Results of 15 Gy HDR-BT boost plus EBRT in intermediate-risk prostate cancer: Analysis of over 500 patients

Martell K, Mendez LC, Chung HT, Tseng CL, Alayed Y, Cheung P, Liu S, Vesprini D, Chu W, Wronski M, Szumacher E, Ravi A, Loblaw A1, Morton G

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What was your motivation for initiating this study?

There are many dose/fractionation schedules used for combined modality treatment in intermediate-risk prostate cancer. We initially reported favourable outcomes from a phase II clinical trial that used single 15Gy high-dose-rate brachytherapy boost followed by modestly hypofractionated external-beam radiotherapy (37.5Gy in 15 fractions). This treatment regimen has been widely adopted due to its high efficacy, low toxicity and convenience compared with other fractionation schedules. Our purpose in initiating this study was to provide further clinical evidence supporting its use in an unselected patient population being offered this treatment as routine standard-of-care outside the confines of a formal clinical trial. The study therefore provides data on real-world experience and expectations.

What were the main challenges during the work?

A major challenge with any retrospective study is ensuring the integrity of the data. This study was no exception. Over the study period, the local treatment planning and electronic medical record systems had changed. Reconciling these records was at times difficult and time-consuming. Of particular note, we found ourselves reviewing hundreds of scanned medical records to retrieve pathologic, dosimetric and follow-up information for patients treated earlier in the programme.

What are the most important findings of your study?

The biochemical control rates when using high-dose-rate brachytherapy combined with modestly hypofractionated external-beam radiotherapy are excellent (91% five-year freedom from biochemical failure). There was a slight difference in control rates between patients with favourable (94% at five years) and unfavourable (89% at five years) intermediate-risk disease. This translated to excellent five-year metastasis-free survival (97%) and cause-specific survival (100%) rates. These findings were produced with only 3% of patients with favourable and 21% of patients with unfavourable disease receiving androgen-deprivation therapy. Finally, the treatment was very well tolerated, with no patients experiencing common terminology criteria for adverse events (CTCAE) grade 4 toxicity and only 1% and 4% of patients experiencing grade 3 acute and late toxicity, respectively. Of particular note was a late urethral stricture rate of 0.8%, significantly lower than in most other series. We hypothesise that use of real-time intra-operative TRUS-based planning, which prevented catheter displacement and enabled accurate delineation of the apex, may have been responsible for such a low rate.

What are the implications of this research?

The use of single-fraction high-dose-rate brachytherapy followed by external-beam radiotherapy for prostate cancer is becoming more widespread within the prostate brachytherapy community. This research provides further evidence to support this practice by providing real-world-outcome data. It will give centres that adopt this regimen a standard with which to compare their own practices and will give patients reliable outcome data on which to compare single-fraction high-dose-rate brachytherapy boost with other treatment modalities. Finally, we anticipate that, given the favourable outcomes represented by this study, the popularity of single-fraction high-dose-rate brachytherapy and modestly hypofractionated external-beam radiotherapy will continue to increase. This will save patients with intermediate-risk prostate cancer from undergoing multiple brachytherapy

procedures, and it provides an exciting opportunity to reduce the number of external-beam radiotherapy treatments they require.

Kevin Martell
Department of Radiation Oncology
University of Toronto Canada; Sunnybrook Health Sciences Centre
Toronto, Canada

Gerard Morton
Department of Radiation Oncology
University of Toronto Canada; Sunnybrook Health Sciences Centre
Toronto, Canada