New radiotracer shows impressive diagnostic potential

A new class of radiopharmaceuticals targeting fibroblast-activated proteins in cancers can identify 28 different kinds of malignant tumour effectively and non-invasively, according to a recent investigation.

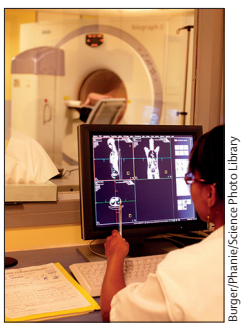
In the retrospective study, Clemens Kratochwil (University Hospital Heidelberg, Heidelberg, Germany) and colleagues evaluated ^{68}Ga-FAPI PET/CT scans from 80 patients who were referred by their clinicians because of ongoing diagnostic challenges that could not be resolved using ^{18}F-FDG PET/CT scans or other conventional imaging methods. All patients had received an injection of 122–312 MBq of ^{68}Ga-FAPI-04 before having PET/CT scans 1 h later. The evaluated patients had 28 different tumour types, including 54 primary tumours and 229 metastases.

Tumour ^{68}Ga-FAPI uptake was measured by mean and maximum standardised uptake value (SUV_{mean} and SUV_{max}), with the highest uptake (mean SUV_{max} >12) observed in sarcoma, cholangiocarcinoma, oesophageal, lung, and breast cancers, and the lowest (mean SUV_{max} <6) in gastric, renal-cell, pheochromocytoma, adenoid cystic, and differentiated thyroid cancers. Intermediate tumour uptake (mean SUV_{max} 6–12) occurred in prostate, pancreatic, ovarian, colorectal, hepatocellular, and head-and-neck cancers. Excellent image contrast and tumour delineation were achieved in both the intermediate and high-uptake groups. A further benefit is that ^{68}Ga-FAPI PET/CT might improve patient comfort and accelerate clinical workflow, since it can be done without the usual patient preparations necessary for ^{18}F-FDG PET/CT scans, such as pre-procedural fasting.

"The vast majority of tumours do not exhibit tumour-specific molecular signatures that can be targeted for PET imaging as well as therapy," explained Tobias Maurer (University Medical Centre Hamburg-Eppendorf, Hamburg, Germany). "Thus, the novel ^{68}Ga-FAPI radiotracer directed against cancer-associated fibroblast might close this diagnostic gap and enable a more accurate staging of metastatic spread in several cancer entities, possibly translating in better oncological outcomes."

"This new tumour-seeking PET probe targeting fibroblast-activated protein inhibitors is promising and might be a widely applicable tumour screening tool in the oncology clinic," commented Hisataka Kobayashi (National Cancer Institute, Bethesda, MD, USA). "The next step would be specificity of this probe, especially in differentiating cancers from chronic inflammatory or degenerative diseases…that involve activated fibroblasts."

Elizabeth Gourd



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For the **study by Kratochwil and colleagues** see *J Nucl Med* 2019; **60:** 801–805