

عنوان مقاله:

Effect of Bolus Frequency and Its Thickness in Postmastectomy Three-dimensional Conformal Radiotherapy on Skin Dose for Superposition Algorithm

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خلاصه مقاله:

Introduction: The postmastectomy radiotherapy uses bolus to improve the coverage close to the skin; however, it needs to be removed in case of severe skin toxicity. This study investigated the effect of bolus parameters (i.e., frequency and thickness) for the superposition algorithm on skin dose in postmastectomy three-dimensional conformal radiotherapy (3D-CRT). Material and Methods: The present study was carried out on a total of 22 patients. First, all the plans were calculated without using bolus. Then, the plans were recalculated using different bolus frequencies (5, 10, 15, 20, 25) and thicknesses (0.5 and 1 cm). To evaluate the dose delivered to the skin, a 2-mm thick skin was profiled, and statistical analysis was performed by studying the dosimetric parameters (i.e., minimum, mean, and maximum) of chest wall skin. Results: The superficial coverage of planning target volume (PTV) was better by using bolus. In the case of skin, the bolus thickness had a significant impact on the minimum and mean doses for all bolus frequencies, while there was no significant effect on the maximum before 20-bolus frequency. The bolus frequency increase demonstrated a significant difference on all dosimetric parameters of the skin, except the maximum showed no significant difference between 0 and 5-bolus frequencies. Conclusion: The obtained results indicated that the bolus use had generally a significant effect on the chest wall skin dosimetric parameters depending on bolus frequency and thickness. Therefore, the choice of bolus frequency and bolus thickness can affect the clinical decisions in certain cases.

کلمات کلیدی:

Bolus, Postmastectomy, Chest Wall, Skin dose, Superposition, Conformal Radiotherapy

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