

AbstractID: 5080 Title: Implementation of On-Board Imager for daily Image-Guided Radiation Therapy in a multi vendor environment

Purpose: To report our initial experience of using Varian On-Board Imager (OBI) image-guided radiation therapy (IGRT), on a prostate patient with implanted fiducials. Varian's OBI-IGRT system enables clinicians to obtain high-quality daily kV images of the patient in treatment position. An attempt has been made to implement and evaluate various possible workflow issues, when using the Varian OBI system in a multi vendor environment.

Method and Materials: Daily shifts based on OBI images were made on an implanted fiducial prostate patient who underwent treatment on a Varian Trilogy Clinac. Using Varian's OBI 2D/2D matching software, orthogonal kV images were compared to Pinnacle³ (Philips) DRR's generated from the planning CT, to determine and correct for any daily target shifts. The kV images were transferred to our record and verification system IMPAC MultiAccess (Elekta), for physician review. The shifts predicted by the Varian software using manual matching, was compared daily, with the shifts predicted by the Acculoc software (Medtec), based on three implanted fiducials. In addition, cone beam CT (CBCT) scans were acquired once a week, to predict shifts using our in-house developed 3D/3D- matching software.

Results: Daily shifts predicted by the Varian OBI 2D/2D software, matched daily shifts predicted by the Acculoc fiducial alignment software to within 1 mm during the entire treatment course. The weekly CBCT scans also confirmed that these shifts were within 1 mm on the same treatment days. Various software issues were discovered and workarounds were proposed using in-house solutions. For example, the electronic graticule could not be transferred to ACCESS from the OBI software, etc.

Conclusions: In-house validations and implementations were needed to make all pieces of equipment work together correctly. Once the workflow was established, we demonstrated that OBI based IGRT solutions was consistent and clinically acceptable across different vendor's solutions.