

عنوان مقاله:

Evaluation of Dose Calculation Accuracy of Isogray Treatment Planning System in Craniospinal Radiotherapy

محل انتشار:

مجله فیزیک پزشکی ایران، دوره 15، شماره 4 (سال: 1397)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

Introduction: Craniospinal radiotherapy is a therapeutic technique for central nervous system (CNS) tumors, which requires meticulous attention to technique and dosimetry. Treatment planning system (TPS) is one of the main equipment in radiotherapy; therefore, the evaluation of its accuracy is essential for dose calculation. The present study evaluates the validity of Isogray TPS in craniospinal irradiation techniques. **Material and Methods:** The computed tomography (CT) images of the brain and spine of the Rando phantom were acquired. Two techniques were designed. In technique 1, the whole CNS was irradiated with 6 MV photon beam. In technique 2, the brain and spine were irradiated with 6 MV photon and 18 MeV electron beam, respectively. The tumor and organs at risk doses were measured by thermoluminescent dosimeter (TLD). In addition, photon and electron dose measurements inside and outside the treatment field were accomplished using TLD, and then compared to the corresponding values calculated by TPS. **Results:** According to the results, in both electron and photon beams, the differences between the doses calculated by TLD and TPS for the points inside the treatment field were less than 4% for 90% of the measurement points. However, for the points outside the treatment field borders, the differences ranged within 10-40%. These differences were indicative of the sufficient dosimetric accuracy of Isogray TPS. **Conclusion:** The comparison of dosimetry results with those of TPS results revealed the accuracy of Isogray TPS. In both techniques, the maximum difference between the TLD- and TPS-measured doses was observed in the mandible.

کلمات کلیدی:

Craniospinal irradiation, CNS, TPS, Thermoluminescent Dosimetry

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