

AbstractID:9551 Title :Comparing IGRT shifts with MV Cone Beam CT and CT on rails systems using anthropomorphic phantom

Purpose: To evaluate the IGRT repositioning shifts determined by MV Cone Beam CT and by CT on rails using an anthropomorphic phantom. **Material and Methods:** Two IGRT systems installed in the same LINAC room were studied. The CT based IGRT has been used in our Siemens Primus since 2004. Recently, a MV cone beam CT (Siemens MVision) was implemented with the objective to reduce the repeat time to obtain the IGRT shifts. The shifts and the corresponding total time were evaluated using an anthropomorphic PIXY® phantom. CTs of the phantom were obtained for head-and-neck, pelvis and lung and treatment planning was generated in XIO-CMS for each site. The set of images, structures and plans was sent to both IGRT stations. Bbs were placed on the phantom surface at the isocenter axis, as a reference for the daily CT images. For each plan the MV CBCT was obtained three times to determine its reproducibility for 5 and 8 MU protocols. The registration for MV CBCT was done automatically and verified with manual registration. The table was then flipped to the CT position and the images acquired. In this case the registration is done manually and the isocenter shift is obtained through the bbs position. The procedures were repeated for all sites. The total time to obtain the shifts and the image quality were also registered. **Results and Discussion:** The reproducibility of the MV CBCT for different protocols was within 2 mm. The maximum difference for MV CBCT and CT was 4 mm. The MV CBCT has poor image for soft tissue, and the fusion registration is based on mutual information. The total time to obtain the shifts is about 3 min for the new system and 7 to 8 min for the CT based system. This study excludes any deviation due to patient rotation and internal changes.