



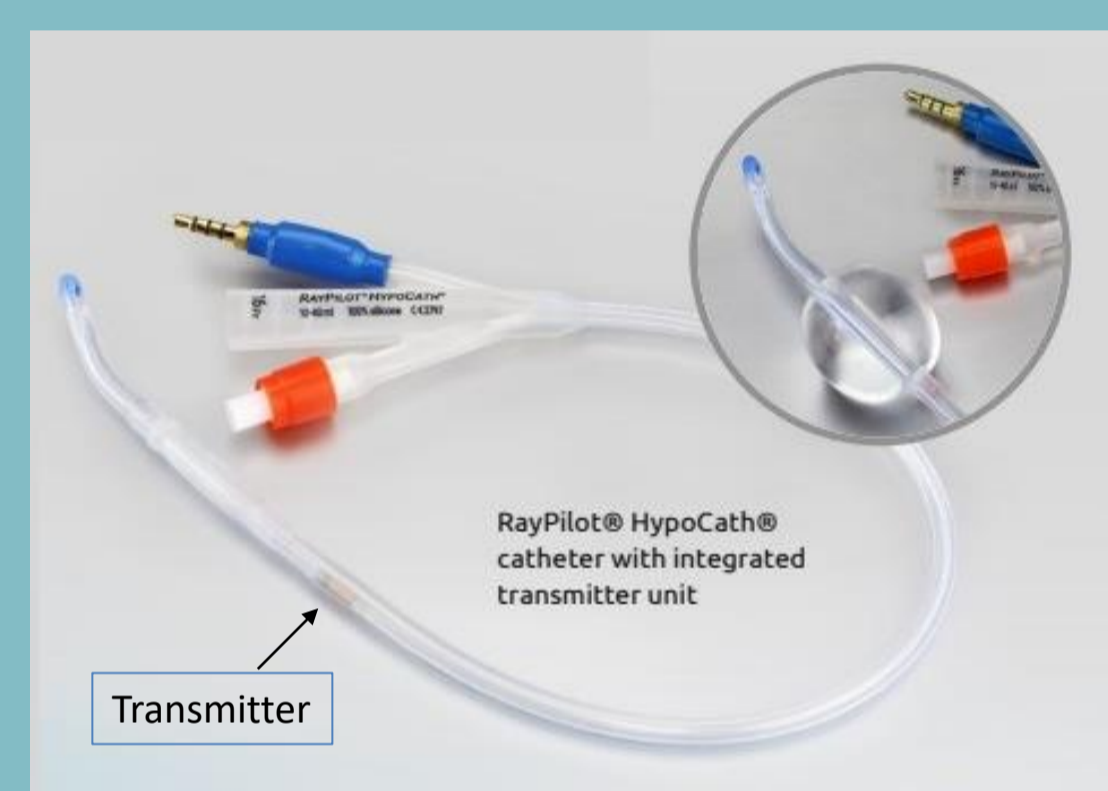
## SBRT for localized prostate cancer using the RayPilot system with modified Foley Catheter based on HypoCath system permitting a real-time intrafraction tracking prostate motion. Our early single institution experience. #40146

Georgios Kritselis, M.D.<sup>a</sup>, Achilles Ploumidis, MD, BSc, MSc, PhD, FEBU, Head of Urology Department, Athens Medical Group, Athens, Greece D.<sup>b</sup>, Athanasios Pappas, MD, FEBU, Consultant Urologist, Athens Medical Group, Athens, Greece, Marinos Tsiatas, MD, PhD, BSc (Biol) Director Medical Oncologist Department of Medical Oncology and Clinical Trials Unit Athens Medical Center. Katerina Silivridou, MSc<sup>a</sup>, Michalis Spyarakos MSc<sup>a</sup>, Ioannis Floros, MSc<sup>a</sup>. From the Departments of Radiation Oncology<sup>a</sup>, Surgery<sup>b</sup>, and Medical Oncology<sup>c</sup>, Athens Medical Center, Athens, Greece.

### Background:

The UK PACE trials have validated the efficacy of Stereotactic Body Radiation Therapy (SBRT) with five fractions for prostate cancer patients who would typically receive moderate or conventionally fractionated external beam radiotherapy. In the PACE-B study, the acute genitourinary (GU) and gastrointestinal (GI) toxicity of SBRT (36.25 Gy in 5 fractions) were compared to moderately fractionated external beam radiotherapy (62 Gy in 20 fractions), showing no significant difference 12 weeks post-treatment completion.

- Study population- NCCN criteria
- Low risk prostate cancer
  - T1-2a & PSA <10ng/ml & Gleason 3+3 = 6
  - Favourable Intermediate risk prostate cancer
  - T1/2 and 1 or more of PSA 10-20ng/ml or Gleason score of 3+4=7
  - No TURP & suitable for SBRT
  - 80cc max volume
  - No hip replacements
  - No ADT



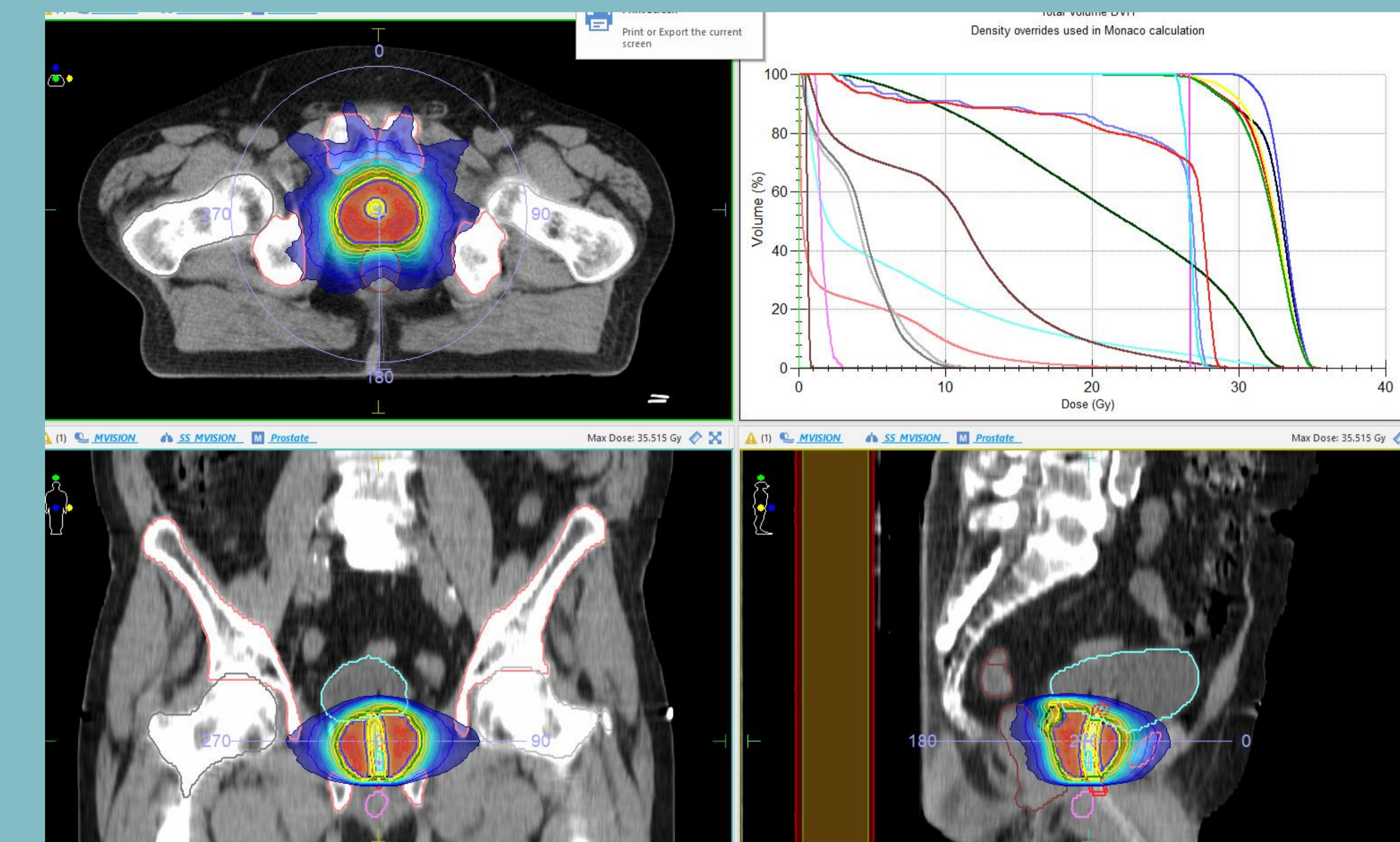
### Patients & Methods :

The integration of the RayPilot system with the HypoCath tumor tracking device has shown promise for reducing acute toxicity by enabling a urethra-sparing approach on a Linac-based system. The HypoCath system, featuring a transmitter-equipped Foley catheter, precisely locates the prostatic urethra. This precision may mitigate genitourinary toxicity through targeted dose reduction. Moreover,, it facilitates tumor tracking, leading to narrower safety margins around the prostate and reduced radiation to the surrounding tissues, including the rectum.

### Results & discussion :

• Five patients (PSA<10ngr/ml, Adenocarcinoma Gleason Score ≤7ngr/ml, T2N0M0, IPSS score<12) underwent a five-fraction SBRT regimen (7.25Gy/fr / 36.25Gy) (prostate+proximal SV) from Aug. 2022 – Dec. 2023, using the RayPilot system. For the CT sim the RayPilot ViewCath was inserted into patients bladder. Rectal suppository administered before scanning. The bladder drained of urine and then filled with 100 ml of water before CT sim. CT slices of 1.25 mm were acquired. The ViewCath was removed post-CT simulation. For structure delineation and treatment planning **Monaco TPS (Elekta)** was used. The CTV defined as the prostate minus the urethral planning risk volume (PRV). The CTV to PTV margin was set at CTV plus 3 mm, except posteriorly where the prostate abuts the rectum, for which a 2 mm margin was used. The 6MV FFF VMAT treatments were delivered using an **Elekta Versa HD** (Elekta Solutions AB, Stockholm, Sweden) linac. The HypoCath, part of the RayPilot system, was inserted into the bladder for real-time tracking with a deviation tolerance set to 2 mm. Daily pre-treatment CBCTs were taken to verify setup and assess bladder and rectal filling. Re-imagining was conducted if transmitter displacement exceeded 2 mm. The average treatment duration was 10 minutes.

• Early follow-up with a median of **six** months, no SBRT-related GU or GI side effects were observed. The HypoCath system was well tolerated.



### Conclusion & perspectives :

Our initial experience demonstrates the safety and effectiveness of prostate SBRT using the RayPilot system with HypoCath tumor tracking, reducing GU side effects and ensuring treatment tolerability. Early follow-up shows no SBRT-related complications, suggesting its potential for improving patient outcomes. Further research should focus on long-term follow-up, technology advancements, and multidisciplinary collaboration to optimize SBRT protocols and enhance patient care in prostate cancer treatment.

### Acknowledgement :

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