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INNER SPACES
Edited by Dr. Bhavin Jankharia

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The Impact of 68Ga-FAPI-PET/CT

For a long time, the only molecule available for PET/CT has been FDG, or fluorodeoxyglucose. FDG-PET has revolutionized oncology imaging and management. DOTATOC has been available for a decade for neuroendocrine tumors and for the last 3-4 years, PSMA for prostate cancer.

68-gallium labelled fibroblast-activation protein inhibitor (68Ga-FAPI, called FAPI-PET for short) is a new addition. It targets cancer-associated fibroblasts, unlike FDG, which accumulates in areas with increased glucose activity. In many tumors such as signet cell carcinomas of the stomach or colon, serous adenocarcinomas of the ovary, primary pancreatic adenocarcinomas, biliary carcinomas, soft tissue sarcomas and even renal cell carcinomas, which are not particularly FDG avid, FAPI has been shown to be more sensitive and specific for identifying the presence or absence of tumor.

Since fibroblast activation protein is also expressed in non-cancerous cells, FAPI-PET is also useful in the evaluation of inflammation and infiltration including amyloidosis. It has also been used to stage liver fibrosis in an animal model of chronic liver disease.

FAPI-PET will continue to evolve over the next decade or so as more and more trials and studies are done and published.

Here is one example of the impact of FAPI-PET in a 65-years old patient treated earlier for serous papillary adenocarcinoma of the ovary (Figs. 1-3). She had rising tumor markers. The FDG-PET (Fig 1) showed disease over the sigmoid colon that could not be biopsied under CT guidance. A FAPI-PET (Fig. 2) done the next day also showed disease along the right lateral wall of the cecum. A biopsy of this area was simple (Fig. 3) and showed recurrence.

In this patient, FAPI-PET showed the disease extent better than FDG-PET, helped plan a successful biopsy and changed the management plan.

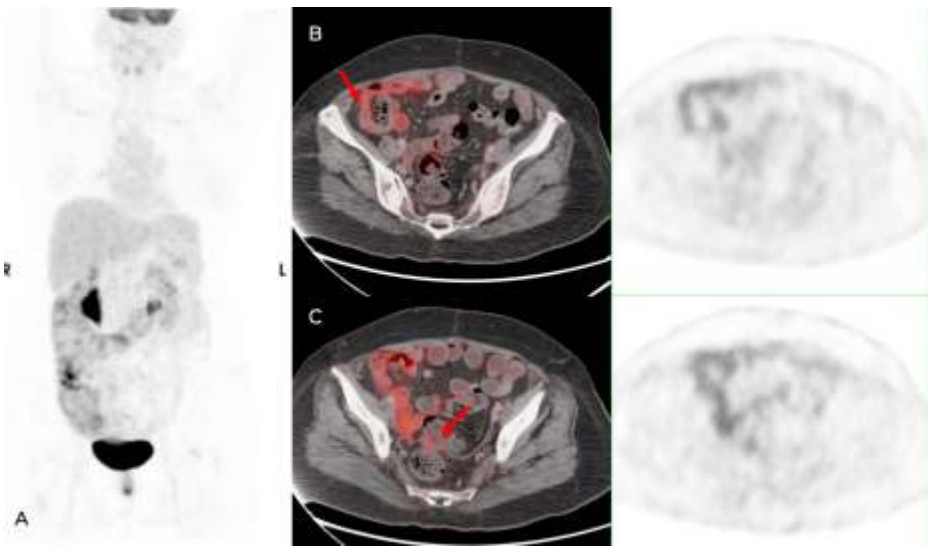

Fig. 1 (A-C): FDG-PET/CT. Whole body PET image (A) shows no obvious focus of uptake, while the axial images (B, C) show subtle uptake along the right lateral wall of the cecum (arrow in B) and one focus of abnormal soft tissue with uptake along the surface of the sigmoid colon (arrow in C).

At a glance:

- Fibroblast-activation protein inhibitor (FAPI) tagged with 68-gallium (68Ga-FAPI-PET) is a new molecule for PET/CT.
- FAPI accumulates in cancer-associated fibroblasts as well as in areas of inflammation and infection that also express fibroblasts.
- FAPI-PET has been shown to be more sensitive and specific than FDG-PET for the presence or absence of disease in many tumors that show low uptake on FDG-PET, such as signet cell adenocarcinomas, hepatobiliary carcinomas, etc.

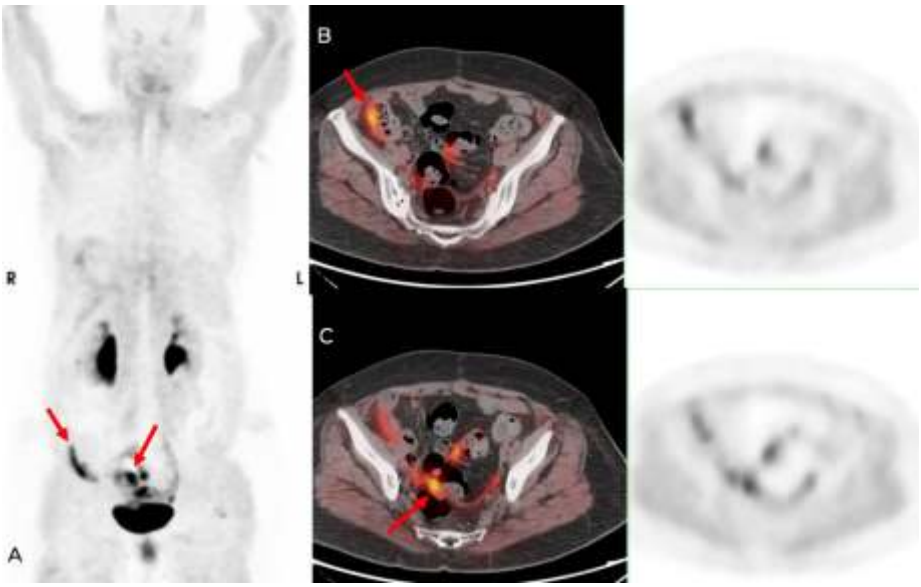

Fig. 2 (A-C): FAPI-PET/CT. Whole body PET image (A) shows foci of uptake in the right lower abdomen and the pelvis (arrows). Marked uptake is seen along the right lateral wall of the cecum (arrow in B). The abnormal soft tissue on the surface of the sigmoid colon (arrow in C) also shows much more uptake than on the FDG-PET.

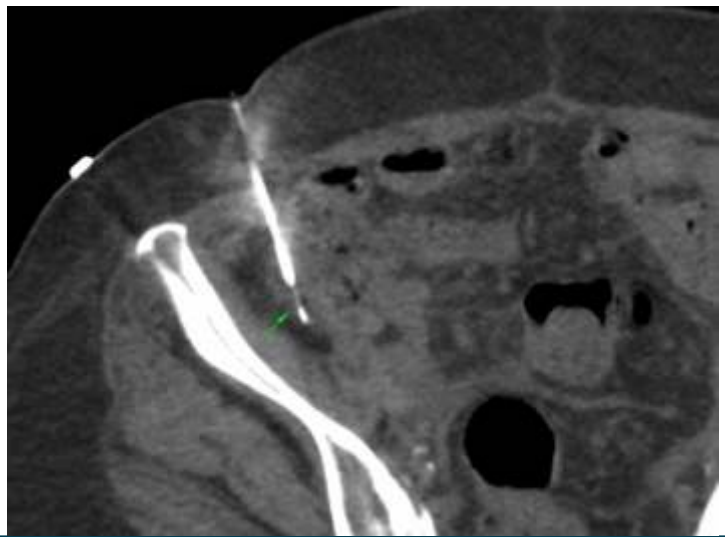

Fig. 3: CT-guided biopsy (arrow) of the soft tissue along the right lateral wall of the cecum.

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Main Clinic
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