IMAGING

Improving detection of bone metastases in renal cell carcinoma

Current clinical imaging tests often fail to detect small bone metastases from renal cell carcinoma (RCC). Detection of metastases is crucial to determine whether certain forms of treatment might be suitable for individual patients. ^{18}F-NaF PET–CT has been used in other cancers to more-accurately detect bone metastases. In a prospective study, researchers aimed to identify whether this technology had increased sensitivity for detecting occult bone metastases in 10 patients with RCC compared with standard-of-care imaging with bone scintigraphy or CT alone.

As imaging tests are generally expensive and time consuming to perform, an adaptive trial design approach was applied to this imaging study, which enabled the researchers to acquire important outcome data early on in the study and to adapt the trial accordingly. Ferdia Gallagher, corresponding author, summarizes: "This prospective trial showed that fluoride PET–CT is twice as sensitive as CT, and three times as sensitive as conventional bone
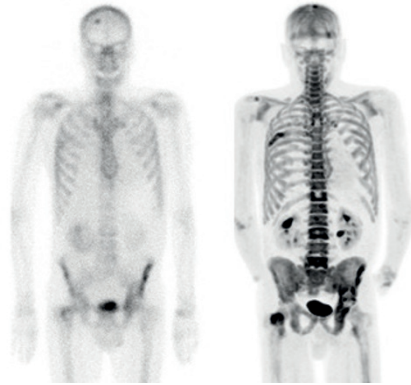
Patient with RCC and bone metastases who was imaged using routine ^{99m}Tc-MDP bone scintigraphy (left) and [18]NaF PET–CT (right). Image courtesy of Emma Gerety.

scintigraphy in identifying bone metastases." Collectively, CT and bone scintigraphy identified only 65% of the metastases detected by ^{18}F-NaF PET–CT. Interestingly, the ^{18}F-NaF PET–CT imaging technique also detected a greater number of metastases in patients with a good performance status. The adaptive design enabled only a small number of patients to be accrued

before a significantly better outcome was demonstrated for this technique compared with CT alone or bone scintigraphy.

Gallagher comments on future plans to move this technology forward: "Fluoride PET–CT could be used to significantly alter patient management in the future. We plan to study how this test could be used in a routine clinical setting to improve the outcomes of patients with metastatic RCC." The results of this promising study show how ^{18}F-NaF PET–CT can identify occult metastases in patients whose metastases are undetectable with standard-of-care imaging, and highlight how patient management might be considerably improved as a result of this technique.

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