Early clinical experience from MRI-only based radiotherapy of localized prostate cancer

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Purpose
- To compare early clinical results of CT/MRI–planned and MRI-only planned localized prostate cancer radiotherapy results

Patients
- Localized prostate cancer, radiation therapy
  - dose to seminal vesicles 66 Gy / 2 Gy/fr
  - dose to prostate 76 Gy / 2 Gy/fr
- Image guided treatment with implanted gold seeds + daily IGRT with kV/MV/CBCT
- MRI used for contouring in both groups
- Groups
  - n = 125 patients with MRI only planned radiation therapy (RT monotherapy n=25, RT + hormone n = 100) – no CT
  - n = 125 patients with CT planned radiation therapy (RT monotherapy n = 25, RT + hormone n = 100) (MRI contouring + CT dose calculation & IGRT)

Results
- Equal early response in PSA was observed in MRI+CT and MRI only groups (see table)
- No difference in early toxicity

<table>
<thead>
<tr>
<th>Patient group</th>
<th>n</th>
<th>PSA baseline (ng/ml)</th>
<th>PSA at the end of RT (ng/ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRI planning RT 76 Gy only</td>
<td>25</td>
<td>8.1</td>
<td>5.1</td>
</tr>
<tr>
<td>CT planning RT 76 Gy only</td>
<td>25</td>
<td>8.5</td>
<td>5.9</td>
</tr>
<tr>
<td>MRI planning, hormone+RT 76 Gy</td>
<td>100</td>
<td>1.2</td>
<td>0.2</td>
</tr>
<tr>
<td>CT planning hormone+RT 76 Gy</td>
<td>100</td>
<td>1.3</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Conclusions
MRI only based RT gave expected and equivalent results after RT compared with CT (MRI registered) based treatment planning procedure.

Longer follow-up time is needed to confirm the clinical equivalence related both to tumour response and normal tissue toxicity.