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学位論文の題名	<p>Comparison of intensity-modulated radiotherapy with the 5-field technique, helical tomotherapy and volumetric modulated arc therapy for localized prostate cancer (限局性前立腺癌に対する 5-field、tomotherapy、VMAT を使用した IMRT の治療成績の比較)</p> <p>Journal of Radiation Research 63(4):666-674, 2022</p>
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ABSTRACT

Intensity-modulated radiotherapy (IMRT) is an established treatment for prostate cancer. The outcomes of three methods of IMRT for localized prostate cancer were evaluated. Between 2010 and 2018, 308 D'Amico intermediate- or high-risk patients were treated with 2.2-Gy daily fractions to a total dose of 74.8 Gy in combination with hormonal therapy. Overall, 165 patients were treated with 5-field IMRT using a sliding window technique, 66 were then treated with helical tomotherapy, and 77 were treated with volumetric modulated arc therapy (VMAT). The median age of patients was 71 years. The median follow-up period was 75 months. Five-year overall survival and biochemical or clinical failure-free survival rates were 95.5 and 91.6% in the 5-field IMRT group, 95.1 and 90.3% in the tomotherapy group, and 93.0 and 88.6% in the VMAT group, respectively, with no significant differences among the three groups. The 5-year cumulative incidence of late grade ≥ 2 genitourinary and gastrointestinal toxicities were 7.3 and 6.2%, respectively, for all patients. Late grade ≥ 2 gastrointestinal toxicities were less frequent in patients undergoing VMAT (0%) than in patients undergoing 5-field IMRT (7.3%) and those undergoing tomotherapy (11%) ($P = 0.025$), and this finding appeared to be correlated with the better rectal DVH parameters in patients undergoing VMAT. Other toxicities did not differ significantly among the three groups, although bladder dose-volume parameters were slightly worse in the tomotherapy group than in the other groups. Despite differences in the IMRT delivery methods, X-ray energies, and daily registration methods, all modalities may be used as IMRT for localized prostate cancer.