[68 Ga]Ga-FAPi PET/CT vs [18F]F-FDG PET/CT IN VARIOUS CANCERS: INITIAL EXPERIENCE

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Background and Aim

The microtumour environment in over 90% of epithelial cancer has cancer associated fibroblasts (CAF) which are involved in tumour progression. CAFs express fibroblast activated protein (FAP) a type II transmembrane protein which is a target of FAP inhibitors (FAPi). We aim to evaluate the uptake of [68Ga] Ga-FAPI versus [18F] F-FDG on PET/CT the current standard for imaging in various tumours.

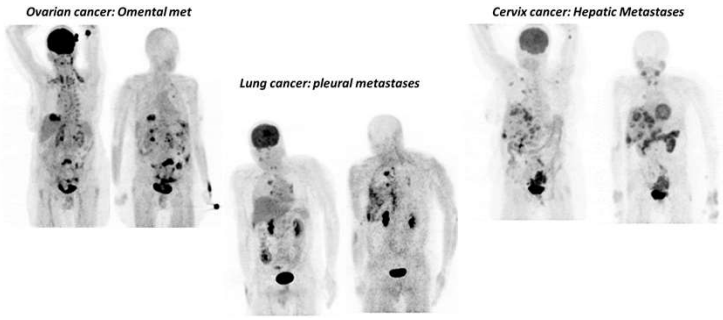

Figure 1: .Demonstrates higher tracer avidity for FAPi on the right vs FDG on the Left for omental, pleural and hepatic metastases.

Methods

Patients with various malignancies were prospectively evaluated with FDG and FAPi. Lesions were grouped into visceral; lymph node and skeletal. For each patient and each lesion group the total number of lesions and highest SUVmax were recorded.

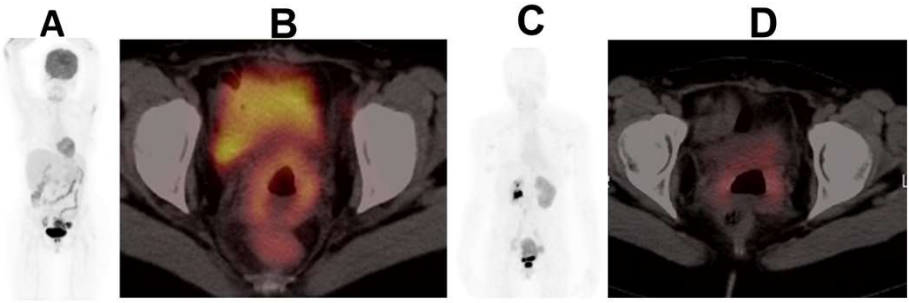

Figure 2: FDG PET(A and B) rectal uptake is noted. This is equivocal and may be inflammatory or local/rectal cervical cancer invasion whereas FAPi(C and D) demonstrates rectal sparing and may be useful in ruling-out local/rectal invasion.

Results

Sixteen patients had FDG and FAPi PET/CTs for initial, restaging and primary/biopsy site assessment. (Female: Male-12:4;Age: Mean:55years and range:35-74), mean injected activities 325.6MBq and 146,15MBq respectively. 5 patients had breast; 3 cervix, 1 paraneoplastic syndrome and 1 each for nasopharyngeal, lung, esophageal, lymphoma, colon, ovarian cancers and melanoma.

FDG showed the highest number of lymph nodes and skeletal lesions compared to FAPi (72vs57) and (56vs37) respectively. Visceral lesions were higher with FAPi than FDG (87vs75). Highest SUVmax for lymph nodes was on FDG (mean:12.6 Range3.27-24.76) vs (Mean:6.91 and Range:3.7-11.44) for FAPi. Except for lymphoma concordance or more nodes were seen on FAPi. For the skeleton, SUVmax was higher for FDG than FAPi (mean:10.89 Range 4.09-25.37) vs (Mean:7.86 and Range3.95-12.08:). Viscera with the highest SUVmax was on FDG (mean:12.93 Range3.56 - 27.22) vs (Mean:10.7 and Range1.72- 26.79 for FAPi).

Despite the higher SUVmax in FDG; FAPi images demonstrated higher tracer avidity and were easily identified. This was true for pleural, lung, omental, and liver metastases. FAPi ruled-out rectal infiltration in cervical cancer where FDG was equivocal.

Conclusion

This study therefore demonstrates the complementary role and increased diagnostic accuracy of FAPi in various primary cancers; and metastases especially pleural, lung, omental and liver.

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