

Enhancement of CT imaging via iodine and gadolinium-based contrast media

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The technology has been improved to clarify a tumor's location and size by utilizing X-ray contrast media in medical CT imaging techniques. In particular, X-ray contrast images of a phantom containing mixtures of contrast agents such as iodine and gadolinium have absorbed the X-rays high and are indicated to produce well-tolerated. Notably, it mentioned that iodinated contrast media is mostly non-ionic and safe to use.

This work focused on evaluating the effect of the X-ray imaging of the simplified phantom containing mixtures of iodine depending on the concentration, materials, and distribution under the CT model of two different types of target sizes are experimental and predictive in the GEANT4 toolkit. The X-ray contrast image on the detector demonstrated different tolerances for each material, and the brightest part was on the bone cortical. For the physical model, the highest contrast effect has been performed on the target with iodine at the highest concentration. However, it could not be demonstrated well in the biological model. The main factor was the contrast effect slightly increased according to the target thickness. Finally, this study indicates the possibility of obtaining CT images for a physical part in potential concentration below the toxic limit of iodine on the body by an in-silico method. We predict it gives potential values between the optimal size of tumor sites and the contrast agent.

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