

^{18}F -FDG PET/CT demonstrated diffused ^{18}F -FDG uptake in the liver, spleen and bone marrow in a diffuse large B cell lymphoma patient with a false interpretation of the liver on abdominal MRI

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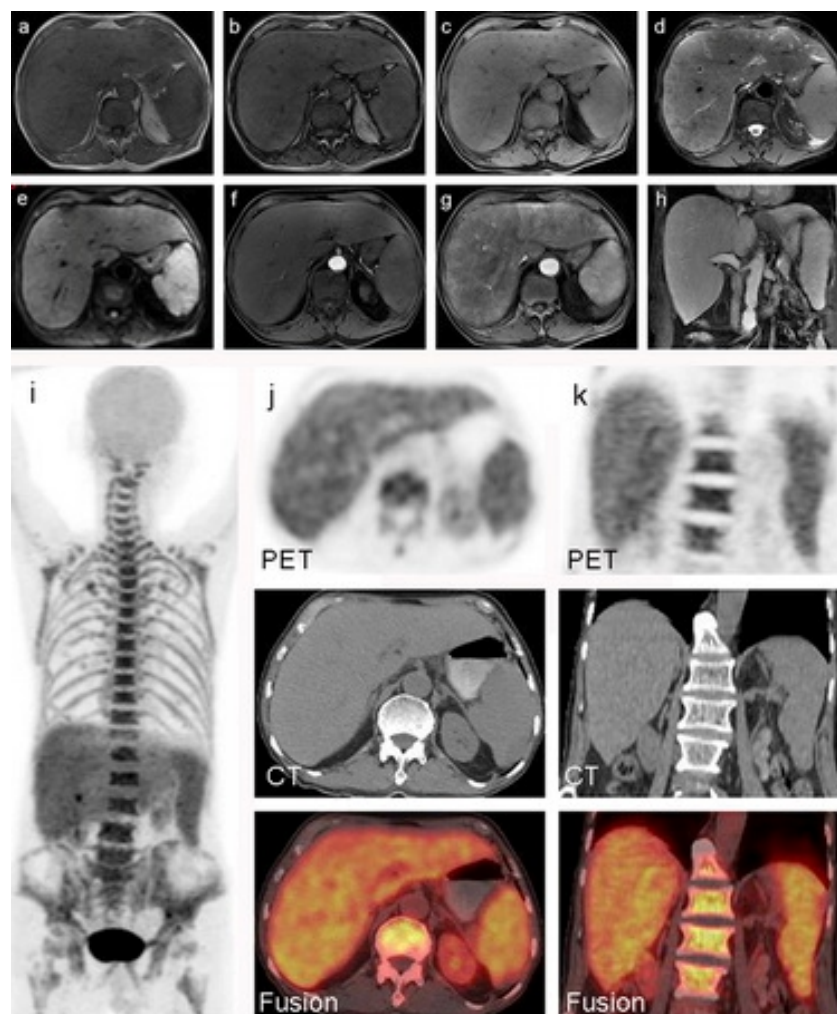


Figure. A 82-year-old man was hospitalized due to a fever of unknown origin and upper abdominal pain for one month. Tumor markers, including alpha-fetoprotein (AFP), were negative. He had a history of hepatitis B for two years. Abdominal magnetic resonance imaging (MRI) was performed, T1WI in-phase (a) was normal, and no signal drop was identified in the tumor on the out-phase compared with the in-phase of chemical shift imaging (b). T1WI (c) demonstrated the liver was enlarged, and no abnormal signal was found. T2WI (d) showed diffusely infiltrated hypo-intensity lesions slightly throughout the liver. No high signal intensities were found on diffusion-weighted imaging ($b=800\text{s}/\text{mm}^2$) (e). After administration of gadolinium-diethylenetriamine pentaacetic acid (Gd-DTPA), these lesions had no contrast agent accumulation in the early arterial phase (f), late arterial phase (g) and portal venous phase (h). Meanwhile, MRI showed splenomegaly, but no abnormal signal was found in each sequence. These findings had suggested the possibility of liver cirrhosis with diffuse hyperplastic nodules. Because a routine diagnostic workup of fever of unknown origin could not lead to an etiologic diagnosis, a fluorine-18-fluorodeoxyglucose positron emission tomography/computed tomography (^{18}F -FDG PET/CT) scan was performed to detect the underlying cause. The maximum intensity projection (MIP) image (i) demonstrated intense ^{18}F -FDG uptake in the liver, spleen and bone marrow, and no hypermetabolic lymph nodes were found. The transverse images (j) and the coronal images (k) revealed enlargement of the liver and spleen with diffuse abnormal ^{18}F -FDG uptake (liver, $\text{SUV}_{\text{max}}=7.2$; spleen, $\text{SUV}_{\text{max}}=7.1$), suggesting the possibility of lymphoma infiltrating the liver, but diffuse spleen and bone marrow uptake may be caused by lymphoma or other reasons (for example, fever). Pathological biopsies of the liver and bone marrow were performed, both confirmed infiltration by the diffuse large B-cell lymphoma (DLBCL). The patient then underwent treatment with a total of eight courses of R-CHOP (rituximab, cyclophosphamide, Adriamycin, vincristine, and prednisolone) therapy and achieved complete remission.

The hepatic lymphoma can appear as a solitary lesion (39%-60%), as multiple lesions (25%-40%), or as diffuse infiltration of the liver [1]. Establishing a diagnosis of lymphoma liver can be challenging clinically. While abdominal MRI is valuable in the evaluation of hepatic lymphoma, diagnosis is also challenging in atypical cases [2]. The MRI features of lymphoma or liver are referred to as non-specific. Classically, the MRI findings of hepatic lymphoma have been described as hypointense or isointense on the T1WI, hyperintense on T2WI, a signal restriction in the DWI, and exhibited slight to moderate enhancement with a dynamic contrast-enhanced protocol [2]. Fluorine-18-FDG PET/CT is a mature imaging modality in evaluating diffuse large B-cell lymphoma and Hodgkin's lymphoma, which generally shows a significant increase in ¹⁸F-FDG uptake [3, 4]. In this case, our patient showed atypical findings on MRI with diffusely infiltrated slightly hypo-intensity lesions throughout the liver on T2WI, but other sequences, including DWI and enhanced sequences, were normal. These findings were not consistent with the typical characteristics of lymphoma of the liver, while ¹⁸F-FDG uptake was diffusely intense, and the diagnosis was simple on ¹⁸F-FDG PET/CT.

The authors declare that they have no conflicts of interest.

Bibliography

1. Cerban R, Gheorghe L, Becheanu G et al. Primary focal T-cell lymphoma of the liver: a case report and review of the literature. *J Gastrointest Liver Dis* 2012; 21:213-6.
2. Colagrande S, Calistri L, Grazzini G et al. MRI features of primary hepatic lymphoma. *Abdom Radiol (NY)* 2018; 43: 2277-7.
3. Cheson BD, Fisher RI, Barrington SF et al. Recommendations for initial evaluation, staging, and response assessment of Hodgkin and non-Hodgkin lymphoma: the Lugano classification. *J Clin Oncol* 2014; 32: 3059-8.
4. Barrington SF, Mikhaeel NG, Kostakoglu L et al. Role of imaging in the staging and response assessment of lymphoma: consensus of the International Conference on Malignant Lymphomas Imaging Working Group. *J Clin Oncol* 2014; 32: 3048-8.

JingXing Xiao MD, Dong Wang BD, Jing Ye BD, ChengMao Guo MD, ShiSang Huang BD, Min Su BD

Department of Nuclear Medicine, Affiliated Hospital of Guangdong Medical University, No. 57 Ren-min South Road, Xiashan District, ZhanJiang, Guangdong Province, People's Republic of China

Corresponding author: Dong Wang, BD, Department of Nuclear Medicine, Affiliated Hospital of Guangdong Medical University, No. 57 Ren-min South Road, Xiashan District, ZhanJiang, Guangdong Province, People's Republic of China. Phone: 86-13553568933. Email: 13553568933@126.com

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