

## Correlation Between Different Radiological Findings and Histopathological diagnosis of Breast Diseases: Retrospective Review Conducted Over Six Years in King Fahad University Hospital in Eastern Province, Saudi Arabia

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**Abstract :** The aim of this study is to correlate between radiological findings and histopathological results in regard to the breast imaging-reporting and data system scores, size of breast masses, molecular subtypes and suspicious radiological features, as well as to assess the concordance rate in histological grade between core biopsy and surgical excision among breast cancer patients, followed by analyzing the change of concordance rate in relation to neoadjuvant chemotherapy in a Saudi population. A retrospective review was conducted over 6-year period (2017-2022) on all breast core biopsies of women preceded by radiological investigation. Chi-squared test ( $\chi^2$ ) was performed on qualitative data, the Mann-Whitney test for quantitative non-parametric variables, and the Kappa test for grade agreement. A total of 641 cases were included. Ultrasound, mammography, and magnetic resonance imaging demonstrated diagnostic accuracies of 85%, 77.9% and 86.9%; respectively. magnetic resonance imaging manifested the highest sensitivity (72.2%), and the lowest was for ultrasound (61%). Concordance in tumor size with final excisions was best in magnetic resonance imaging, while mammography demonstrated a higher tendency of overestimation (41.9%), and ultrasound showed the highest underestimation (67.7%). The association between basal-like molecular subtypes and the breast imaging-reporting and data system score 5 classifications was statistically significant only for magnetic resonance imaging ( $p=0.04$ ). Luminal subtypes demonstrated a significantly higher percentage of speculation in mammography. Breast imaging-reporting and data system score 4 manifested a substantial number of benign pathologies in all the 3 modalities. A fair concordance rate ( $k= 0.212$  &  $0.379$ ) was demonstrated between excision and the preceding core biopsy grading with and without neoadjuvant therapy, respectively. The results demonstrated a down-grading in cases post-neoadjuvant therapy. In cases who did not receive neoadjuvant therapy, underestimation of tumor grade in biopsy was evident. In summary, magnetic resonance imaging had the highest sensitivity, specificity, positive predictive value and accuracy of both diagnosis and estimation of tumor size. Mammography demonstrated better sensitivity than ultrasound and had the highest negative predictive value, but ultrasound had better specificity, positive predictive value and accuracy. Therefore, the combination of different modalities is advantageous. The concordance rate of core biopsy grading with excision was not impacted by neoadjuvant therapy.

**Keywords :** breast cancer, mammography, MRI, neoadjuvant, pathology, US

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