

AbstractID: 1339 Title: Image guided therapy for prostate cancer patients treated with a TomoTherapy unit

Image guidance for prostate cancer patients is gaining in popularity, particularly in conjunction with intensity modulated radiation therapy. A TomoTherapy unit was installed at our hospital in 2003 and several prostate cancer patients have been treated with the unit since then. This system offers a unique image guidance technique. With the patient in the treatment position a megavoltage (MV) CT is acquired just prior to treatment. The MVCT can be compared with the KVCT planning image. The method is in principle similar to daily CT imaging, but due to the higher beam energy the MVCT images differ in quality from regular KVCT images. All prostate patients treated with the unit had prostate markers implanted to aid the alignment process. However the anatomical information provided by the MVCT can also be used alone to align the gland. In this work we compare the MVCT alignments based on markers with those based on anatomical information only. Two aspects were compared: i) variability between alignments done by radiation technologists versus those done by a physician and ii) agreement relative to a reference alignment that is based on a center-of-marker-mass computation. Marker-based alignments showed less variability between users than anatomy-based alignments. The physician's marker and anatomy based alignments were in good agreement with the reference alignment. The use of implanted markers is advisable until more experience is gathered and a training program for anatomy-based alignments is developed. The marker data can be used to guide this effort.