

Accuracy of Asynchronous Quantitative Computed Tomography by Phantom Modelling

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Abstract

It is important to confirm the accuracy and reproducibility of densitometric studies of the assessment of mineral density, therefore, as part of the introduction of asynchronous quantitative computed tomography (QCT) on the basis of several Moscow medical organizations, it is necessary to evaluate its effectiveness, including the study of accuracy and reproducibility. To perform these works, anthropomorphic phantoms are used. In this work, the phantom developed by the authors is used. Assessment of accuracy indicators was carried out in three medical organizations, the results were calculated relative error, coefficient of variation. High reproducibility of the results of evaluation of bone mineral density by the asynchronous QCT method (0,06–0,86 %) was demonstrated. It was shown that the simulation of subcutaneous fat leads to an underestimation of the results of QCT. When using the optimal reconstruction filter, the relative error was in the range from -3,9 to 4,3 %.

Key words: Quantitative Computed Tomography, Osteoporosis, Diagnosis, Bone Mineral Density, Phantom Modeling, Accuracy Assessment.

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