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Letter to the Editor:

Non-alcoholic Steatohepatitis Mimicking Solitary Liver Metastasis

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FDG PET-CT has become a commonly used functional imaging modality in the staging of a number of tumor types. Liver is one of the most common sites of metastasis for tumors arising from pancreas, gastrointestinal tract, lung and breast, and the presence of hepatic metastasis will often substantially alter treatment plans. Whilst malignant liver lesions are typically FDG-avid, benign lesions can also be a cause of false-positive findings.

A 41 year old female with pancreatic adenocarcinoma underwent a PET-CT after completing chemoradiotherapy for re-staging and reconsideration for possible operative treatment.

The PET-CT demonstrated that whilst there had been a reduction in the avidity of the primary pancreatic head malignancy, there was however a new hyperdense wedge shaped geographic lesion in hepatic segment V with moderate to intense avidity (Figure 1) with slightly reduced hepatic avidity elsewhere. The FDG component of the study was concerning for a solitary segment V metastasis, however on review of the CT component, it showed a severely fatty liver, with the wedge shaped area being slightly higher density but still lower in density than spleen and muscle, with normal hepatic blood vessels transversing it without any architectural distortion, with appearances thus atypical for metastasis.

The patient proceeded to resection and at the time of operation a wedge biopsy of segment 5 was taken, with the histopathology demonstrating NASH (non-alcoholic steatohepatitis).

There is a pandemic of non-alcoholic fatty liver disease (NAFLD) with over 5 million Australians affected, a significant minority of which will develop NASH. While NAFLD is usually a diffuse process, multifocal forms and mass like lesions are frequently encountered, and thus it follows multifocal NASH will also occur. These are usually encountered on CT as focal hypodense lesions characterised by absent mass effect and often with a perivascular distribution, however MRI with chemical shift imaging has higher sensitivity and specificity.

The available literature assessing the relationship between hepatic FDG uptake and the spectrum of NAFLD is still fairly scant, however there is evidence that FDG uptake in NASH is higher than in normal livers due to irreversible FDG uptake in inflammatory cells¹, whilst it is suggested that the hepatic FDG uptake in NAFLD may vary depending on the steatosis severity, explaining our constellation of PET-CT appearances.² However interestingly, contradictory findings have been described including a recent study using dynamic PET-CT showing that FDG transport from blood to hepatic tissue was reduced in NASH³, whilst another recent study which utilised labelled galactose, also showed that NASH was less metabolically active than either simple steatosis or healthy controls.⁴

This case provides an important example of a false positive finding on the FDG PET-CT due to non-alcoholic steatohepatitis mimicking a solitary liver metastasis. As FDG PET-CT is increasingly being utilised for staging, it is therefore vital that radiologists and nuclear medicine physicians are aware that focal forms of NASH can mimic hepatic tumours and metastases. In these cases a close inspection of the CT component of the PET to assess the density and signs of mass effect is vital to raise the possibility of this benign diagnosis.

Lee, S-F, Schlicht, S. & Sutherland, T.

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Figure 1: FDG PET-CT of patient with pancreatic adenocarcinoma and NASH.

