AbstractID: 1355 Title: Quantitative Studies of Abdominal Organ Motions Resulting from Respiration Using Retrospective 4D CT Imaging

Submission to Junior Investigator's Competition

Abstract

Abdominal organ motion resulting from respiration has been measured using 4D CT scanning. Multiple consecutive CT images of the patient are acquired at each couch position. Simultaneously, the respiration of the patient is monitored and recorded using an external marker block taped to the patient's abdomen. Varian's Respiratory Position Monitoring system is used to observe and record the marker block's motion. Using the recorded respiratory pattern, the images are retrospectively organized into multiple 3D images each representing one breathing phase of the patient on GE Medical Systems 4D Advantage Workstation. These 3D images are then analyzed to measure the extent of organ motion from the end of inspiration to the end of expiration. The organs measured were the liver, spleen, pancreas, left kidney, and right kidney. There average superior-inferior motions were 1.6 cm for the liver, 1.3 cm for the spleen, 1.1 cm for the pancreas, 1.1 cm for the left kidney, and 1.4 cm for the right kidney. The average anterior-posterior motions were –0.62, -0.66, -0.40, -0.45, and –0.64 cm respectively, and average left-right motions were 0.12, -0.19, -0.09, -0.13, and 0.01 cm respectively.

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