CLINICAL OUTCOMES AND PROGNOSTIC FACTORS IN PATIENTS AFFECTED BY LOCALIZED PROSTATE CANCER TREATED HDR BRACHYTHERAPY

Carlo Pietro Soatti[1], Durim Delishaj[1], Cristina Frigerio[2], Romerai D'amico[1], Francesco Bonsignore[2], Ilaria Costanza Fumagalli[3], Giuseppe De Nobili[1], Alessandra Cocchi[1], Alessandra Vola[1], Giulia Sangalli[2], Fausto Declich[2] and Alessandro Colombo[1]

[1] Department of Radiation Oncology, ASST LECCO, Lecco, Italy;
[2]Medical Physics Unit, ASST LECCO, Lecco, Italy;
[3] Department of Radiation Oncology, University of Milano-Bicocca, Milan, Italy

Aim

To evaluate clinical outcomes and prognostic factors in patients affected by localized prostate cancer treated with 3D Conformal high dose rate (HDR) brachytherapy (BT) as monotherapy (1, 2, 3).

Materials and Methods

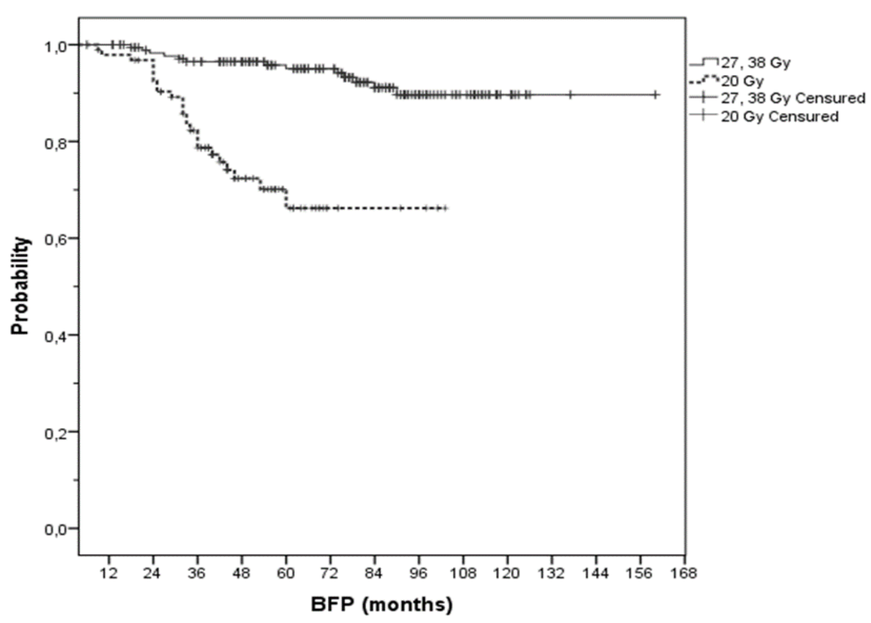
Between March 2004 and October 2017, 277 patients with localized prostate cancer (T1c-T2cN0M0) were treated in our institute using 3D conformal HDR BT with a temporary implant. The mean age was 67 years (range=47-81). Of them, 166 patients were low risk, 145 intermediate risk, and 15 high risk. Overall, 154 patients received 38 Gy in 4 fractions (2 fractions/day in 2 days), 36 patients received 27 Gy in two fractions (1 fraction/day) and 87 patients received 19 Gy in one fraction. The treatment plan was elaborated using computed tomography (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 2cc 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

Overall survival and cancer specific survival rates were 90% and 97% respectively. The median follow-up was 6 years (range=6-160 months) and biochemical-free disease (BFD) rate was 78%. Patients with low and intermediate risk disease had one advantage in terms of BFD compared to patients with high risk disease (p=0.04, HR=2.453, 95%CI=1.3113-4.543). Also, in patients with initial prostate-specific antigen (iPSA)<9.5 ng/ml there was one advantage in terms of BFD compared to patients with iPSA≥9.5 (p=0.022, HR=2.042, 95%CI=1.123-4.081). Moreover, patients who reached a nadir of PSA <0.2 ng/ml and had a PSA value<0.5 ng/ml 3 months after BT treatment had a benefit in terms BFD (p=0.003 and p=0.001, respectively). In the same way, patients who reached the nadir within 12 months after BT treatment reported a statistically significant advantage in terms of biochemical recurrence (p=0.01). Patients treated with 38 Gy in 4 fractions or 27 Gy in 2 fractions showed a benefit in terms of BFD compared to patients treated with a total dose of 19 Gy in one fraction (p=0.0001, HR=6.813, 95%CI=3.833-11.981). Finally, patients with low-intermediate risk disease had an advantage in terms of OS compared to patients with high risk (p=0.034). There were not statistically significant differences regarding the analyzed risk factors and overall survival.



Conclusions: High risk disease, iPSA<9.5 ng/ml, nadir of PSA<0.2 ng/ml, PSA<0.5 ng/ml three months after BT, NADIR reached within 12 months after BT, and total prescribed doses were prognostic factors regarding bochemical recurrences. High risk disease was the only prognostic factor for overall survival.

References
1 Bachand F, Martin AG, Beaulieu L, Harel F and Vigneault E: An eight-year experience of HDR brachytherapy boost for localized prostate cancer: biopsy and PSA outcome. Int J Radiat Oncol Biol Phys 73: 679-684, 2009. PMID: 18963537. DOI: 10.1016/j.ijrobp.2008.05.003
2 Chin J, Rumble RB, Kollmeier M, Heath E, Efstathiou J, Dorff T, Berman B, Feifer A, Jacques A and Loblaw DA: Brachytherapy for patients with prostate cancer: American Society of Clinical Oncology/Cancer Care Ontario Joint Guideline Update. J Clin Oncol 35: 1737-1743, 2017. PMID: 28346805. DOI: 10.1200/JCO.2016.72.0466
3 Yaxley JW, Lah K, Yaxley JP, Gardiner RA, Samaratunga H and MacKean J: Long-term outcomes of high-dose-rate brachytherapy for intermediate- and high-risk prostate cancer with a median follow-up of 10 years. BJU Int 120: 56-60, 2017. PMID: 27628127. DOI: 10.1111/bju.13659

Poster No: 117
XXIX Congresso Nazionale SIURO, 11/04/2019 -13/04/2019, Bologna, Italy,
Contacts; cp.soatti@asst-lecco.it delishaj@hotmail.com