

Permanent implant low dose-rate brachytherapy is rapidly becoming a commonly-used modality for treating early stage prostate cancer. However, little data is available regarding post-implant displacements of the seeds. Methods for treatment planning and postplan analysis are integral steps in the treatment technique, but vary between institutions. In our institution, a preplan is determined based on a transrectal ultrasound volume study. Immediately following the implant, a PA X-ray is taken to verify proper seed placement. Approximately three weeks following the implant a CT scan and another X-ray are taken to serve as the basis for post-implant plan dosimetry. We have begun a series of studies to estimate the degree of seed movement and to determine the potential effect on post implant dosimetry. The post-implant images taken thus far, on two patients, reveal a wide distribution of seed displacements occurring over the first three weeks after implant. A preliminary two-dimensional analysis of seed locations on X-ray images for the first two patients indicates that roughly half the seeds are displaced about 1-2.5 mm in the film plane, but about 5-10% of seeds appear to travel from 4 mm up to 7 mm in the image plane. Swelling, the glandular makeup of the prostate, and the fluidity of surrounding tissue are possible causes for seed displacements. These results imply that further study of the time-course of typical seed displacements is warranted to understand the overall characteristics of the dose distributions which are actually delivered.