AbstractID: 4351 Title: Treatment Table Induced Dose Perturbation in an IMRT Treatment

Purpose: Treatment table support bars create problems in treatment planning and delivery. It is a complex issue for the case of IMRT with multiple and varying size beamlets. Methodology to account for the dose perturbation due to the presence of the table support in IMRT treatments is presented.

Method and Materials: Five patients were planned with 7-beam IMRT using a posterior field and six other fields spaced at equal gantry angles. Treatment plans were optimized to produce suitable dose distributions for patient treatment. Plans were imported to solid phantom for dose verification. Treatment plan verification with ion chamber and film was carried out with and without bar. A mathematical weighted dose calculation is presented based on the equation: Dose = TD * [(MU-ΣMUij*T)/MU)], where TD is total prescribed dose, MU is total monitor unit from all beams, MUij is monitor unit in ith beam and jth beamlet that is blocked through the bar, and T is the measured transmission factor through bar. T was measured at 90 cm SSD at a depth of 10 cm for all photon energy and a film profile was taken.

Results: Measured transmission through the center of the Siemens table bar for 6 MV and 18 MV was found to be 72.9% and 78.8% respectively. Even though IMRT beamlets pass through the bar, the dosimetric effect is minimal. Measured and calculated doses through bar for all clinical cases show agreement within ±4.5%, which is within the limits of the IMRT criterion.

Conclusion: IMRT planning and treatment should be coordinated carefully to avoid passage of the beam through treatment table supports to avoid underdosage of the target area. However, in an accidental situation, methodology presented here provides simple and accurate dose estimates for an IMRT treatment.

Conflict of Interest (only if applicable): None