

AbstractID: 6957 Title: CT-based intra-cavitary High Dose Rate (HDR) Brachytherapy for Cervical Cancer: Planning and QA

Purpose: With the introduction of CT compatible GYN applicators, 3 dimensional (3D) conformal radiation treatment planning is now possible, which allows for quantitative analysis of dose specification, target, critical organ size and normal tissue DVHs.

Methods: Ten patients with gynecologic cancer who received image-based HDR brachytherapy were retrospectively identified. The patients received a CT scan each fraction after placement of applicators. Images were then transferred to PLATO planning system with organ contours of clinical target volume (CTV), rectum and bladder. Isodose lines were optimized using the feature of “geometry optimization” and dose was prescribed to the 100% Isodose line that mostly cover the CTV while sparing rectum and bladder.

Results: The mean CTV volume of the 10 patients had a shrinkage trend over the five fractions, with the first fraction of 77.4 cm³ and the last fraction of 65.5 cm³. Another observation was that point A dose increased as the CTV volume increased. This is reasonable considering the fact that our prescription dose was to cover the CTV with 100% isodose line. As a result, point A dose was larger to cover larger CTV volume.

Conclusions: CT based planning is valuable to evaluate changes in target size, dose to point A and dose distribution to all critical organs. Our experience showed that significant shrinkage of both gross tumor and normal uterus occurred along with brachytherapy fractions resulting in a lower point A dose. Longer follow-up is still necessary to determine optimal dose delivery to target tissues while sparing normal tissue.