AbstractID: 13337 Title: Seed Cloud Volume as Surrogate for Prostate Volume for Dosimetry of ¹²⁵I Permanent Brachytherapy

Purpose: Patients undergoing low dose rate ^{125}I seed implant for prostatic adenocarcinoma undergo post implant CT scans for dosimetry as well as to assess the change in prostatic volume due to post implant edema. This study describes the feasibility of using the seed cloud volume as a surrogate for prostate volume for assessing the edema factor from the post implant CT scans performed on day 0 and day 28. **Method & Material**: Twelve patients who underwent ^{125}I seed implant at CCI had post implant CT scans on day 0 and on day 28. The seeds were identified on the CT images, and the seed coordinates from these CT images and the seed coordinates of pre implant ultrasound plans were exported to Matlab. The seed cloud volume of the three image sets were determined using the 'convex hull' function implemented in Matlab. **Results**: The variation between the seed cloud volume and the prostate volume drawn on the ultrasound images obtained for the pre-plan TRUS volume study was about 1cc or less for 7 out of 12 patients, 3 to 5cc for three patients, and 7 to 10 cc for the remaining two patients. The post implant volumes drawn on the CT images did not correlate with the seed cloud volume. The edema factor determined for the seed cloud volumes of day 0 and day 28 CT scans showed a reduction in the edema for 10 out the 12 patients. **Conclusion**: From the analysis it is concluded that the seed cloud volume could possibly be used as surrogate for prostate volume to study the edema factor and also for post implant dosimetry