# REAL-TIME ADAPTIVE MOTION MANAGEMENT IN PROSTATE STEREOTACTIC BODY RADIATION THERAPY (SBRT): CLINICAL AND DOSIMETRIC ANALYSIS OF 25 PATIENTS

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**Methods:**

- **Design:** Retrospective study of 25 patients with localized prostate cancer
- **Treatment:** SBRT - 40 Gy in 5 fractions
- **Planning:** Accuray Precision® Treatment Planning System using VOLO™ Classic or VOLO Ultra optimizer, 2.5 cm dynamic jaws
- **Motion Management:** Synchrony® real-time motion management system on the Radixact® System
- **Follow-up:** Median 28 months; toxicity graded by CTCAE v4.03

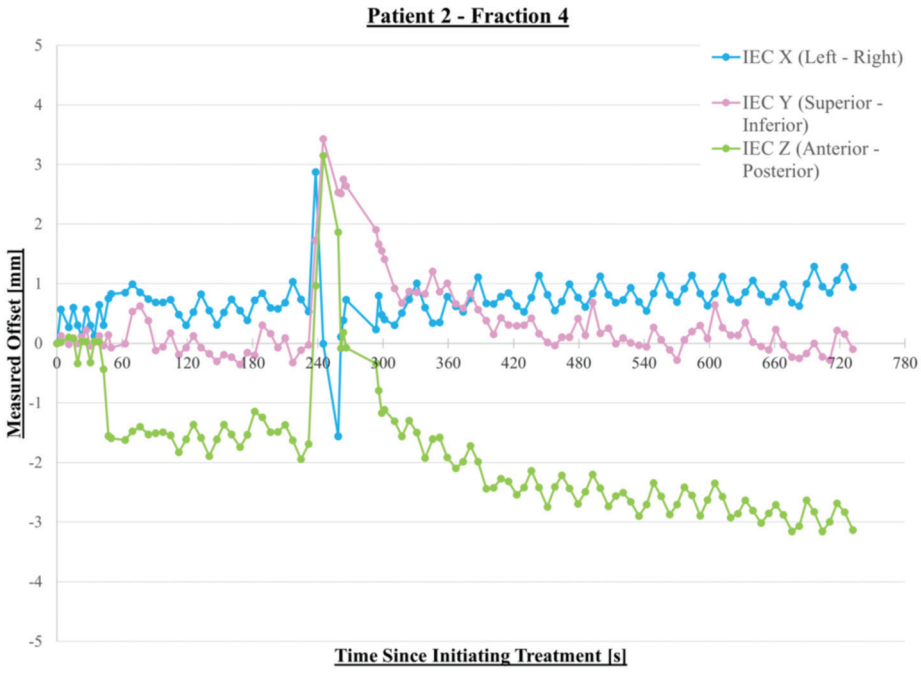


*Figure 1: Measured Target Offsets for Patient 2, Fraction 4*

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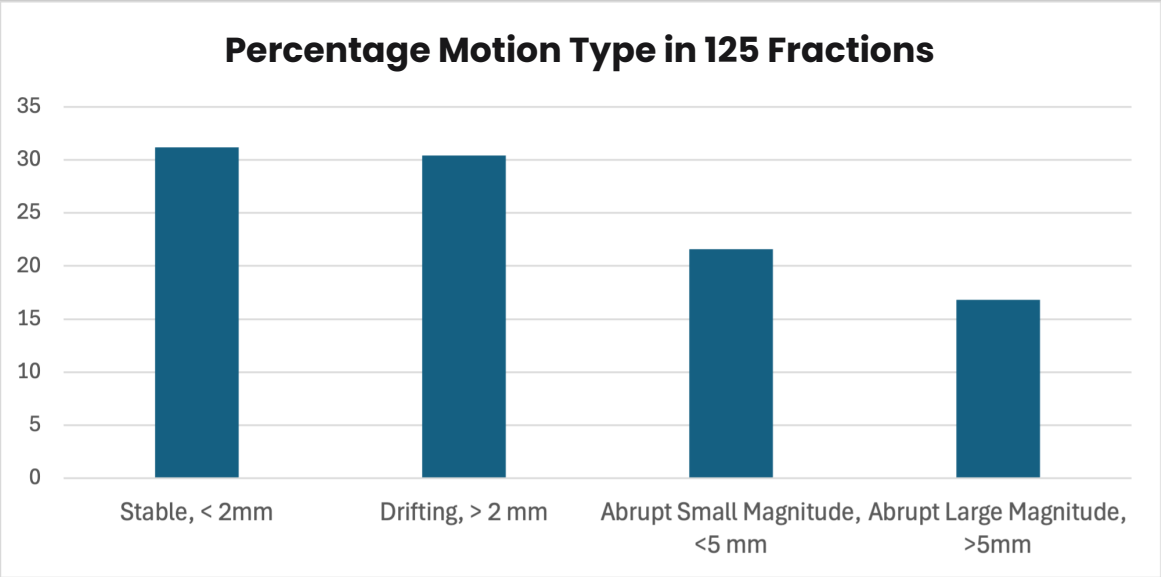


*(adapted from table 4 from the original article)*

## Results

- **Dosimetry:** All plans met target coverage and organ at-risk (OAR) constraints; average PTV conformality index 1.13, homogeneity index 1.09.
- **Motion:** All but one patient had ≥1 fraction with >2 mm motion; abrupt large motions (>5 mm) occurred 77 times over 36 treatments, sometimes requiring mid-treatment CT/repositioning.
- **PSA Response:** Median post-treatment PSA 0.30 ng/mL; all patients <2.0 ng/mL at 15 months; transient PSA "bounces" seen in 3 patients.
- **Toxicity:** 14 patients had new grade 1 genitourinary (GU) symptoms; 3 had grade 2 GU toxicity; 5 had grade 1 gastrointestinal symptoms; 3 reported grade 1 gastrointestinal symptoms; 3 reported grade 1 fatigue.

## Conclusion

**"Our findings suggest that prostate SBRT with Radixact Synchrony provides excellent target coverage while effectively managing intrafraction motion. The observed PSA response and OAR dose metrics support its use as a treatment modality for localized prostate cancer."**

Limitations include the retrospective design, the small sample size, and lack of patient-reported data.

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