

AbstractID: 10253 Title: First RapidArc treatment within the MOSAIQ environment: Implementation, procedure time frame and clinic flow

Purpose: Implementation of the first RapidArc treatment within the MOSAIQ record and verification system.

Method and Materials: A Catphan 504 phantom, and Varian isocenter cube with 2mm ball assembly were used in CBCT calibration with trilogly and MOSAIQ; a frozen bone-in ham was used in system dry run for RapidArc including CT simulation, treatment planning, KV-KV matching and CBCT position alignment and matching. An in-house designed dosimetric measurement and quality assurance (QA) system was constructed with solid water phantom blocks, ion chamber, and MapCheck.

Results: Manual shift and CBCT position alignment were compared with different settings in imaging acquisition, matching accuracy within 1mm in all vertical, longitudinal and lateral directions. Dosimetry and QA results including ion chamber measurement for full arc treatment delivery agree with the planning dose by -0.19%. 2D dose profile measurement using MapCheck at depth for half-arc delivery demonstrated Gamma function analysis agreement of 98.3% with tolerance of 3% dose and 3mm DTA. The first successful patient treated with RapidArc and CBCT with MOSAIQ was performed with position shift applied with Radiation Oncologist's approval. The total process from taking patient in the treatment room to completion of treatment is under 11minutes and the actual beam on time is 70 seconds.

Conclusions: RapidArc is the advancement of IMRT technology with therapy radiation delivered in a single gantry rotation. The challenges for the RapidArc clinic implantation with MOSAIQ involves team work in the clinic and with different vendors. By careful planning, we have developed a time frame for system testing and QA, staff training, dry run, and patient treatment, all without interrupting the clinic routine. Also, an efficient clinic flow has been developed for this type of treatment. Efficient time frame, accuracy, and safety are the keys for success.