AbstractID: 9299 Title: Evaluation of the performance of the fast scanning platform of an OCT system

Purpose: To ensure that the performance of a fast optical computed tomography (OCT) scanning system is comparable with previous models.

Method and Materials: MGS Research Inc. developed an OCT system based on the translate-rotate method used by early generation x-ray CT scanners. The performance of the system has been investigated and the system has been used in several published studies. Recently, a new OCT system was developed by MGS Research Inc. that reduces scan times by a factor of 10 or more. Several 3D dosimeters were irradiated using 6 MV photons and imaged on both version of the scanner. The image noise, reproducibility, and spatial accuracy were determined and used to evaluate the performance of the system.

Results: The new version of the scanner reduced the scan time per plane from 7 minutes to 30 seconds. Preliminary results showed that noise levels in the images from both models were comparable. The uncertainty in the determination of the optical density values from images acquired with both models was $\sim 2\%$. The new model uses Fresnel lenses that may need adjustment prior to an imaging session which can affect the reproducibility of the system.

Conclusion: The new version of the OCT scanner shows promise as a replacement for the previous version. Continued improvement in the software and hardware are needed to make the system as robust as the previous version.

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