

Radiation doses to heart and contralateral breast: A comparison of different left chest wall irradiation techniques

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PAJO, June 2013, 6(2): 18-22

Abstract

Introduction: Reduction of heart and contra-lateral breast (CB) doses is considered an important factor when selecting radiotherapy technique in left sided breast cancer patients.

Aim: To compare radiation doses received by heart and CB using three different left chest wall irradiation techniques aiming to achieve optimum technique with good target coverage and sparing of heart and CB among patients with left breast cancer treated by modified radical mastectomy according to size of CB & PTV.

Methods: CT simulation was performed for ten left sided breast cancer patients. Three techniques using different shielding (multileaf collimator (MLCs), asymmetric half-beam technique (HBB) and lead custom block).of the lungs, heart and CB were generated for tangential fields. The dose volume parameters (DVPs) of the three plans were analyzed statistically. A correlation was tested between the differences in DVPs of the plans and the volume of PTV and CB to find out which technique shows the best DVPs according to size of CB & PTV.

Results: Lead custom block shows the best heart & CB sparing. The significant correlation between the differences of the DVPs of the plans and volume of PTV and CB showed that the volume of PTV and CB help in the selection of optimum technique.

Conclusion: Volume of PTV and CB are the predictors for selection of the optimum technique. Lead custom block is the best shielding method especially in patients with small PTV and CB while MLCs could be used in patient with large CB.