

AbstractID: 4371 Title: A Study of Some Immobilization Techniques by Using an On Board Imaging System

Purpose: To study the effectiveness of a head and neck immobilization system and a prostate immobilization technique by using an on board imaging system.

Method and Materials: For head and neck, the immobilization system includes standard head rests, MEDTEC base plate and standard thermoplastic masks. For prostate, the MEDTEC HipFix system is used. All patients are in supine position. For head and neck, the daily setup is straight forward. For prostate, our Therapists developed a routine to set up patients. Varian Eclipse treatment computer system is used to generate the setup field DRR from 3 mm CT scan. Varian CL21EX with On Board Imaging (OBI) is used to setup the patient. KV or MV portal images of a lateral and an anterior or posterior setup fields are taken, and then align with corresponding DRR by using bony structures. The OBI software gives the couch shifts in vertical, lateral and longitudinal directions. The 3D (or vector) shifts are calculated from the three orthogonal shifts.

Results: About 900 prostate setups and 300 head and neck setups have been studied. For 52% of prostate setups and 32% of head and neck setups, the 3D couch shifts are 3 mm or less. For 82% of prostate setups and 60% of head and neck setups, the 3D couch shifts are 5 mm or less.

Conclusion: This study shows that the prostate immobilization technique gives very good reproducibility, and the head and neck immobilization is not as good. We will try to improve our head and neck immobilization method for IMRT purpose.