EXCELLENT OUTCOMES WITH STEREOTACTIC BODY RADIOTHERAPY IN AN ELDERLY PATIENT WITH LOCALLY PROGRESSIVE IMMUNOTHERAPY-RESISTANT RENAL CELL CARCINOMA

Authors:
Torrisi, Laura Giannini, Roberta Tummineri, Chiara Lucrezia Deantoni, Andrei Fodor, (IRCCS Ospedale San Raffaele – Milano, Italy)

Challenge:
Systemic therapies, particularly targeted agents and immune checkpoint inhibitors (ICIs), have long been the primary treatment approach for metastatic renal cell carcinoma (mRCC). However, when immune-related toxicities arise, alternative approaches to treatment are required.

Solution:
Technological advancements in radiotherapy, especially stereotactic body radiotherapy (SBRT) has allowed for the precise delivery of high-dose, hypofractionated radiation with steep dose gradients and sub-millimeter accuracy.

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Study Design:

Patient	• 80-year-old male • History of hypertension and mild chronic kidney disease
Diagnosis	Diagnosed with clear cell RCC and pulmonary metastases
2019 Treatment History	• Initially treated with **nivolumab + ipilimumab** (CheckMate 214 protocol). • Immunotherapy discontinued due to **immune-mediated pancreatitis and nephritis**
2021 Treatment History	• A **progressive renal lesion** was identified • Given patients comorbidities and oligoprogressive status, **SBRT was proposed as definitive local treatment**

Treatment Details:

Technology	**CyberKnife® System with Synchrony®** Fiducial Tracking™ with Respiratory Modelling
Fiducials	**Four markers implanted**; 3 in and 1 near the tumor
Planning Margins	3 mm PTV margin; no CTV margin
Organs at Risk	Kidneys, bowel, spinal cord, liver (figure 1)
Prescription	**40 Gy in 5 consecutive fractions** over one week (figure 2)

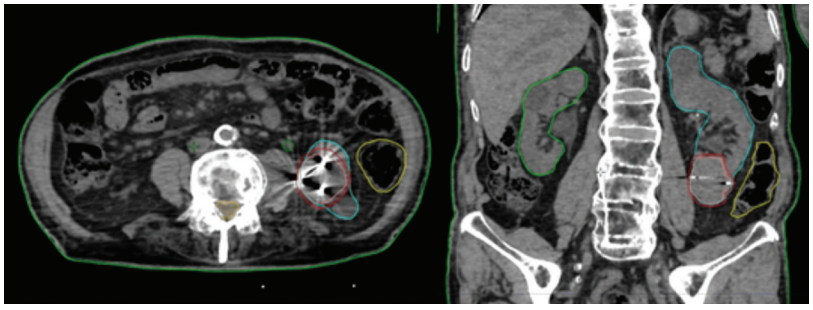

Figure 1: Left renal volume delineation from the treatment CT scan in the axial and coronal planes.

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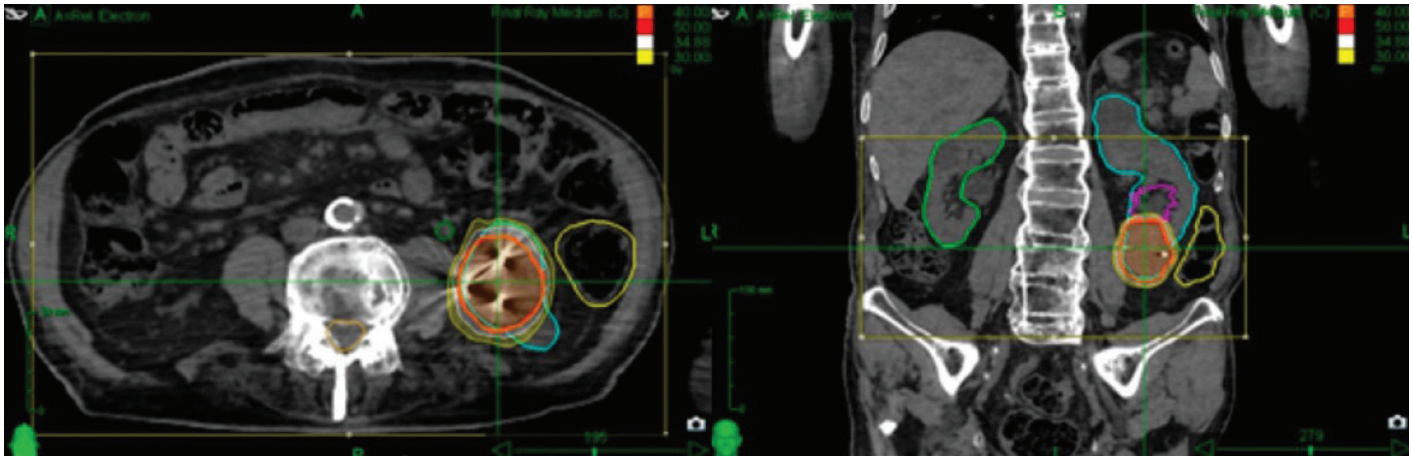

Figure 2: Axial and coronal views from the patient's SBRT plan illustrating the radiation dose distribution.

Outcomes:

Toxicity	**No acute grade ≥2 toxicity** reported
Clinical Outcome	• **Lesion size reduced** from 38 mm to 30 mm within 3 months • **Durable disease control** observed at **42-month follow-up**, despite discontinuation of immunotherapy
Renal Function	**Renal function preserved**; creatinine remained stable post-SBRT

Conclusion:

"This case highlights the potential feasibility and safety of SBRT as a local treatment option for RCC in patients with mRCC. The durable disease control observed despite discontinuation of immunotherapy suggests that SBRT may have a valuable role in selected clinical scenarios."

Torrisi M, Giannini L, Tummineri R, et al. (June 05, 2025) Excellent Outcomes With Stereotactic Body Radiotherapy in an Elderly Patient With Locally Progressive Immunotherapy-Resistant Renal Cell Carcinoma. Cureus 17(6): e85399. doi:10.7759/cureus.85399

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