A 13 YEAR EXPERIENCE OF PROSTATE HDR BRACHYTHERAPY: ANALYSIS OF OUTCOME AND TOXICITY

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Aim

To evaluate clinical outcomes, toxicity and dosimetric aspects in patients affected by localized prostate cancer treated with 3D conformal high dose rate (HDR) brachytherapy (BRT) as monotherapy clinical outcomes, toxicity and dosimetric aspects in patients affected by localized prostate cancer treated with 3D conformal high dose rate (HDR) brachytherapy (BRT) as monotherapy (1,2,3).

Materials and Methods

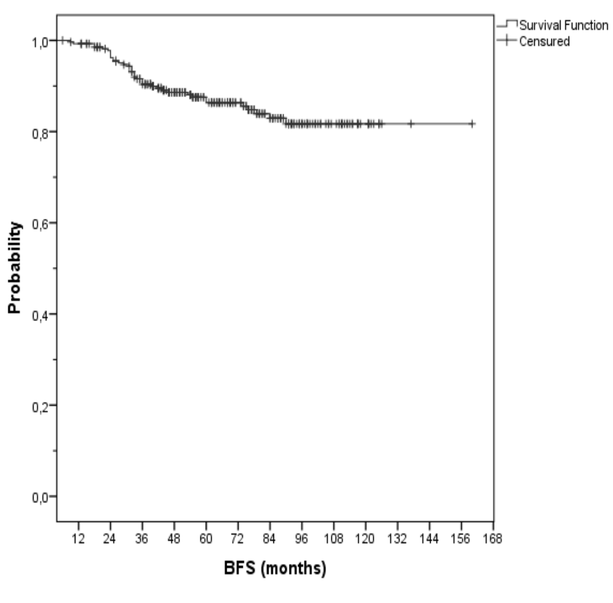
From March 2004 to October 2017, 277 patients with prostate cancer (T1c-T2cN0M0) were treated in our institute using 3D conformal HDR brachytherapy as monotherapy with a temporary implant. The mean age was 67 years with a range of 47-81 years. Of them, 116 patients were low risk, 145 at intermediate risk, and 15 at high risk. Overall, 154 patients received 38 Gy in 4 fractions (2 fractions/day in 2 days), 36 patients received 27 Gy in 2 fractions (1 fraction/day), and 87 patients received 19 Gy in 1 fraction. The treatment plan was elaborated using CT based software to perform 3D conformal dose planning aided by an inverse planning algorithm using these dosimetric constraints for organ at risk (OAR): dose received by 2 cc of rectum (D2cc) <75% of prescription dose (PD); D2cc of bladder <80% PD. For the urethra: the dose received by 1% of volume (D1%) <115% PD and D10% <110% PD. The prescription for the target was D90% >95% PD.

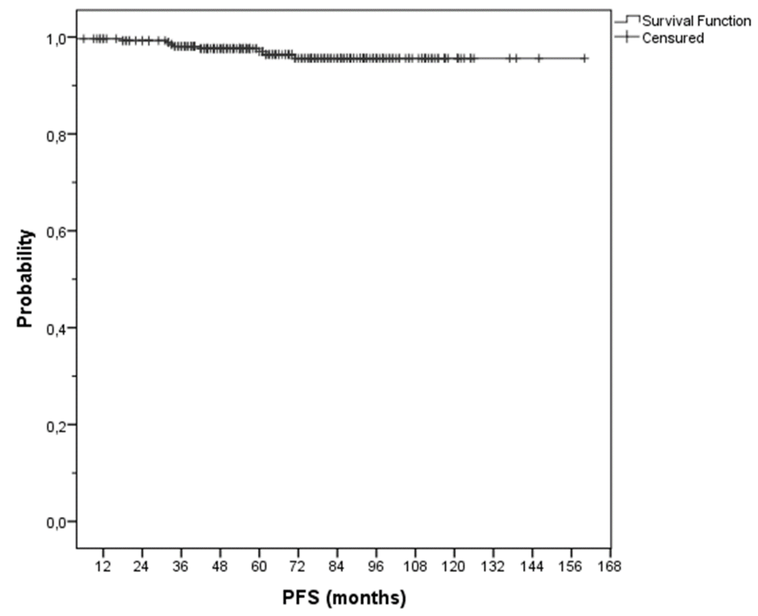
Table 1 Patient and disease characteristics

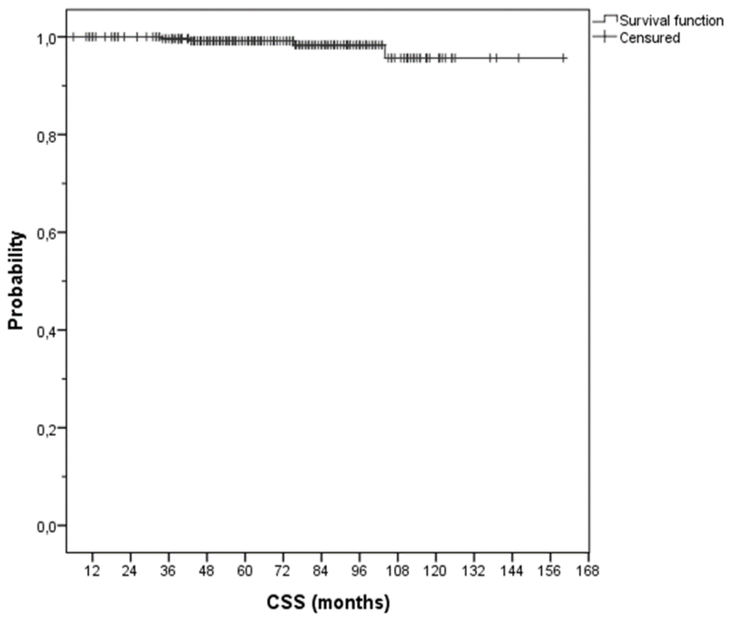
Characteristic	No	%
All patients	277	
Age (y) Median Range	 **67** **47-81**	
Gleason score ≤ 6 =7 = 8	 178 92 7	 64.3 33.2 2.5
iPSA (ng/mL) Median Range	 7.85 1.8-59.5	
T stage (DRE or image based) T1 328 (73) T2a 104 (23) T2b 14 (3) T2c	 215 53 6 3	
NADT Yes No	 94 183	 33.9 66.1
NCCN risk group Low Intermediate High	 145 116 16	 52 42 6
Positive biopsy cores (%) Median Range	 27 1-100	
HDR-BT dose 19-20 Gy/1 fraction 27 Gy/2 fractions 38 Gy/4 fractions	 95 28 154	 34.3 10.1 55.6
ADT Yes 42 (9) No 406 (91)	 6 271	 2.2 97.8
PSA 3 months after BT (ng/mL) Median Range	 0 0-9	

Results

After a median follow-up of 6 years (range=6-160 months) overall survival and cancer-specific survival rates were 90% and 97% respectively. Biochemical disease-free rate resulted 78%; for low and intermediate risk biochemical free disease rate was 85%, whereas for high risk disease was 62%. Regarding dosimetric aspects, we obtained satisfactory dose distributions in terms of planning target volume (PTV) coverage (D90%>100% PD), with a strict respect of OAR constraints. Genitourinary (GU) and gastrointestinal (GI) acute toxicity > G2 was observed in 28% of patients. Late toxicity > G2 was very low (2.2 %), while only 3 patients reported G3 late toxicity (0.8%), which consisted in GU toxicity.







Conclusions: With a median follow-up of 6 years, HDR BRT was shown as a valid treatment modality for patients with localized prostate cancer in terms of both biochemical and local control, as well as toxicity. Future studies can be addressed to evaluate the quality of life in this subset of patients.

References

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