AbstractID: 8498 Title: GAF film dosimetry of a tandem positioned intravascular brachytherapy 90-Sr/Y 40 mm beta-source

This work presents relative dosimetric measurements of a cardiovascular brachytherapy source. When the segment of artery requiring radiation is longer than the single source length, a tandem positioning of the single source, known as “pull back”, is used. There are significant clinical interests to understand the dose distribution at the region of the source junction. Measurements were carried out using a Novoste Beta Cath 90-Sr/Y 40 mm beta-source in a white solid water phantom. Radiochromic MD-55-2 film was used as the dosimeter. The radiochromic film was calibrated using both 6 MV photon and 6 MeV electron beams. Readout was performed using a LUMISCAN 150 high-resolution laser film digitizer. Dose distributions in the near field region and the end region of a single source were measured. Dose in the overlap region of tandem irradiation was also measured. Significant deviation from prescription dose can occur depending on the amount of overlap or gap between tandem measurements. At a radial distance of 2 mm from the centerline of the source, the dose deviation was measured to be about –50% for a 2 mm gap, and +150% for a 2 mm overlap. Dose distributions in the overlap region as a function of source overlap and radial distance are presented. Measurements of the near field dose as close as 1.2 mm from the source are also presented. The results of these measurements are compared with published Monte Carlo data.