

Lateral isocenter deviations with source-skin distance variation in radiation treatments of pelvic cancer

Abstract

Purpose: To verify if the Source-Skin Distance (SSD) of lateral pelvic fields is directly related to the lateral (X) deviation of the isocenter position.

Introduction: The evolution of the radiotherapy throughout the 20th century allowed it to become a therapeutic modality widely used. To accurately administrate radiation treatment to a patient, the setup and positioning is extremely important. The SSD can be used as a confirmation of verification of patient's correct positioning. Therefore, it is importante to study its relationship with the obtained isocenter deviations.

Materials and Methods: From January to August of 2013, 37 patients were treated to the pelvic region in the supine position. 665 cases were analyzed regarding the variation of SSD value in the lateral fields. SSDs variations were analyzed in a daily basis and compared with the planned SSD, either before or during the treatment, through the use of portal images. All data was collected into a table and graphics, based on the *Offline Review*[®] program information.

Results: When there were no significant deviations (up to 0.3cm) between the planned and actual SSD, 88% of the cases did not show evidence of having a lateral deviation of the isocenter position. Additionally, when significant deviations (greater than 0.3cm) were registered, 54% of the cases justify those values, presenting a lateral deviation of the isocenter.

Discussion; Although there were 12% cases registered showing an isocenter deviation in the lateral direction when the SSD value was kept under 0.3cm, this is not significant statistically when compared to those values demonstrating an agreement between the planned and actual value of SSD (88%) and not having a deviation on the isocenter lateral axis. Therefore, the lateral deviation of the isocenter can be related to the SSD value observed in the lateral pelvic fields, in a daily basis. Regarding the 54% cases in which the SSD value observed was greater than 0.3cm, and the isocenter lateral deviation was kept within the specifications, this result did not respond to the expectation. Rather that, it is significantly higher than expected. However, even not totally supporting

the study, the result does not compromise the proved relationship between the SSD value and the lateral deviation of the isocenter.

Conclusions: This study demonstrates an existing relationship between the SSD in the lateral pelvic fields and the lateral deviation of the isocenter position. Therefore, this parameter should be verified daily to avoid setup deviations in the lateral direction of the isocenter.

Key-Words: Source-skin distance, lateral deviation, radiotherapy, pelvic cancer.