

Oncological outcomes of men with low and intermediate risk prostate cancer following treatment with low dose rate prostate brachytherapy monotherapy using live intraoperative dosimetry planning and an automated needle navigation delivery system, with a median follow up of 11.8 years

Yaxley WJ^{1,2}, Mackean J^{3,4}, Desai D⁵, Tsang G^{3,4}, Dixon J⁶, Samaratunga H⁷, Delahunt B⁸, Egevad L⁹, Gardiner RA², Yaxley JW^{2,4,6,10}

1. Queen Elizabeth II Jubilee Hospital, Brisbane, Australia
2. The University of Queensland, School of Medicine, Brisbane, Australia
3. Genesis Cancer Care, Brisbane, Australia
4. Wesley Hospital, Brisbane, Australia
5. Toowoomba Hospital, Toowoomba, Australia
6. Wesley Urology Clinic, Wesley Hospital, Brisbane, Australia
7. Aquesta Uro-pathology, Brisbane, Australia
8. Department of Pathology and Molecular Medicine, Wellington School of Medicine and Health Sciences, University of Otago, Wellington, New Zealand.
9. Department of Oncology and Pathology, Karolinska Institutet, Stockholm, Sweden.
10. Royal Brisbane and Women's Hospital, Brisbane, Australia

Introduction:

Our aim was to examine the long-term oncological outcomes of low dose rate prostate brachytherapy (LDRBT) monotherapy using live intraoperative dosimetry planning and an automated needle navigation delivery system for treatment of men with low and intermediate risk prostate cancer. Data on long term oncological outcomes following LDRBT is limited in medical literature.

Methods:

A prospective database of 400 consecutive patients who underwent LDRBT between July 2003 and June 2015 was retrospectively reviewed to assess oncological outcomes including biochemical progression based on the Phoenix definition, and also a definition of PSA >0.2.

Results:

Minimum patient follow-up was 5.5 years. Median follow-up of the entire cohort was 11.8 years. Gleason score 4+3 was identified in 14% (56/400), Gleason 3+4 in 44.25% (177/400) and Gleason 3+3 in 41.75% (167/400). The median PSA was 6.1 (0.9-17) and the median Gleason score was 3+4. The bNED based on the Phoenix definition was 85.8% (343/400). A Kaplan-Meier curve for biochemical failure post LDRBT based on the Phoenix definition is demonstrated in Figure 1. The bNED using a 'surgical' definition of PSA <0.2 was 71% (284/400). Of the 297 men followed for > 10 years, prostate cancer specific survival was 98% (291/297).

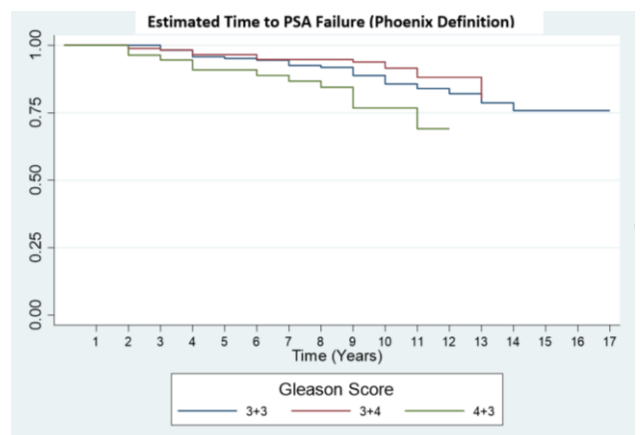


Figure 1: Kaplan-Meier curve for biochemical failure post LDR brachytherapy

Conclusion:

LDRBT using live intraoperative dosimetry techniques and a robot automated system for delivery of the brachytherapy seeds is associated with excellent prostate cancer specific survival with a median follow up of 11.8 years. There is also pleasing bNED using both the Phoenix definition and the 'surgical' definition of PSA <0.2.