

Assessment Cardiac Side Effects in Patients with Left-Sides Breast Cancer Treatment by Hypofractionated and Conventional Radiation Therapy

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Abstract

Introduction: Breast cancer (BC) is the most common cancer in women. Radiation therapy (RT) in the management of patients with breast cancer is treated, plays an important role. RT techniques have improved over time, but if you take a large part of the heart irradiated, may induce early and late complications of the heart. So a technique that makes treatment time is reduced to half, while the results of the same make, with many reception faces. Evaluating coronary artery using by imaging methods, the prevalence of cardiovascular risk after RT is clearly shown. In this study, we were compared cardiac complications in both techniques hypofractionated and conventional RT in patients with left-side breast cancer by using SPECT.

Materials and Methods: In this study, cardiac complications between the both techniques hypofractionated (42.5 Gy, 16 fra in 3½ weeks with 2.66 Gy/fra) and conventional (50 Gy, 25 fra in 5 weeks with 2 Gy/fra) RT in patients with left-side BC by using SPECT before and six months after treatment in stress/Rest gated state were studied. The statistical data were analyzed by using IBM SPSS v22; Then to analyze the data, Pearson correlation coefficient, independent and paired student test, Mann-Whitney and Wilcoxon tests were used. The p-values <0.05 were considered to be statistically significant.

Results: The findings show that between the LVEF before and six months after RT, there is no statistical significant difference. However, there was a negative correlation between changes in LVEF and myocardial perfusion abnormalities (changes SSS and SRS) in the conventional and hypofractionated treatment group, but only in conventional group statistical significant (R = -0.591, P = 0.011 and R = -0.598, P = 0.003) respectively. In assessment quantitative data related to the cardiac perfusion parameters SSS, SDS and SRS have increased were statistically significant in the two treatment groups (conventional P=0.000, P=0.000 and P= 0.002; hypofractionated P=0.001, P=0.006 and P=0.004) respectively. Qualitative assessment is performed by evaluating severity and nature of myocardial perfusion defects. The prevalence severity of myocardial perfusion defects in patients conventional and hypofractionated treatment group, 39.1% vs 39.1% mild, 21.7% vs 38.5% moderate, 21.7% vs 23.1% severe respectively. Nature of myocardial perfusion defects, 26.09% vs 30.77% reversible, 34.78% vs 30.77% mixed and 21.74% vs 15.38% fixed lesions were observed. However, in assessment quantitative and qualitative parameters associated with myocardial perfusion, no statistical difference was observed between the two treatment groups.

Conclusions: The amount of radiation-induced heart disease in conventional and hypofractionated RT techniques over a period of six months difference was not found.