Stereotactic body radiation therapy in oligometastatic patient with lymph node recurrent prostate cancer: a single centre experience.

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**Stereotactic body radiation therapy for oligometastasis**

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The aim of the present study is to evaluate the efficacy of stereotactic body radiation therapy (SBRT) as a treatment modality in 16 oligometastatic prostate cancer patients in terms of Local Control (LC), Progression-free survival (PFS), Overall Survival (OS) and toxicity.

Materials and Methods: patient characteristics (1)

- 16 patients/18 lymph nodes recurrent prostate cancer (2008-2013)
- initial disease cathegory in accordance with NCCN 2014: low (1/16), intermediate (1/16) and high risk (14/16)
- median time of lymph node recurrence from the primary treatment was 25.9 months (range 11.2–100.3 months)
- For the primary treatment, radical external beam radiotherapy, radical prostatectomy plus postoperative irradiation, and brachytherapy (BRT) were performed respectively in 5, 10 and 1 patients.
Materials and Methods: patient characteristics (2)

- Two patients were treated in different sessions for metachronous metastases.
- Mean and median prostate-specific antigen (PSA) value of 6.46 and 6.65 ng/ml, respectively (range 2.12-17 ng/ml).
- At the time of SBRT ten patients were under androgen deprivation therapy (ADT) prescribed by the Urologist before the Radiation Oncologist evaluation.
- All patients underwent a $[^{11}\text{C}]$choline-positron emission tomography/computed tomography ($[^{11}\text{C}]$choline PET/CT) at time of node metastasis.

Materials and Methods: treatment plans characteristics (3)

- A CT scan (GE LightSpeed® Scanner; GE Healthcare Diagnostic Imaging, Slough, UK) in supine position with wing and leg rest board was acquired in axial mode, with a 2.50 mm slice thickness.
- All patients had the $[^{11}\text{C}]$choline PET/CT study that was used for image registration in the planning: CT and $[^{11}\text{C}]$choline PET/CT images were automatically registered on Syntegra software (Pinnacle, Philips Medical System, Andover, MA).
- Gross Tumor Volume (GTV) was delineated using CT and PET information.
The total dose ranged between 12 to 35 Gy in 1 to 5 daily fractions, corresponding to a range between 46.3-86.9 Gy (equivalent dose fraction 2 Gy, $\alpha/\beta=1.5$) or to a range between 36-70.4 Gy (equivalent dose fraction 2 Gy, $\alpha/\beta=3$).

### Materials and Methods: treatment plans characteristics (4)

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<th>Nº fractions</th>
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<tr>
<td>1</td>
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<td>5.6</td>
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<td>4</td>
<td>2</td>
<td>11.1</td>
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<td>5</td>
<td>15</td>
<td>83.2</td>
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**Total dose (Gy)**

| 12 (1 x 12 Gy) | 1 | 5.6 |
| 30 (4 x 7.5 Gy) | 1 | 5.6 |
| 32 (4 x 8 Gy)   | 1 | 5.6 |
| 35 (5 x 7 Gy)   | 15| 83.2|
Results (1)

- all patients completed the prescribed radiation treatment, with no interruption.
- one patient reported G2 acute gastrointestinal (GI) toxicity (diarrhea).
- late toxicity was observed in only one patient who had G3 GI toxicity.
- mean and median follow-up periods were 29.35 and 29.38 months respectively (range between 6.3-68.8 months).
Results (2)

Overall survival and local control were 94%, respectively.

At last follow-up, of the 16 patients 7 had no evidence disease, 8 had active prostate cancer and 1 patient died of disease.

The pattern of recurrence was as follows:

• 4 patients had only lymph node recurrence, outside the irradiated area;
• 2 patients had lymphatic spread, one of these with an in-field progression after SBRT, and developed bone metastases;
• 2 patients manifested only bone involvement;
• the patient who died from the disease presented a systemic spread to bone and liver.
Results (3)

Biochemical relapse free survival (b-RFS)

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Conclusion

- Our experience shows that SBRT has been proven to be safe, effective and minimally invasive in the eradication of limited nodal recurrence from oligometastatic prostate cancer.

- SBRT is well tolerated therapy with a low toxicity profile and yielded a good local disease control, with an important delay in the planning of androgen deprivation therapy.