

AbstractID: 1158 Title: Treatment setup for MRI-based Treatment Planning for Prostate IMRT

Although MR-CT imaging has been widely accepted as a practical approach for both accurate anatomical delineation (using MRI data) and dose calculations (using CT data) for prostate cancer patients the use of MRI alone for simulation and treatment planning will remove any errors associated with image fusion. Furthermore, it will reduce cost by avoiding redundant CT scans. The clinical implementation of MRI-based treatment planning for prostate IMRT is described. Our pilot studies have shown that using commercial treatment planning systems, both the AcQplan system (Philips Medical Systems, Cleveland, OH) and the Corvus inverse planning system version 5.0 (NOMOS, Corp., Sewickley, PA), dose calculations based on MRI derived homogenous patient geometry was adequate for prostate patients after MR image distortion was corrected. A practical method to derive MR-based DRRs for IMRT prostate patient setup was derived. The relevant bony structures including the pubic symphysis, acetabulum, femoral heads and sacrum were contoured using AcQSim and signed a bulk density of 2.0g/cm^3 . The bony structures were then clearly shown on the MR-derived DRRs and used for patient initial setup verification by comparing with portal films. The accuracy of this method was verified by comparing with CT derived DRRs (within 2-4 mm). The BAT (B-mode Acquisition and Targeting, NOMOS, Corp., Sewickley, PA) ultrasound system is also used for target localization for prostate IMRT with MR-based treatment planning to correct for intra-fraction motion.