

AbstractID: 10427 Title: Dosimetric evaluation of gammamed high dose rate intraluminal brachytherapy applicators

**Purpose:**

The aim of this study was to dosimetrically evaluate various intraluminal brachytherapy applicators for the Gammamed high dose rate afterloading system.

**Materials and methods:**

Dosimetric evaluation was carried out for 8 mm, 10 mm, 12 mm and 14 mm diameter intraluminal applicators available with the Gammamed high dose rate afterloading system. Treatment planning for these applicators was carried out with abacus treatment planning system for active source length and 8 cm, 10 cm and 12 cm. All evaluations were carried out for prescription dose of 5 Gy at the reference point of 1cm from source axis. Reference volume length (RVL), Treated volume (TV), Hyper dose sleeve radius (HSR) were noted down from the isodose plans. Iterative, geometric and equal times optimization routines were carried out for all evaluations with step size of 0.5cm.

**Results:**

The isodose curves showed tapering pattern towards the distal and proximal regions. The reference volume lengths were larger than active source lengths for 8mm and 10mm diameter applicators. Reference volume lengths were smaller than active source length for 12mm and 14mm diameter applicators hyper dose sleeve radius decreases with increase in diameter of the applicator. For 14mm diameter applicators, the hyper dose sleeve radius was smaller than the radius of the reference isodose. Iterative optimization routine gave better average in terms of reference volume length few are four diameter applicators.

**Conclusions:**

We evaluated the dosimetric parameters for various intraluminal applicators available with the Gamma med high dose rate remote after loading system. The values of RVL and HSR were within acceptable limits for the four applicators considered in this study.