Purpose:

The daily shifts of prostate gland have been intensively reported in literatures. However, few papers reported daily shifts of prostate bed due to several practical difficulties (e.g. limited soft tissue contrast in MVCT and CBCT and significant deformation of prostate cavity). We have routinely performed IGRT for both prostate gland and bed with ct-on-rails, and the superior image quality allows us not only to differentiate both bony anatomy and soft tissue contrast of prostate gland and bed. In this study, we investigated if the shift of prostate bed is significant difference from that of prostate gland.

Methods:

we reviewed shift data of 50 prostate gland patients who underwent 43 fractions and 22 patients of prostatectomy underwent 37 fractions. In total 2150 CT scans were reviewed for prostate gland and 814 scans for prostate bed.

Results:

Of the reviewed 814 CT images from 22 prostate bed patients, the standard deviation of shift was found to be 5.9 mm in AP direction (ranges from -22.4mm to 22mm), 3.2mm in SI direction (ranges from -14mm to 14mm), and 4.1mm in lateral direction (ranges from -15mm to 22mm). Of the 2150 CT images of prostate gland from 50 patients, the standard deviation of the shift was found to be 5.4 mm in AP direction (-20mm to 18 mm), 5.0mm in SI direction (-26mm to 20mm), and 4.3mm in lateral direction (range from-15 to 30mm). F tests of systematic /random shift distribution in three orthogonal directions between prostate gland and prostate bed were subsequently performed, it was found that the systematic shift in SI direction for prostate bed is smaller than for prostate gland (p=0.003).

Conclusions:

Our result suggests no significant difference existing in shift between prostate bed and gland. Therefore strategies for daily prostate gland motion can be directly applied to prostate bed.