

A Comparison of Three-Dimensional Digital Breast Tomosynthesis (3D-DBT) and Two-Dimensional Full-Field Digital Mammography (2D-FFDM) in Characterization of Breast Lesions

AGOK Wimaladharm^{1#}, NIA Silva¹, and HS Niroshani¹

¹Department of Radiography and Radiotherapy, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka

[#]oshadhiwimaladharm@gmail.com

The shape of mammographically identified breast lesions serves as a crucial indicator in determining whether a lesion is benign or malignant. The study aimed to compare the efficacy effectiveness of 3D-DBT versus 2D-FFDM in characterizing breast lesions by shape. The study involved included mammography images of 54 subjects with 32 round and 22 spiculated lesions. Mammographic images were analysed using Fiji ImageJ software. The mean density value of round shaped lesions in 2D FFDM and 3D DBT were 2328.38 (± 549.10) and 493.47 (± 55.37) with mean ratios of density values as 2.28 (± 0.65) and 1.38 (± 0.17). For spiculated shaped lesions in 2D FFDM and 3D DBT, the mean density value was 2499.78 (± 451.85) and 565.61 (± 222.27), with a mean ratio of density values 2.48 (± 0.55) and 1.51 (± 0.29). The mean density value of the round shape lesions in 2D and 3D were 2382.20 (± 587.15) and 500.18 (± 56.03) for CC view while they were 2274.57 (± 511.88), 486.76 (± 54.75) for MLO view respectively. Significant age-based variation was observed between round (mean age 55) and spiculated (mean age 60) lesions, while no significant difference in lesion shape was found regarding Compressed Breast Thickness values. There was insignificant difference in Mean Glandular Dose and Entrance Surface Dose between 2D and 3D for both type lesions ($P > 0.05$). Hence, 2D FFDM exhibited higher density values compared to 3D DBT, 2D FFDM is valuable for distinguishing between malignant and benign breast lesions based on density values, offering enhanced structural details.

Keywords: *breast cancer, diagnostic accuracy, mammography, lesion shape, density values*