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Intra fractional set-up measurements between EPID and CBCT

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The aim of this study was to evaluate three-dimensional set-up errors, systematic and random set-up errors between the electronic portal imaging device (EPID) and CBCT to determine optimum planning target volume (PTV) coverage margins in our clinic. This study was performed on 25 cancer patients, treated with Siemens Artiste LINAC.EPID and CBCT projections of set-up fields were acquired simultaneously for each patients. The systematic and random error for individual and population were calculated both portal imaging and CBCT protections. The standard deviations of systematic ( ) and random set-up errors ( ) were calculated both imaging techniques to determine CTV-PTV margins according to ICRU Report 62 recommendations, along wih Stroom's and van Herk's formulae. Linear regression analysis of the EPID setup data as a function of the CBCT data were performed. The paired t-test was used to evaluate whether the EPID setup data were significantly different from the CBCT setup data. Correlations between the setup difference between EPID and CBCT were tested with the Pearson correlation coefficient. According to portal imaging result, CTV to PTV margins were found less than CBCT projections results in consequence of the manuel reconstructions while using portal imaging. As compared to our traditional margin of 5 mm in our clinic, it seems that we can further increase DV direction of the CTV to PTV margin to ensure at least 95% dose to 99% of the CTV using Van Herk and Stroom equations. The regression coefficient ( ) for the LR, CC, and DV directions were 0.11 (95% confidence interval [CI]=(-0.323)-(0.648)), 0.01 (95% CI=(-0.349)-(0.495)) and 0.24 (95% CI=0.039-0.597), respectively.

Biography

Asli Yazici has completed her MD from Institute of Nuclear Science of Ankara University. She has been working in Onko Ankara Oncology Center since 2011 as a Medical Physicist. She has performed treatment planning (IMRT-IGRT, conformal and complex techniques), daily-weekly-yearly QA's of LINAC and patient QA's in routine.

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