عنوان مقاله:

Assessment of Dose Calculation Accuracy of TiGRT Treatment Planning System for Physical Wedged fields in Radiotherapy

محل انتشار:

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خلاصه مقاله:

Introduction Wedge modifiers are commonly applied in external beam radiotherapy to change the dose distribution corresponding to the body contour and to obtain a uniform dose distribution within the target volume. Since the radiation dose delivered to the target must be within ±5% of the prescribed dose, accurate dose calculation by a treatment planning system (TPS) is important. The objective of the present study was to quantify the dose calculation accuracy of TiGRT TPS for physical wedged fields in radiotherapy. Materials and Methods A Semiflex™ ionization chamber was used for dose measurements in a water phantom; TiGRT TPS was also applied for dose calculations. The central axis (i.e., high dose-small dose gradient), build-up (i.e., high dose-large dose gradient), off-axis (i.e., high dose-small dose gradient), and out-of-field (i.e., low dose-small dose gradient) regions were evaluated in this study. Finally, the confidence limit values were obtained to quantify the dose calculation accuracy of TPS in these regions. Results The confidence limit values for the central axis, build-up, off-axis, and out-of-field regions were 1.01, 8.62, 1.79, and 55.24, respectively. Furthermore, the results showed that TiGRT TPS underestimated the dose of build-up and out-of-field regions for most points. Conclusion According to the results of the present study, it can be concluded that the dose calculation accuracy of TiGRT TPS for physical wedged fields in the central axis, build-up, and off-axis regions is adequate, while it is insufficient for out-of-field regions.

کلمات کلیدی:

Accuracy, Dose, Radiotherapy, Treatment Planning, Wedge