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Stereotactic Body Radiotherapy and Immunotherapy for Metastatic Renal Cell Carcinoma - Croatian Uro-Oncology Network Experience

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Background & objective

Immune checkpoint inhibitors (ICI), alongside TKIs, are the cornerstone of mRCC treatment. SBRT is increasingly used as metastasis-directed treatment in mRCC patients receiving ICI. Retrospective studies can produce selection and immortal-time bias.

OBJECTIVE
What is the prognosis of the whole ICI-treated cohort—and does the timing of SBRT add independent survival information in patients with mRCC?

Methods

N=204
mRCC patients treated with ICI within Croatian Uro-Oncology Network

44.7
months of median follow-up

No-SBRT N=151 (74.0%)
Pre-ICI SBRT N=23 (11.3%)
On-ICI SBRT N=21 (10.3%)
Post-ICI SBRT N=9 (4.4%)

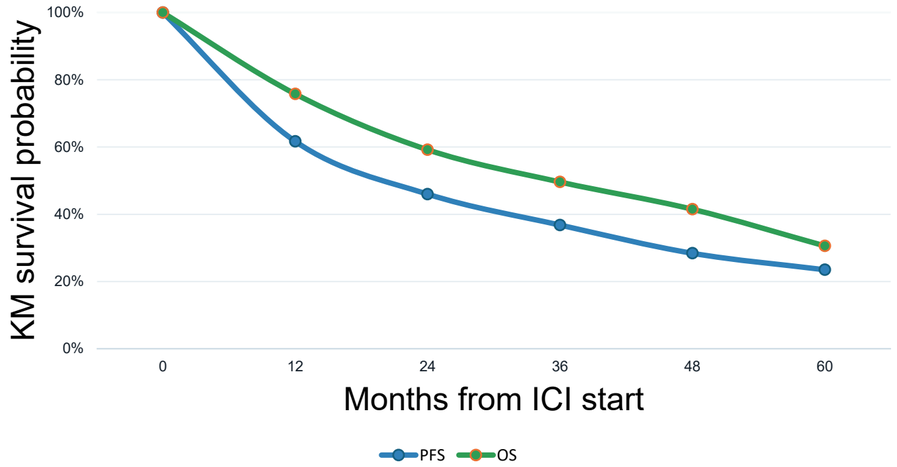
Pre: before ICI start
On: ICI start to last dose
Post: after last ICI dose

PFS/OS were calculated from ICI start; among SBRT-treated patients, survival was also indexed from first SBRT. Penalized time-dependent Cox models adjusted for clinical risk, metastatic pattern, prior nephrectomy, ICI regimen, neutrophil to lymphocyte ratio (NLR) and haemoglobin level prior to ICI start were evaluated.

Baseline groups imbalances (No-SBRT vs SBRT)
Age p=.005 • ECOG p=.006 • IMDC p=.021 • brain metastases p<.001 • oligometastatic status p=.002 • nephrectomy p=.023

Whole cohort Kaplan-Meier estimates; medians include 95% CI.

136 PFS events • 114 deaths



mPFS
20.9 mo
95% CI 15.0-29.8

mOS
34.4 mo
95% CI 25.5-40.8

Median survival, months

Timing group	n	PFS	OS
No SBRT	151	19.1	29.4
Pre-ICI	23	15.0	32.8
On-ICI	21	35.5	67.1
Post-ICI	9	68.8	93.7

Time-dependent analysis

On-ICI SBRT was not independently associated with PFS or OS after adjustment.

PFS
HR 1.29
95% CI 0.63-2.67
p=.485

OS
HR 0.68
95% CI 0.29-1.61
p=.382

Adjusted model n=190

Sensitivity analysis was consistent

Unadjusted time-dependent, no SBRT vs on-ICI only:
PFS HR 1.30 (95% CI 0.67-2.50)
OS HR 0.68 (95% CI 0.31-1.51)

From first SBRT

Timing	Median PFS	Median OS
Pre-ICI	29.3	40.3
On-ICI	17.7	54.0
Post-ICI	21.4	42.9

Limitations

Retrospective design • small SBRT subgroups • wide confidence intervals • residual confounding and indication bias despite time-dependent modelling

CONCLUSION

SBRT-treated patients had favourable descriptive outcomes, but the apparent Kaplan-Meier advantage was not sufficient evidence of an independent survival benefit. SBRT remains a feasible metastasis-directed strategy in selected mRCC patients and warrants prospective evaluation.

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