

AbstractID: 2061 Title: Anatomical Shift Analysis With CT Images For The Repositioning Of Prostate Cancer Patients

Radiation therapy is a major treatment modality for prostate cancer. In the United States the incidence of prostate cancer is estimated to be 230,110 new cases in 2004 with 29,900 estimated deaths. A review of the literature reveals that the location of the prostate varies with respect to skeletal and other anatomical landmarks. A treatment margin must be added to the radiation field to account for prostate motion, and patient set-up errors. The study of a prostate displacement to assist with treatment planning utilizing TomoTherapy has been performed. Helical TomoTherapy is the latest development in radiation therapy that combines Intensity Modulated Radiation Therapy (IMRT) with daily CT imaging in an integrated system. The first commercial version, called Hi-Art², has the ability to obtain CT images of the patient on the treatment system prior to each treatment. The positional uncertainties associated with traditional radiation therapy and IMRT can be compensated for with daily imaging. Thus, the position of the tumor relative to the treatment beam can be corrected by moving the patient with appropriate offsets. Observation of prostate movement with respect to longitudinal, lateral, and vertical directions allowed accurate repositioning of the patient. Treatment planning must take into consideration the anterior rectal wall to reduce radiation-induced inflammation. The daily CT from ten patients were reviewed in this study. The patient overview with calculated standard deviation of shifts (measured in millimeters) in the longitudinal, lateral and vertical directions are presented.

Research supported by TomoTherapy, Inc.