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Dosimetric Consequences and Acute Toxicity Following Perirectal Hydrogel Spacer Injection During Permanent Prostate Brachytherapy

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Conclusion: V150: 45% vs 48%, D90: 106% vs 106%, respectively. There were no statistically significant differences on prostate brachytherapy without any adverse effect on acute toxicity or prostate health related quality of life (HRQOL) in the prostate and rectum. This was performed immediately after the implant following hydrodissection of Denonvilliers’ fascia with 1-3 cc of radiopaque IV contrast. Postop day 0 CT-based dosimetry was compared between patients with and without hydrogel spacer to evaluate for differences in rectal and prostate dosimetry using a two-tailed unequal variance t-test.

Materials/Methods: A consecutive series of 80 patients implanted with 1-125 permanent brachytherapy seeds between August 2013 and October 2014 were evaluated. The most recent 40 patients also underwent a single transperineal injection of polyethylene glycol (5 cc) in the space between the prostate and rectum. This was performed immediately after the implant following hydrodissection of Denonvilliers’ fascia with 1-3 cc of radiopaque IV contrast. Postop day 0 CT-based dosimetry was compared between patients with and without hydrogel spacer to evaluate for differences in rectal and prostate dosimetry using a two-tailed unequal variance t-test. There were no differences between baseline factors with regards to mean age (63 years), pre-implant gland size (30 cc), number of seeds implanted (64), or total activity (25 mCi). There were no acute genito-urinary or rectal toxicities within the first 3 months that could be attributed to the hydrogel rectal spacer. Comparing patients with and without hydrogel, the mean separation between the prostate and rectum was 14 mm ± 4 mm versus 6 mm ± 3 mm (P<0.0001), respectively. The mean rectal doses to 1 cc, 2 cc, and 5 cc relative to prescription dose were 41% vs 61% (P<0.0001), 44% vs 50% (P<0.0001), and 26% vs 32% (P<0.0009) respectively. There were no statistically significant differences on prostate coverage with or without a hydrogel rectal spacer with V100: 92% vs 91%, V150: 45% vs 48%, D90: 106% vs 106%, respectively.

Results: There were no differences between baseline factors with regards to mean age (63 years), pre-implant gland size (30 cc), number of seeds implanted (64), or total activity (25 mCi). There were no acute genito-urinary or rectal toxicities within the first 3 months that could be attributed to the hydrogel rectal spacer. Comparing patients with and without hydrogel, the mean separation between the prostate and rectum was 14 mm ± 4 mm versus 6 mm ± 3 mm (P<0.0001), respectively. The mean rectal doses to 1 cc, 2 cc, and 5 cc relative to prescription dose were 41% vs 61% (P<0.0001), 44% vs 50% (P<0.0001), and 26% vs 32% (P<0.0009) respectively. There were no statistically significant differences on prostate coverage with or without a hydrogel rectal spacer with V100: 92% vs 91%, V150: 45% vs 48%, D90: 106% vs 106%, respectively.

Conclusion: The use of PEG hydrogel significantly and consistently reduced the rectal exposure of radiation in patients undergoing permanent brachytherapy without any adverse effect on acute toxicity or prostate gland coverage.


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Prospective Patient-Reported Outcomes After Stereotactic Body Radiation Therapy (SBRT) for Prostate Cancer: Longitudinal Predictors of Potency Preservation

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Purpose/Objective(s): Given the rapid adoption of stereotactic body radiation therapy (SBRT), it is unclear if prior models using conventionally fractionated radiation therapy adequately predict sexual function given the swift diffusion of SBRT. It is important to study the factors that affect potency and sexual function in men undergoing SBRT.

Materials/Methods: Between January 2008 and September 2014, 720 men were consecutively treated with SBRT at a single institution. Health related quality of life (HRQOL) data were collected prospectively via the Expanded Prostate Cancer Index Composite (EPIC-26). Patients were treated with 35-36.25 Gy in 5 fractions (Dose level 1) or 19.5 Gy in 3 fractions in combination with supplemental radiation therapy to 45-50.4 Gy in 1.8 Gy fractions (Dose level 2). Dose level 2 and neoadjuvant androgen deprivation therapy (ADT) for 3-6 months were given at the discretion of the treating physician generally for higher risk patients. Potency was defined as the patient reported answer of having erections “firm enough for intercourse” irrespective of using sexual aids. Potency was assessed serially at baseline, 3-, 6-, 12-, 24-, and 36-months. Predictors of potency were assessed using univariable and multivariable logistical regression analyses.

Results: The median follow-up of the cohort was 3-years. The mean age was 69 years old, and 24%, 57%, and 19% were low, intermediate, and high risk by NCCN, respectively. For patients who were potent at baseline (n = 328), 36-months post-SBRT 76% maintained a high level of sexual HRQOL (score of ≥75 out of 100) and 61% retained potency. Multivariate logistic regression analyses for potency preservation are detailed in Table 1. Age and pretreatment sexual HRQOL predicted long-term potency at all-time points. Use of ADT was significantly associated with a decline in potency only at 3- and 6-months post-SBRT. Higher dose (Dose level 2) predicted for worse long-term potency beginning 12-months through 36-months post-SBRT.

Conclusion: Multiple factors predict sexual potency following SBRT treatment for prostate cancer. At all-time points, younger men and those with high baseline sexual HRQOL are more likely to retain potency. In contrast, short-term ADT transiently impacts potency up to 6-months post-SBRT, while the late effects of dose escalation impact potency 12-months and beyond without signs of improvement for at least 3-years after SBRT. SBRT dose escalation beyond 36.25 Gy in 5 fractions should be studied further to evaluate the impact on long-term sexual function.

Abstract 2552: Table 1. Multivariate Model For Maintenance of Potency

<table>
<thead>
<tr>
<th>Time Point</th>
<th>Age (per year)</th>
<th>Dose Escalation</th>
<th>Potency (per quartile)</th>
<th>Use of ADT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 mo</td>
<td>0.97</td>
<td>OR 0.28</td>
<td>0.90</td>
<td>NS</td>
</tr>
<tr>
<td>6 mo</td>
<td>0.96</td>
<td>OR 0.28</td>
<td>0.94</td>
<td>NS</td>
</tr>
<tr>
<td>12 mo</td>
<td>0.96</td>
<td>OR 0.27</td>
<td>0.90</td>
<td>NS</td>
</tr>
<tr>
<td>24 mo</td>
<td>0.94</td>
<td>OR 0.34</td>
<td>0.92</td>
<td>NS</td>
</tr>
<tr>
<td>36 mo</td>
<td>0.92</td>
<td>OR 0.36</td>
<td>0.94</td>
<td>NS</td>
</tr>
</tbody>
</table>


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Duration of the Anti-Androgen in Men Undergoing 6 Months of an LHRR Agonist and Radiation Therapy for Unfavorable-Risk Prostate Cancer and the Risk of Death

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Purpose/Objective(s): Whether adding an anti-androgen (AA) to a luteinizing hormone-releasing hormone (LHRR) agonist in the radio-therapeutic management of unfavorable-risk prostate cancer (PC) reduces all cause and PC-specific mortality (ACM and PCSM) risk is unknown. We evaluated whether the extent of AA received impacted the risk of ACM and PCSM within comorbidity subgroups.

Materials/Methods: Between 1995 and 2001, 206 men with localized unfavorable-risk PC were enrolled on a randomized trial comparing radiation with (N = 102) or without (N = 104) 6 months of androgen