

Clinical Investigation

Prospective Study Delivering Simultaneous Integrated High-dose Tumor Boost (≤ 70 Gy) With Image Guided Adaptive Radiation Therapy for Radical Treatment of Localized Muscle-Invasive Bladder Cancer



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Summary

The present prospective study has demonstrated the first experience of tumor dose escalation ≤ 70 Gy with intensity modulated radiation therapy delivered with a plan of the day approach. It achieves appropriate tumor boost coverage and provides an opportunity for normal

Purpose: Image guided adaptive radiation therapy offers individualized solutions to improve target coverage and reduce normal tissue irradiation, allowing the opportunity to increase the radiation tumor dose and spare normal bladder tissue.

Methods and Materials: A library of 3 intensity modulated radiation therapy plans were created (small, medium, and large) from planning computed tomography (CT) scans performed at 30 and 60 minutes; treating the whole bladder to 52 Gy and the tumor to 70 Gy in 32 fractions. A “plan of the day” approach was used for treatment delivery. A post-treatment cone beam CT (CBCT) scan was acquired weekly to assess intrafraction filling and coverage.

Results: A total of 18 patients completed treatment to 70 Gy. The plan and treatment for 1 patient was to 68 Gy. Also, 1 patient’s plan was to 70 Gy but the patient was treated to a total dose of 65.6 Gy because dose-limiting toxicity occurred before dose

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