Hypofractionated Robotic Radiosurgery for Relapsed and Oligometastatic Prostate Cancer

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- 68-year-old male
- Frequency, urgency, dysuria
- Initial PSA: 3.7 ng/ml (2007)
- Radical robotic prostatectomy+lymph node dissection+seminal vesicule extraction
- Pathology: sv-, surgical boarder-, LN reactive, Gleason score 4+4=8

- Follow up threemonthly and PSA failure with 1.21 ng/ml in 2011.
- Leuprolide acetate 11.25 usage for 3 years
- Three consecutive increase in PSA (0.56, 0.59, 1.67) in 2014
- t PSA 4.22 ng/ml in September 2014
- Ga-68 PSMA PET-CT: SUV max 6.4 (just in prostate location), all other fields physiological

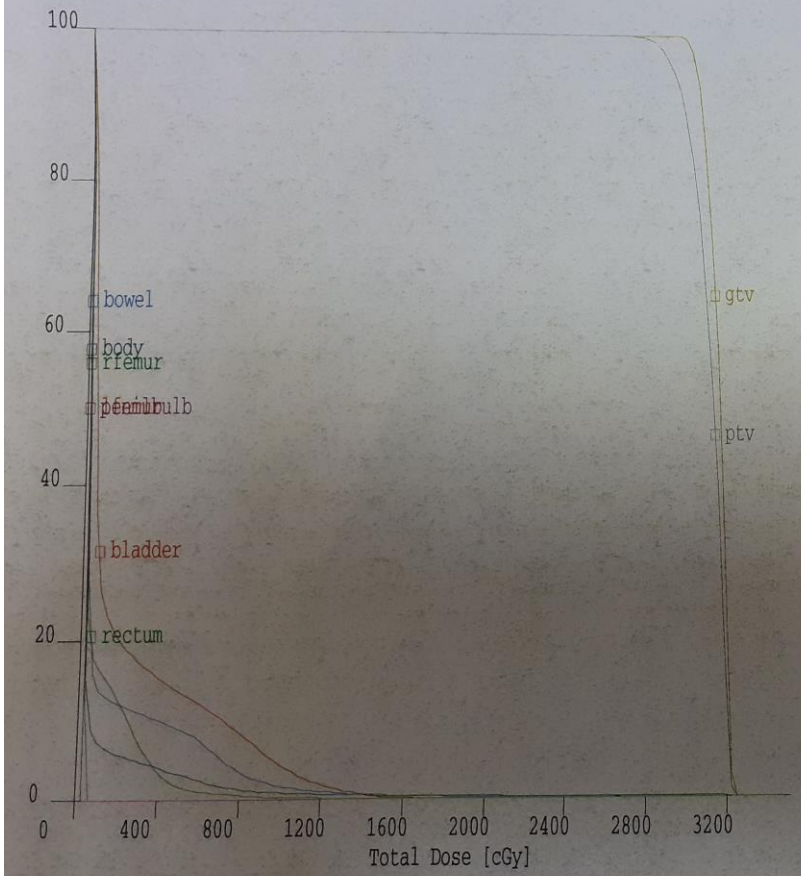
- 64 Gy was delivered in 2 Gy per fractions with 7-field IMRT in November 2014
- Remission for 3 years
- PSA failure in January 2017
- Started to take Bicalutamide+leuproreline acetate 22.5 mg sc
- Remission untill February 2019. PSA 3.7 ng/ml
- Ga-68 PSMA PET-CT: Single right external iliac lymph 2 cm node positivity, all other fields were normal

- 6 Gy per fraction SBRT delivered in 5 consecutive days in March 2019
- 94% isodose was given with Electa Synergy
- Total PSA 0.89 ng/ml
- Follow-up is maintaining

Dose Volume Histogram
Integral

CIVAN sbrt lenf nodu
Plan # 5

Thu, 21 Feb 2019
13:42:49



VOI	Vol. (cc)	Area	Total Dose [cGy] Max	Min	Avg.	
lfemur	174.3	1	0	0	0	*
rfemur	158.7	1	31	0	19	*
bowel	1705.2	3	2648	0	99	*#
gtv	5.4	99	3223	2936	3157	
penilbulb	6.1	1	0	0	0	*
body	24141.9	2	3191	0	46	*#
ptv	12.7	98	3223	2617	3113	
bladder	206.9	6	1627	0	179	*
rectum	89.4	2	1180	0	66	*

(*) VOI partially outside dose grid
(#) VOI could be outside image volume

- Radiation therapy is a well-established curative therapy for intact localized and postoperative locally recurrent prostate cancer, and an effective palliative therapy for symptomatic metastatic disease
- Its role in oligometastatic disease in an effort to improve survival is unknown
- NCCN guidelines recommend considering RT for metastases if symptomatic or residing in a weight-bearing bone; otherwise, the mainstay for M1 disease remains systemic with either medical or surgical castration, or chemohormonal therapy (CHT)

- ADT is associated with a number of side effects and potential complications, so being able to delay ADT start and/or allow for longer treatment breaks if given intermittently without compromising survival is a worthy pursuit
- A shorter course of ADT with concurrent RT to maximize control may be another strategy to limit potential toxicity associated with ADT
- Early detection of oligometastases with sensitive, accurate imaging may allow for more proactive therapy and eradication of locally measurable disease, delayed time to ADT, and, perhaps, cure if there is no associated micrometastatic disease and radiation is able to eradicate the isolated metastatic lesion(s)

- Various hypofractionated radiation therapy dosing schedules have been proposed for treatment in the oligometastatic setting
- 1 fraction of 20 Gy
- 3 fractions of 10 Gy
- 5-6 fractions of 5 or 6 Gy
- 10 fractions of 5 Gy
- All deemed to be of equivalent efficacy

- **POPSTAR**
- A single-arm, prospective clinical trial that assessed the safety and feasibility of SBRT (20 Gy, single fraction per site) to all metastatic sites in patients with oligometastatic prostate cancer (3 or fewer sites of nodal or bony metastases as detected by NaF PET scan)
- Thirty-three patients received SBRT to 50 oligometastatic sites, 32 of which successfully completed treatment (feasibility rate, 97%; 95% CI, 84%–100%)
- Only one grade 3 adverse event (fracture) and no grade 4 or 5 events were observed
- In 22 patients who had hormone-sensitive disease, freedom from ADT treatment at 24 months was 48% (95% CI, 31%–75%)
- These data suggest that SBRT to distant nodal and bony metastatic sites is feasible, well tolerated, and potentially effective in delaying time to systemic therapy