

AbstractID: 9456 Title: Dosimetric Comparison of Bone Marrow-Sparing Intensity Modulated Radiation Therapy Versus Conventional Techniques for the Treatment of Cervical Cancer

Purpose: To compare bone marrow-sparing intensity modulated pelvic radiation therapy (BMS-IMRT) to conventional (AP/PA and 4-field box) techniques in the treatment of cervical cancer.

Method and Materials: Seven cervical cancer patients treated with concurrent chemotherapy and IMRT were analyzed. We compared BMS-IMRT to AP/PA and 4-field box plans. All plans were normalized to cover PTV with the 99% isodose line. The clinical target volume (CTV) consisted of the pelvic and presacral lymph nodes, uterus and cervix, upper vagina, and parametrial tissue. A 1.0 cm uniform margin was added to create the PTV. Normal tissues included bowel, bladder, and pelvic bone marrow (PBM), which comprised the lumbosacral spine (LSBM), ilium (IBM), and ischium, pubis, and proximal femora (lower pelvis bone marrow - LPBM). Dose volume histograms for PTV and normal tissues were compared for BMS-IMRT vs. 4-field box and AP/PA plans.

Results: BMS-IMRT was superior to 4-field box in reducing the dose to PBM, small bowel, rectum and bladder. Compared to AP/PA, BMS-IMRT reduced the PBM volume receiving a dose above 16.4Gy, however, that receiving below this threshold dose was increased. BMS-IMRT reduced IBM, LPBM and bowel radiation above 27.7Gy, 18.7 Gy, and 21.1 Gy, respectively, but increased dose below these thresholds, compared to AP/PA plans. BMS-IMRT reduced the volume of LSBM, rectum, small bowel, and bladder at all dose levels in all 7 patients.

Conclusion: BMS-IMRT reduced irradiation of PBM compared to 4-field box techniques. Compared to AP/PA, BMS-IMRT reduced LSBM irradiation and reduced the volume of PBM irradiated to high doses, but increased that irradiated to low doses. BMS-IMRT may reduce acute HT compared to conventional techniques.