

عنوان مقاله:

Monitor Unit Verification for Radiotherapy Irregular Fields Based On the Clarkson Method Combined With In-House MLC Shaper Software

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خلاصه مقاله:

Introduction: In the present scenario, high precision-radiotherapy is delivered through Linear accelerators in which the dose delivery is achieved by delivering the proper monitor unit (MU). Treatment planning for the patients is carried out through treatment planning systems (TPS) in which the precise computation of MU is crucial. This TPS - calculated MU has to be verified using manual calculations for accurate dose delivery. In this study, we incorporated our in-house developed multi leaf collimator(MLC) shaper software and the well-known Clarkson method to compare the calculated MUs to the TPS-generated MUs. Material and Methods: Conformal treatment plans of various sites of ۳۰ patients were randomly selected containing different MLC-shaped field sizes. All the fields were shaped using MLC (leaf width of ۱cm, ۴۰ pairs) in the TPS. MLC log files were exported and fed into the in-house shaper software to get crucial inputs for the Clarkson-based calculation. The Tissue Maximum Ratio(TMR) & Scatter Maximum ratio(SMR) were utilized in our investigation. The Clarkson MU calculation was compared with the TPS calculation method. Paired t-test was performed for the statistical significance. Results: The Clarkson method-based calculated had significant differences for all the esophageal cancers ($p < 0.05$); however no significant difference was found in the other sites. Conclusion: The compared MUs were within the acceptable deviation with the TPS for Head & Neck, Prostrate and Cervical cancer. The estimated MUs had significant difference in non-homogenous medium. The shaper software can be further enhanced to receive MLC log files from the TPS.

کلمات کلیدی:

Radiation Therapy, Conformal Radiotherapy, Dosimetry Calculations, Computer assisted

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