Kidney

5-year outcomes after stereotactic ablative body radiotherapy for primary renal cell carcinoma: an individual patient data meta-analysis from IROCK (the International Radiosurgery Consortium of the Kidney)

Shankar Siva, Muhammad Ali, Rohann J M Correa, Alexander Muacevic, Lee Ponsky, Rodney J Ellis, Simon S Lo, Hiroshi Onishi, Anand Swaminath, Mark McLaughlin, Scott C Morgan, Fabio L Cury, Bin S Teh, Anand Mahadevan, Irving D Kaplan, William Chu , William Grubb, Raquibul Hannan, Michael Staehler, Andrew Warner, Alexander V Louie

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Meta-Analysis

BACKGROUND

Stereotactic ablative body radiotherapy (SABR) is a non-invasive treatment option for primary renal cell carcinoma, for which long-term data are awaited. The primary aim of this study was to report on long-term efficacy and safety of SABR for localised renal cell carcinoma.

METHODS

This study was an individual patient data meta-analysis, for which patients undergoing SABR for primary renal cell carcinoma across 12 institutions in five countries (Australia, Canada, Germany, Japan, and the USA) were eligible. Eligible patients had at least 2 years of follow-up, were aged 18 years or older, had any performance status, and had no previous local therapy. Patients with metastatic renal cell carcinoma or upper-tract urothelial carcinoma were excluded. SABR was delivered as a single or multiple fractions of greater than 5 Gy. The primary endpoint was investigator-assessed local failure per the Response Evaluation Criteria in Solid Tumours version 1.1, and was evaluated using cumulative incidence functions.

FINDINGS

190 patients received SABR between March 23, 2007, and Sept 20, 2018. Single-fraction SABR was delivered in 81 (43%) patients and multifraction SABR was delivered in 109 (57%) patients. Median follow-up was 5·0 years (IQR 3·4-6·8). 139 (73%) patients were men, and 51 (27%) were women. Median age was 73·6 years (IQR 66·2-82·0). Median tumour diameter was 4·0 cm (IQR 2·8-4·9). 96 (75%) of 128 patients with available operability details were deemed inoperable by the referring urologist. 56 (29%) of 190 patients had a solitary kidney. Median baseline estimated glomerular filtration rate (eGFR) was 60·0 mL/min per 1·73 m2 (IQR 42·0-76·0) and decreased by 14·2 mL/min per 1·73 m2 (IQR 5·4-22·5) by 5 years post-SABR. Seven (4%) patients required dialysis post-SABR. The cumulative incidence of local failure at 5 years was 5·5% (95% CI 2·8-9·5) overall, with single-fraction SABR yielding fewer local failures than multifraction (Gray's p=0·020). There were no grade 3 toxic effects or treatment-related deaths. One (1%) patient developed an acute grade 4 duodenal ulcer and late grade 4 gastritis.

INTERPRETATION

SABR is effective and safe in the long term for patients with primary renal cell carcinoma. Single-fraction SABR might yield less local failure than multifraction, but further evidence from randomised trials is needed to elucidate optimal treatment schedules. These mature data lend further support for renal SABR as a treatment option for patients unwilling or unfit to undergo surgery.