Permanent ^{125}I prostate implants : post-implant dosimetry based on images acquired on a single day can only be approximate.

It has been recently suggested that for ^{125}I permanent prostate implant post-implant dosimetry should be performed with images acquired about 30 days post-implantation. The rationale is that by that time, prostate edema is most likely resolved and a stable volume and seed distribution are available for dosimetry. The objective of this study is to compare post-implant dosimetry performed with the fixed volume obtained at 30 days with dosimetry considering a volume varying with respect to time.

Information on edema has been gathered on ten patients who have been followed for a period of 30 to 180 days post-implant. Based on these observations, a few edema scenarios were elaborated. The scenarios were applied to a real case along with simulated migration. A special dosimetry taking into account the volume variation with time was calculated and compared to the usual fixed-volume post-implant dosimetry. Differences observed between computing methods ranged from +5 to –15 points.

Unless by coincidence, it is not possible to perform an exact post-implant dosimetry based on a fixed volume when in fact the volume varies with time. If edema has resolved by the time images are acquired, then the fixed-volume method will overestimate coverage. If edema has not resolved an underestimation is likely to be attained. A more accurate but less practical post-implant dosimetry could be obtained by using a series of images spread over a period of time.