

## **Abstract**

**Purpose:** This study aimed to compare the interobserver variabilities in magnetic resonance imaging (MRI)/computed tomography (CT) fusion image-based post-implant dosimetry of permanent prostate brachytherapy (PPB) between 1.5-T and 3.0-T MRI. **Materials:** The study included 60 patients. Of these patients, 30 underwent 1.5-T MRI and CT 30 days after seed implantation (1.5-T group) and 30 underwent 3.0-T MRI and CT 30 days after seed implantation (3.0-T group). All patients received PPB alone. Two radiation oncologists performed MRI/CT fusion image-based post-implant dosimetry, and the interobserver variabilities of dose–volume histogram (DVH) parameters (prostate D90, prostate V100, prostate V150, urethral D5, and urethral V150) were retrospectively estimated using the paired Student's *t* test and Pearson's correlation coefficient. **Results:** The Pearson's correlation coefficients of all DVH parameters were higher in the 3.0-T group than in the 1.5-T group (1.5-T vs. 3.0-T: prostate D90, 0.65 vs. 0.93; prostate V100, 0.62 vs. 0.82; prostate V150, 0.97 vs. 0.98; urethral D5, 0.92 vs. 0.93; and urethral V150, 0.88 vs. 0.93). In the paired Student's *t* test, no significant differences were observed in all DVH parameters between the two radiation oncologists in the 3.0-T group ( $0.068 \leq p \leq 0.842$ ); however, significant differences were observed in prostate D90 ( $p = 0.004$ ), prostate V100 ( $p = 0.011$ ), and prostate V150 ( $p = 0.002$ ) between the oncologists in the 1.5-T group. **Conclusions:** The interobserver variability of DVH parameters in the MRI/CT fusion image-based post-implant dosimetry analysis of brachytherapy was lower with 3.0-T MRI than with 1.5-T MRI.

**KEYWORDS:** Prostate brachytherapy, contouring variability, magnetic resonance imaging, computed tomography, MRI/CT fusion, post-implant dosimetry