

AbstractID: 8553 Title: Stability and visibility of a novel non-migrating radiographic/radioactive fiducial Marker: implications for external beam treatment of prostate cancer

Purpose: A novel Platinum/Iridium implantable soft tissue marker is being developed for radiographic and/or radioactive target localization to optimize external beam radiation therapy. In this study, non-radioactive and radioactive versions of the marker were implanted in the prostate of 1 dog and the liver of 19 rabbits to assess marker stability and visibility. **Method and Materials:** In the canine prostate and each rabbit liver, 3-4m arkers were implanted. A total of 34 non-radioactive markers and 35 radioactive markers were implanted. Stability was assessed by measuring intermarker distance (IMD) variation relative to IMDs measured at the time of implantation. IMDs were measured on a weekly basis for 3 months in the dog and a biweekly basis for 2-4 weeks in the rabbits. Ultrasound and X-ray imaging were performed on all subjects. CT and MRI were performed on the dog. **Results:** No differences in marker migration or visibility were found between non-radioactive and radioactive versions of the marker. A total of 139 IMD variation measurements made in 1 dog and 16 rabbits had a mean absolute variation (+/- SD) of 1.1 +/- 1.1mm. These IMD variations are consistent with those reported in the literature due to random organ deformation. The markers were visible, identifiable, and induced minimal or no image artifacts in all tested imaging modalities. **Conclusion:** The observed stability of the markers from the time of implantation suggests that these markers may allow the immediate onset of treatment without the 1-2 week post-implantation stabilization period required with most implanted fiducials. The markers were found to be compatible with all common medical imaging modalities. With respect to marker stability and visibility these implanted fiducials are appropriate for target positioning in the radiation treatment of cancers of the prostate and other mobile organs. **Conflict of Interest:** Research sponsored by Navotek Medical Ltd.