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The diagnostic role of diffusion weighted imaging in the follow up of breast cancer patients after surgical treatment

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Objective: To assess the additive role of Diffusion weighted imaging (DWI) to dynamic contrast-enhanced magnetic resonance mammography (DCE-MRM) in evaluating breast cancer patients who underwent surgery (conservative or radical) and radiotherapy.

Patients & Methods: 60 female patients were included in this prospective study. This study was conducted at both Kasr El-Ainy hospital, radiology department (Women's imaging unit) and National Cancer Institute (N.C.I) from March-2013 until March 2015. All cases underwent either breast conservative therapy (BCT) or radical mastectomy at least 6 months before doing their MRI. Recurrence or post-operative complications were suspected by clinical examination. Mammography and breast US were done followed by MRI examination. DCM was done with DWI with b values of (0, 50, and 850). Pathology or stationery course of lesions on follow up were the gold standard.

Results: Out of the 60 patients, 27 were pathologically proven as malignant lesions compared to 33 patients with variable spectrum of post-operative changes. In our study, DCE- MRI was superior to DWI in diagnosis of malignant lesions with 2 false positive cases and no false negative cases while DWI showed 3 false negative cases and 4 false positive cases. DCE-MRI sequence & DWI showed sensitivity (100%, 88.9%), specificity (93.9%, 87.9%), PPV (93.1%, 88.9%), NPP (100%, 90.6%) & accuracy (96.7%, 88.3%) respectively.

Conclusion: Although DWI is considered a promising diagnostic tool in the diagnosis of breast cancer, its interpretation requires awareness of its possible pitfalls, weakness and strengths. Better results are obtained by combing DWI with dynamic sequences. DWI possibly can be an alternative to contrast injection at certain conditions as in patients with renal impairment.

Detection of early biological and immunohistochemical markers for ductal carcinoma in situ and prediction of invasive breast cancer

Tanushri Mukherjee

Early diagnosis of breast cancer and effective treatment is the best modality. The breast ductal carcinoma in situ (DCIS) is an early, premalignant lesion in the evolution of invasive breast carcinoma. DCIS represents 20-45% of all new cases of mammographically detected breast cancer, and about 10% of all breast carcinomas. DCIS cases are identified as suspicious micro-calcifications through mammography but that often underestimates the pathologic extent of DCIS and the number of tumor foci. Early detection of DCIS is very important because it is a highly curable disease, with a 10-year cancer-specific survival rate of over 97%. Biomarkers which can be analyzed immunohistochemically in tissue blocks in a noninvasive and economic way. Early detection of DCIS with molecular markers allows early diagnosis and prevention of breast cancer. These markers are DEPDC1, NUSAP1, EXO1, RRM2, FOXM1, MUC1 and SPP1 which allow early detection of DCIS and invasive carcinomas especially in high risk cases with strong familial predisposition.