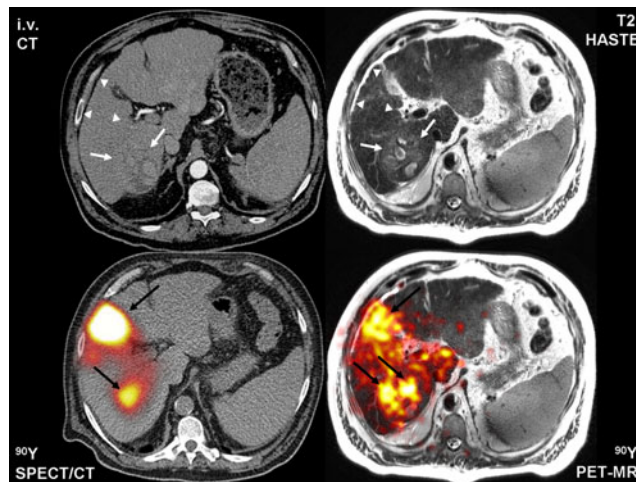


## $^{90}\text{Y}$ Time-of-flight PET/MR on a hybrid scanner following liver radioembolisation (SIRT)

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Several studies have reported on the use of high-resolution  $^{90}\text{Y}$  PET/CT scans in the evaluation of the biodistribution of  $^{90}\text{Y}$ -labelled glass or resin based microspheres after radioembolisation of malignant liver lesions [1–4]. PET/MR is an emerging technology providing particularly high soft tissue contrast and no inherent radiation exposure. A 67-year-old man with multifocal unresectable hepatocellular carcinoma was referred for selective internal radiation therapy (SIRT). The pretreatment management consisted of angio-CT of the liver, embolisation of the right gastric and gastroduodenal arteries followed by  $^{99\text{m}}\text{Tc}$ -MAA SPECT/CT. Two weeks later, 4.3 GBq of  $^{90}\text{Y}$ -labelled TheraSpheres® (MDS Nordion, Kanata, Canada) were administered in a single bolus into the right liver lobe. Subsequently, the patient



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underwent integrated  $^{90}\text{Y}$  bremsstrahlung SPECT/CT on a Symbia T6 hybrid scanner (Siemens, Erlangen, Germany) equipped with a medium-energy collimator. The energy peak was set at 90 keV with a 30% window. SPECT data were reconstructed using the FLASH 3-D algorithm (4 iterations, 8 subsets). PET/MR was obtained on a Philips Gemini TF PET/MR. PET scanning (one bed position centred on the liver) lasted for 30 min; the MR protocol consisted of a 3-D T1 FFE sequence (TE=2.3 ms, TR=4.1 ms, voxel size=3×3×6 mm) for anatomical correlation and attenuation correction, and axial as well as coronal T2 HASTE sequences (TE=136 ms, TR=2,351 ms, voxel size=1.2×1×5mm). The PET data were reconstructed using a 3-D line-of-response time-of-flight (TOF) blob-based algorithm (3 iterations, 33 subsets) with a voxel size of 4×4×4 mm<sup>3</sup>. MR allowed better lesion visualisation than contrast-enhanced CT (white arrows and arrowheads); PET/MR provided sharper lesion to background contrast and discrimination than SPECT/CT (black arrows).

**Conflicts of interest** None.

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