screening, FNA provides rapid preliminary results, and histopathology offers a definitive diagnosis and detailed cancer characterization. This comprehensive approach ensures effective treatment planning and improved patient outcomes by leveraging the strengths of each diagnostic modality.[16]

CONCLUSION

The study demonstrates a clear age-related increase in breast cancer risk, with a significant proportion of malignancies diagnosed in women over 40 years old. The BI-RADS classification, particularly categories 4c and 5, effectively predicts malignancy, highlighting the need for precise diagnostic approaches based on patient age and BI-RADS categorization to improve breast cancer detection and management.

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