



Contribution ID: 38

Type: Poster

Influence of New Contrast Agent on CT Based Radiotherapy Treatment Planning

Thursday, 27 August 2015 14:00 (1h 30m)

Background.The patient is often given a contrast agent in radiotherapy. The contrast agent must reflect the density of organ, but also allow better visualisation. This study was done to determine the appropriate concentration of a new contrast agent used in our clinic for radiotherapy treatment planning.

Materials.The newly purchased contrast agent was used to mark vagina in gynaecological patients, in the same manner and prescription as for an old type of contrast agent. The first patient scanned on CT gave extremely glowing white area instead of vagina, after which the investigation and study were done. The cylindrical phantom with inserts was CT scanned and analyzed. The inserts were filled with contrast agent of different concentrations.

Results.The concentrations of 100%, 50%, 25%, 12.5%, 6.25%, 5%, 2.5%, 1.25%, 0.65% and 0.325% were made and CT scanned. The HU values accordingly were obtained: 3071 HU, 3071 HU, 1822 HU, 117 HU, 668 HU, 440 HU, 356 HU, 291 HU, 123 HU and 56 HU. The prescription given for the new contrast was set to 1.25%, that is 12.5 ml to 1 l of water. The prescription for previous contrast agent was 25 ml to 1 l of water (twice as new) which explained the glowing of organ with contrast.

Conclusion.Concentration of a contrast agent must be as low as possible, so that its influence on treatment planning result is minimized, but also visibility enhanced. It was concluded in this case that the high concentration of contrast agent in the treatment planning system, may influence up to 6% on the time of irradiation, depending on the concentration of an agent. High concentration of the agent causes underestimation of a dose, and consequently overirradiation of a patient.

Country or International Organization

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Session Classification: Session 11B: Posters: Nuclear Applications