Noninvasive Characterization of Hepatic Lesions by Means of Glypican-3–Directed PET/CT

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Glypican-3 (GPC-3) is a cell-surface heparan sulfate proteoglycan that is preferably overexpressed in hepatocellular carcinoma (HCC). Thus, it serves to differentiate HCC from other benign or malignant hepatic lesions (*1*–*3*). Recently, a selective GPC3-targeting peptide radiolabeled with ^{68}Ga (^{68}Ga-RAYZ-8009) demonstrated both favorable preclinical properties as well as promising results for the noninvasive detection of HCC in a pilot human study (*4*,*5*).

We report on 2 patients who underwent ^{68}Ga-RAYZ-8009 PET/CT (140 and 113 MBq; 20 μg; imaging 120 min after injection) for noninvasive characterization of new liver lesions. In a 60-y-old patient with a history of hepatitis C, significant tracer accumulation (SUV_{max}, 140) of the hepatic lesion in segment VIII was recorded (Fig. 1, blue arrows), highly consistent with HCC. In addition, a second highly ^{68}Ga-RAYZ-8009 PET-positive focus in segment IV (SUV_{max}, 115) was visualized (dotted blue arrows). (Immuno)histopathologic work-up of the lesion in segment VIII confirmed the diagnosis of grade 2 HCC with strong cytoplasmatic and even focally strong membranous GPC-3 expression of the tumor cells (H-score, 280).

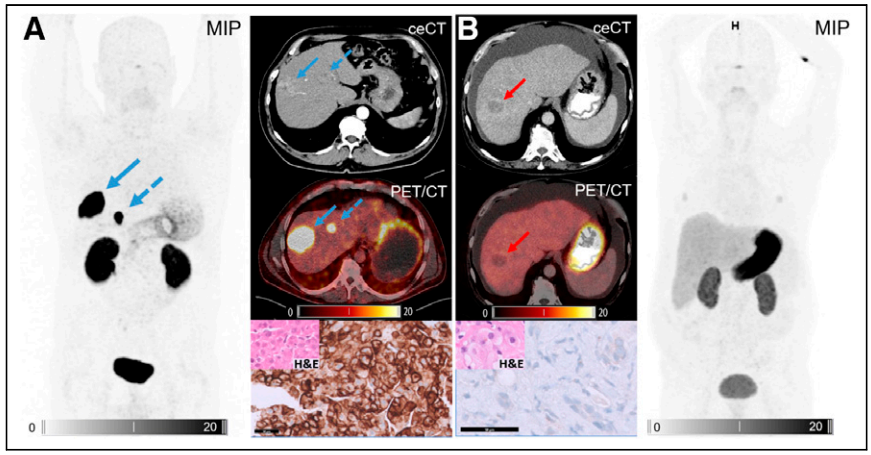

FIGURE 1. Maximum-intensity projections (MIP), transaxial slices of contrast-enhanced CT (ceCT; top rows), fused ^{68}Ga-RAYZ-8009 PET/CT (middle rows), and hematoxylin and eosin (H&E) and immunohistochemical staining for GPC-3 (bottom rows) are presented. Whereas grade 2 HCC presents with significant radiotracer accumulation (A, blue arrows), no increased uptake is detected in liver metastases of choroidal melanoma (B, red arrows). Immunohistochemical staining confirmed imaging findings with strong GPC-3 expression of HCC, contrasted by GPC-3–negative melanoma. Intensity scale bars are SUV.

In contrast, in a 66-y-old man with a history of liver cirrhosis, various hepatic lesions that were negative in ^{68}Ga-RAYZ-8009 PET/CT (Fig. 1B, red arrows) could be proven to be metastases of choroidal melanoma.

In conclusion, the noninvasive characterization of HCC versus non-HCC lesions by means of ^{68}Ga-RAYZ-8009 PET/CT might be feasible. Further prospective studies to investigate the potential of ^{68}Ga-RAYZ-8009 PET/CT in the differential diagnosis and diagnostic work-up of HCC are warranted, especially given the fact that GPC-3 is also expressed by other gastrointestinal malignancies metastasizing to the liver (*6*).

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from the patient reported in this case report.

DISCLOSURE

Constantin Lapa reports prior consulting activities for Blue Earth Diagnostics Ltd. (Oxford, U.K.) and Novartis. Ralph Bundschuh is a consultant for and has received speaker's honoraria from Bayer Healthcare (Leverkusen, Germany) and Eisai GmbH (Frankfurt, Germany). Helen Scholtissek received travel support from Boston Scientific Medizintechnik GmbH. The precursor was provided by RayzeBio, Inc. No other potential conflict of interest relevant to this article was reported.

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