

Single-fraction Radiosurgery for the Treatment of Renal Cell Carcinoma

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Abstract

Objectives: High-dose local stereotactic radiosurgery (SRS) was added for selected patients to improve local tumor control and overall survival. We report on patients with renal tumors who were treated with single fraction robotic SRS as an alternative to nephrectomy.

Methods: N=103 patients with an ECOG status of 0 or 1 and a life expectancy of more than 1 year having a small renal mass and the indication for therapy were entered into a prospective study of single fraction SRS at 25Gy. Patients whose lesions could have been removed locally by surgery were excluded. Patients had to have renal lesions of less than 4cm with a histological confirmed diagnosis of renal cell carcinoma (RCC). Prior to SRS three gold fiducials were planted into the renal parenchyma under ultrasonography guidance in local anaesthesia as an outpatient procedure. Before treatment all patients received prophylactically 4 mg of Dexamethasone and 8 mg of ondansetron against nausea.

Results: Median age was 72.7 years (39.9-92.8). R.E.N.A.L. score was low in 13, moderate in 57 and high in 33 patients. 45 patients had singular renal units. Median follow-up was 26.9 months (1.8 - 52.6). Local tumor control at 20.7 months median follow-up was 97% (95% CI: 89-99%). 58 lesions showed a measurable tumor size reduction including 14 complete remissions and 44 partial remissions according to RECIST criteria. Renal function remained stable with a median serum creatinine at baseline of 1.28 mg/dl (0.4 -8.2) and 1.30 mg/dl (0.4-7.0) at follow-up. In three patients grade I erythrodermia, in 7 patients grade I fatigue and in two patients grade I nausea occurred. In all patients nephrectomy was avoided.

Conclusions: Single-fraction SRS as an outpatient procedure is a safe and efficient therapeutic option to avoid treatment-related loss of renal function and hemodialysis in selected patients with RCC. Short term follow up of oncological and functional results is excellent. Further studies are needed to determine the limits of SRS in this setting and long term results.

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