PO-1049
HDD brachytherapy combined to EBRT for prostate cancer: analysis of toxicities and PSA bounce of a phase II trial
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Purpose/Objective: To assess acute and late toxicities and report the frequency and timing of the PSA bounce in intermediate-risk prostate cancer patients treated with brachytherapy and hypofractionated external beam radiotherapy (EBRT) combined with short course androgen deprivation therapy (ADT).

Materials and Methods: Between August 2003 and September 2007, 51 patients with intermediate-risk prostate cancer were enrolled in a dose escalation phase II protocol (BRP-1 trial). The treatment regimen applied was as follows: patients received six months of ADT (three months neoadjuvantly and three months concurrently) and underwent high-dose-rate (HDR) Ir192 prostate brachytherapy, for a prescribed dose of 19.5Gy (three fractions of 6.5Gy each); followed one week later, by hypofractionated EBRT at a dose of 50Gy in 20 fractions. Patients were assessed one month post-treatment, every three to six months for the first five years and annually thereafter. AP5, testosterone and complete blood count were taken on each visit. Gastrointestinal (GI), genitourinary (GU) and sexual toxicities were assessed according to the RTOG toxicity scoring criteria. Patients also completed the Expanded Prostate Cancer Index Composite (EPIC) questionnaires for quality of life every 6 months.

Results: Median age was 68.5 years (range 51-83 years). At diagnosis, 31.8% of patients had grade 2 or higher for GU symptoms according to the RTOG scoring criteria, no one had grade 2 GI symptoms and 50% had grade 2 or higher erectile dysfunction. Median follow-up was 80 months (range 4.9-132 months). Rates of grade 2 and higher GU toxicity at 1, 12 and 60 months were 33.8%, 12.8% and 23.5%, respectively. No grade 2 or higher GI toxicities were reported at 1 and 12 months and a rate of 5.9% was observed at 60 months. Grade 2 and 3 erectile dysfunction at 1, 12 and 60 months was reported in 21.1%, 19.2% and 16.1% and 91.7%, 57.2% and 71% of patients respectively. No grade 4 toxicity was reported. PSA bounce was observed in 33.3% of patients at a median of 12 months (range 3-42 months) and the median time to PSA bounce was observed in 33.3% of patients at a median of 12 months (range 3-42 months) and the median time to PSA bounce was observed in 33.3% of patients respectively. No grade 4 toxicity was reported.

Conclusions: Acute and late GU and GI toxicities were acceptable for patients with intermediate-risk prostate cancer treated with HDR brachytherapy and hypofractionated EBRT combined to short course ADT. Rates of erectile dysfunction were probably affected by the use of a short course of ADT. PSA bounces are common, and occur up to 42 months in our cohort.

PO-1049
A single centre experience of dosimetric outcomes in LDR prostate brachytherapy with 1-125 seeds prescribed to 160Gy
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Purpose/Objective: Low dose rate (LDR) brachytherapy is accepted as a treatment option for low risk prostate cancer producing excellent long term outcomes. The GEC-ESTRO guidelines recommend a 100% isodose prescription of 145Gy for Iodine-125 implantable seeds. In our practice we prescribe to 160Gy to low and intermediate risk cases, as increasing dose has been associated with improved outcomes. We analysed our implant and post-implant dosimetric parameters, relative to the current GEC-ESTRO guidelines.

Materials and Methods: A single operator cohort of patients was selected to control inter-operator variability. Data for patients in our Trust is prospectively collected and compiled into the ProBrachy European and Royal Berkshire local database. Median values were used to assess the performance of the cohort. Statistical analysis was performed on SPSS v22.

Results:

A total of 95 patients treated with low dose rate brachytherapy were identified. Patient characteristics and tumour stage are summarised below. Median prostate volume implanted was 35.81cc (Range 18.3-83.8cc). Pre-implant ultrasound volume assessments showed excellent correlation with the implant ultrasound volumes and post implant CT (Pearson’s r = 0.926 and 0.93, respectively).

<table>
<thead>
<tr>
<th>V100 (CTV)</th>
<th>D90 (CTV) %</th>
<th>D10</th>
<th>V50 (CTV) %</th>
<th>D2cc Rectum</th>
<th>D150 Urethra</th>
<th>D130 Urethra</th>
</tr>
</thead>
<tbody>
<tr>
<td>95%</td>
<td>≥100%</td>
<td></td>
<td>50%</td>
<td>≥145Gy</td>
<td>≥150%</td>
<td>≥130%</td>
</tr>
<tr>
<td>145Gy</td>
<td>100%</td>
<td>217.5 Gy</td>
<td>≥145Gy</td>
<td>214.59 Gy</td>
<td>188.5 Gy</td>
<td>188.5 Gy</td>
</tr>
<tr>
<td>160Gy</td>
<td>100%</td>
<td>240 Gy</td>
<td>160Gy</td>
<td>202.83 Gy</td>
<td>208 Gy</td>
<td>208 Gy</td>
</tr>
<tr>
<td>Implant (median)</td>
<td>98%</td>
<td>95%</td>
<td>Implant (median)</td>
<td>186.99 Gy</td>
<td>94.425 Gy</td>
<td>193.7 Gy</td>
</tr>
</tbody>
</table>
The range of doses achieved for D90 Rectum was 52.46 Gy to 138.27 Gy. 85% of cases achieved D90 Urethra of less than 217.5Gy, whilst 100% achieved doses of less than 240 Gy. The range of doses for D90 Urethra was 172.08 Gy to 222.35 Gy. 64% of cases received doses greater than 188.5Gy but only 7.4% of cases received doses greater than 208 Gy. Only 1 patient required re-catheterisation post procedure.

Conclusions: The median dosimetric parameters ascribed to a 145Gy prescription dose were achieved for all GEC-ESTRO described organs at risk, except for the secondary OAR parameter of D90 Urethra, using a prescription dose of 160Gy. The low rectal doses are noteworthy as is the low rate of re-catheterisation. This indicates that 160Gy can be safely delivered which may in turn improve outcomes.

PO-1050
Comparison of two different types of stranded 125-I seeds for permanent prostate brachytherapy
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Purpose/Objective: To evaluate two different types of stranded seeds in permanent prostate brachytherapy. In the first group we used strands with a fixed sequence of seeds and spacers, in the second group we could implant strands with a variable sequence of seeds and spacers.

Materials and Methods: From 2007 to 2014 we treated a total of 110 low-risk prostate cancer patients with either the fixed (IsoCord®, Eckert & Ziegler Bebig, n=74) or the variable spacing (Quicklink®, C.R. Bard, n=36) system. Median patient age was 65.5 years. All patients were treated by the same team of radiation oncologist, urologist and physicist. Treatment planning parameters were compared at seed implantation and at post-planning 4 weeks later. Toxicities and quality of life were evaluated according to CTCAE v4 and the EORTC QLQ-C30 and PR-25 questionnaires. To evaluate obstructive problems we used the IPSS scoring system.

Results: Mean prostate volumes were 30.4±11ccm and 36.9±11ccm (p=0.004). A mean of 52 vs 59 Seeds per patient were implanted (p=0.001). At implantation values for D90 (191.9 vs. 179.9Gy; p=0.004), V100 (99.1 vs. 97.6%; p<0.001), V150 (78.5 vs. 70.5%; p<0.001) and V200 (45.1 vs. 37.9%; p<0.001) were significantly different. Also D1 for urethra was less for the group with variable spacing (225.9 vs. 206.8Gy; p<0.001). We observed significant differences at post-planning in the following DVH parameters: D90 (165.7 vs. 171.9Gy; p=0.008) and V100 (94.6 vs. 96.0; p<0.001). The reduction in D90 values were significantly greater for the fixed system (13.7% vs. 4.6%; p<0.001). Homogeneity index was significantly different at implantation (20.8 vs. 27.2%) but not at post planning (24.8 vs. 25.0%). There were no significant changes in rectal V100 and prostate V150 and V200. Evaluation of toxicities, IPSS scores and comparison of quality of life parameters is still ongoing and will be presented at the conference.

Conclusions: Using the stranded seed system with variable spacing we could achieve a reduced dose to the urethra at implantation and observed more stable values for prostate D90 at post-planning dosimetry.