

READ THE ARTICLE



# PROSTATE STEREOTACTIC BODY RADIOTHERAPY WITH SYNCHRONY®-BASED FIDUCIAL TRACKING ON THE RADIXACT® TREATMENT DELIVERY SYSTEM

**Authors:** Adithya Vikrama Acharya • Sanjay Hunugundmath • Mariya Deputy • Amit Nirhali • Vishram Naik • Sharad Gadhave (Sahyadri Superspeciality Hospital, Pune, India).

**Purpose:**

This case series reports the clinical experience of delivering **stereotactic body radiation therapy (SBRT)** for localized prostate cancer using the **Radixact® X9 System** with **Synchrony®** fiducial-based real-time motion tracking.

**Methods:**

<b>Design</b>	Retrospective study of 7 men with organ-confined prostate cancer
<b>Risk groups</b>	29% favourable intermediate risk, 57% unfavourable intermediate risk, 14% high risk
<b>Motion Management</b>	Synchrony® for intrafraction motion management using 3 gold fiducials, placed under ultrasound guidance – 2 weeks prior to simulation
<b>Planning</b>	Accuray Precision® Treatment Planning System with VOLO™ Ultra optimizer, using TomoHelical™ technique with 2.5 cm dynamic jaw. The CTV included the proximal 1 cm of seminal vesicles. An isotropic margin of 3 mm was used to form the PTV. Dose constraints followed NRG-GU005 protocol with minor modifications
<b>Treatment</b>	Radixact SBRT, 36.25 Gy in five consecutive fractions. Daily ClearRT® kVCT imaging for patient alignment (see Figure 1)
<b>Follow-up</b>	Minimum of 5-6 months

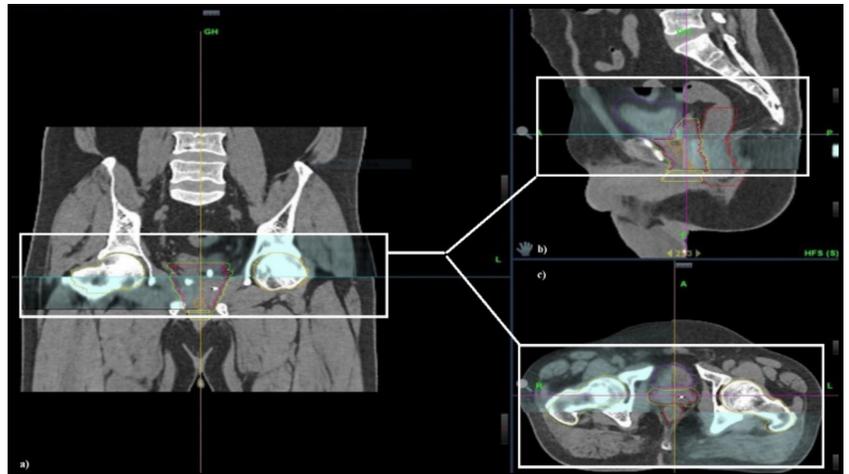


Figure 1: Overlap of daily kilovoltage fan-beam CT (white box) imaging with initial simulation scans for verification of position in (a) coronal, (b) sagittal, and (c) axial sections

**Results:**

<b>Average Beam on Time</b>	8 minutes
<b>Toxicity</b>	All patients experienced ≤Grade 2 genitourinary toxicity, which was slightly higher in patients with prior urological procedures. No ≥Grade 3 toxicities. All patients tolerated treatment well and all acute toxicities subsided during the 5-6 month follow-up period.
<b>Clinical Outcomes</b>	PSA levels declined post-treatment to <0.3 ng/mL

**Conclusions:**

**“Prostate SBRT using Synchrony® based fiducial tracking shows great promise for intrafraction motion management. By providing real-time tracking, the need for extensive treatment margins is reduced significantly, thereby minimizing radiation exposure to surrounding OARs mainly to the rectum and bladder. Simultaneously, the precision while correcting the offset created due to the bladder and the rectal filling enables improved target conformity and better sparing of normal tissues, potentially leading to better clinical outcomes and reduced toxicity. Our experience emphasizes the importance of integrating AI-driven tracking systems such as Synchrony® into prostate SBRT for a safer and more effective treatment delivery.”**

Limitations include small patient cohort and limited follow-up duration

Acharya A, Hunugundmath S, Deputy M, et al. (May 08, 2025) Prostate Stereotactic Body Radiotherapy With Synchrony®-Based Fiducial Tracking on Radixact® X9. Cureus 17(5): e83742. doi:10.7759/cureus.837

**Important Safety Information:**

Most side effects of radiotherapy, including radiotherapy delivered with Accuray systems, are mild and temporary, often involving fatigue, nausea, and skin irritation. Side effects can be severe, however, leading to pain, alterations in normal body functions (for example, urinary or salivary function), deterioration of quality of life, permanent injury, and even death. Side effects can occur during or shortly after radiation treatment or in the months and years following radiation. The nature and severity of side effects depend on many factors, including the size and location of the treated tumor, the treatment technique (for example, the radiation dose), and the patient's general medical condition, to name a few. For more details about the side effects of your radiation therapy, and to see if treatment with an Accuray product is right for you, ask your doctor. Accuray Incorporated as a medical device manufacturer cannot and does not recommend specific treatment approaches. Individual results may vary.

