

High-dose, high-precision radiation therapy safe, effective for solitary kidney cancer patients with only one kidney

October 22 2018

Treatment of renal cell carcinoma with stereotactic radiation therapy is as safe and effective for patients with one kidney as it is for those who have two, according to an analysis of the largest-ever, international dataset of solitary kidney patients to receive this emerging treatment. The findings will be presented today at the 60th Annual Meeting of the American Society for Radiation Oncology (ASTRO).

Renal cell carcinoma (RCC), which has been rising in [incidence](#) for decades, is the most common form of [kidney](#) cancer in adults in the United States, with approximately 65,000 new cases diagnosed annually. It is responsible for nearly 15,000 deaths each year. It is typically treated surgically, with tumor ablation reserved for [patients](#) who are not able or willing to have surgery.

A specialized form of [radiation](#) treatment known as stereotactic ablative radiotherapy (SABR), also known as stereotactic body radiation therapy (SBRT), is emerging as a potential alternative for kidney cancer patients. SABR has been shown to be effective in treating cancers in the lung, liver and spine using substantially higher doses of radiation delivered in a single, or just a few, treatment sessions. Earlier this year, a study [published](#) in the journal *Cancer* showed that SABR was safe and effective in treating patients with RCC who had both kidneys remaining. This new study shows it is just as safe and effective for patients who have only one kidney.

"Although RCC historically has been considered resistant to conventional radiation therapy, the high doses and high precision achievable with SABR overcome this resistance," said lead author Rohann J. M. Correa, MD, Ph.D., a radiation oncology resident at London Health Sciences Center in London, Canada. "Kidney SABR is thus emerging as a versatile, non-invasive outpatient treatment requiring one visit or a few visits. Our analysis demonstrates SABR to be highly effective with minimal side effects for RCC patients with a single kidney."

Dr. Correa and his colleagues analyzed patient data from nine institutions across the United States, Germany, Australia, Canada and Japan within the International Radiosurgery Oncology Consortium for Kidney (IROCK) group. Of the 223 patients who underwent renal SABR, 81 had a solitary kidney. In the single-kidney cohort, patients were an average of 67.5 years old at time of treatment, mostly male (69 percent) and of good performance status (ECOG 0-1 in 97.5 percent). The median biologically-effective dose of [radiation therapy](#) was 87.5 Gray (Gy) and was identical in the solitary and bilateral cohorts (p=0.103).

With a median follow-up of 2.6 years, SABR provided 98 percent two-year local control and 98 percent two-year cancer-specific survival for RCC patients with a solitary kidney. These rates were not significantly different from those for patients with two kidneys treated with SABR: 97.8 percent local control (hazard ratio (HR) 0.89, p=0.923) and 94.3 percent cancer-specific survival (HR 0.16, p=0.082). Overall survival also did not differ between the cohorts, at 81 percent for the solitary group and 82 percent for the bilateral group (HR 0.75, p=0.445).

Renal function was modestly impacted by SABR. The decline in estimated glomerular filtration rate (eGFR) was similar for both cohorts, with average decreases of -5.8 (\pm 10.8 mL/min) in the solitary cohort and

-5.3 (± 14.3 mL/min) in the bilateral cohort ($p=0.984$). None of the solitary kidney patients required dialysis, while six (4.2 percent) in the bilateral cohort did.

"We were somewhat surprised that SABR could achieve such a high local control rate without more significantly impacting renal function in the solitary kidney setting," said Dr. Correa. "While this is partly attributable to the technology of SABR—allowing very high radiation doses to be delivered with incredible precision, thus maximally sparing renal function—it is also important to acknowledge important differences in baseline characteristics between groups."

Patients with a single kidney had smaller tumors on average than patients with two kidneys (mean 3.7 cm vs. 4.3 cm, $p=0.029$) correlated with more profound decreases in eGFR after SABR (hazard ratio (HR) 4.2, $p=0.029$). "From this, we concluded that proper patient selection will be important in optimizing outcomes for solitary kidney patients treated with SABR," said Dr. Correa.

"Treatment of RCC in the solitary kidney setting poses a unique management challenge, since a careful balance of minimizing nephron loss and maximizing cancer control is essential," concluded Dr. Correa. "Recognizing the challenges of randomized controlled trials in this unique and somewhat-rare population, we hope that our large, international dataset will significantly advance the paradigm of kidney SABR, increasing awareness and access for patients facing this challenging management scenario."

More information: The abstract, "Renal SABR in patients with a solitary kidney: An individual-patient pooled analysis from the International Radiosurgery Oncology Consortium for Kidney (IROCK)," will be presented in detail during a news briefing and an oral abstract session at ASTRO's 60th Annual Meeting in San Antonio.

Provided by American Society for Radiation Oncology

Citation: High-dose, high-precision radiation therapy safe, effective for solitary kidney cancer patients with only one kidney (2018, October 22) retrieved 24 April 2024 from <https://medicalxpress.com/news/2018-10-high-dose-high-precision-therapy-safe-effective.html>

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