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Interesting Image

PET/CT에서 간전이로 오인되었던 호산구성 간농양의 F-18 FDG 섭취 증가

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F-18 FDG Uptake in an Eosinophilic Liver Abscess Mimicking Hepatic Metastasis on PET/CT Images

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A 61-year-old man had a F-18 FDG PET/CT scan for evaluation of a common bile duct cancer identified on CT. The PET/CT image showed a hypermetabolic mass in the common bile duct, and a focal area of increased F-18 FDG uptake in segment IV of the liver, which corresponded to a hypoattenuated lesion on non-enhanced CT, and was consistent with hepatic metastasis. The patient underwent choledochojejunostomy with hepatic resection, and pathologic findings were compatible with an eosinophilic abscess in the liver. This case demonstrates that F-18 FDG uptake by an eosinophilic abscess can mimic hepatic metastasis in a patient with a malignancy. (Nucl Med Mol Imaging 2008;42(3):253-255)

Key Words: liver, eosinophilic abscess, metastasis, F-18 FDG, PET/CT

An eosinophilic liver abscess is a disease with an eosinophilic infiltration and microabscess formation in the liver and can occur in various conditions, such as parasitic infestations, allergic reactions, malignant neoplasms, drug hypersensitivities, and the hypereosinophilic syndrome.[1)] In patients with a malignant neoplasm, many reports have described its occurrence in gastric cancer[2-5)]; however, has very rarely been associated with bile duct cancer.[6)] An eosinophilic liver abscess is most commonly associated with peripheral eosinophilia.[1,5,7)] Several reports have suggested that eosinophils are aggregated into the liver by the eosinophilic chemotactic factor, which is released from the primary cancer cell and is then transported into the liver.[4,6)] Eosinophils infiltrate in a perivascular region, predominantly in the periportal space. Although the precise mechanism of eosinophilic-related liver damage are not fully understood, the process might occur as follows: infiltration of esosinophils into tissue, damage related to eosinophil function and products (e.g., the eosinophil major basic protein and eosinophil cationic protein), and occurrence of thromboembolic phenomena.[8)] In particular, these hepatic lesions may be confused with metastasis in patients with primary malignancies.[9-12)]

F-18 FDG PET/CT imaging has been well accepted in oncology as an effective modality in the diagnosis, staging, post-treatment monitoring, and detection of recurrence for a number of malignancies. F-18 FDG accumulates in cancer cells due to the increased glucose metabolism of the cancer cells, but it is not a tumor-specific agent. F-18 FDG is also known to accumulate in inflammatory cells infiltrating various inflammatory and infectious lesions, such as lymphocytes, neutrophils, and macrophages, which have elevated glucose requirements.[13,14)] Moreover, FDG uptake by infectious and inflammatory lesions may cause false-positive

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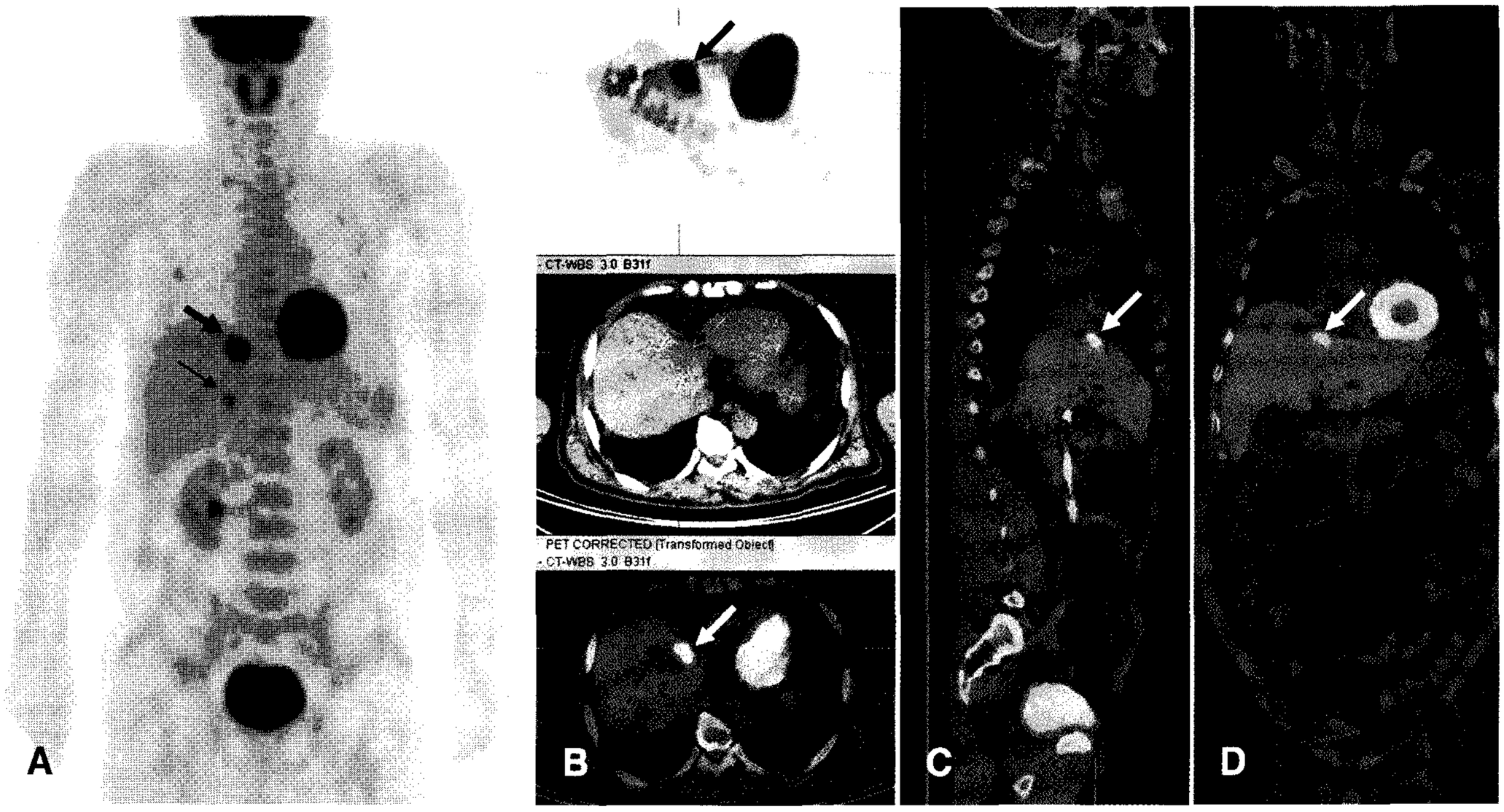

Figure 1. A 61-year-old man had a F-18 FDG PET/CT scan for evaluation of a common bile duct cancer. (A) The maximum-intensity-projection image demonstrated a focal hypermetabolic mass in the common bile duct (thin arrow) and an additional hypermetabolic lesion in the liver (thick arrow). (B) Transverse (upper panel, PET images; middle panel, non-enhanced CT; lower panel, PET/CT combined images), (C) sagittal, and (D) coronal images showed a focal area of hypermetabolism in segment IV of the liver (size, 3 x 2 cm; mSUV, 8.73 (black and white arrows)), corresponding to the hypoattenuated lesion (open arrow) on the non-enhanced CT scan that was consistent with metastatic disease. The patient underwent choledochojejunostomy with hepatic resection; the pathologic findings revealed adenocarcinoma in the bile duct and an eosinophilic liver abscess without cancer cells. Laboratory examination showed peripheral blood eosinophilia (4,640 WBC/㎕ with 21.1% eosinophils). The total serum IgE level was elevated (307.4 IU/ml)

results when performing evaluations for metastatic disease in cancer patients. On histopathologic assessment, an eosinophilic liver abscess refers to a lesion comprised of massive eosinophils and destruction of the liver parenchyma with inflammation.4) Therefore, FDG uptake can occur in an eosinophilic liver abscess. It is important to be aware of this condition mimicking metastasis when interpreting PET/CT images in patients with a primary malignancy.

References

1. Lee WJ, Lim HK, Lim JH, Kim SH, Choi SH, Lee SJ. Foci of eosinophil-related necrosis in the liver: imaging findings and correlation with eosinophilia. ***AJR Am J Roentgenol*** 1999;172:1255-61.
2. Iwasaki K, Torisu M, Fujimura T. Malignant tumor and eosinophils. I. Prognostic significance in gastric cancer. ***Cancer*** 1986;15:1321-27.
3. Hong SW, Cho MY, Park C. Expression of eosinophil chemotactic factors in stomach cancer. ***Yonsei Med J*** 1999;40:131-6.
4. Hong SW, Kim HE, Park CI, Lee SI. Eosinophilic liver abscess in patients with gastric carcinoma. ***Korean J Pathol*** 1993;27:27-33.
5. Yoo SY, Han JK, Kim YH, Kim TK, Choi BI, Han MC. Focal eosinophilic infiltration in the liver: radiologic findings and clinical course. ***Abdom Imaging*** 2003;28:326-32.
6. Kang HR, Kwon HS, Song WJ, Lee SM, Kim TB, Park HK, et al. Analysis of 54 cases of eosinophilic liver abscess-underlying diseases and clinical characteristics. ***Korean J Asthma, Allergy Clin Immunol*** 2004;24:229-35.
7. Jang JK, Bak SW, Choi MS, Lee JH, Ko KC, Chae KS, et al. Clinical characteristics of 19 cases of biopsy-proven eosinophilic liver abscess: single cencer experience. ***Korean J Gatroenterol*** 2001;38:37-41.
8. Fauci AS, Harley JB, Roberts WC, Ferrans VJ, Gralnick HR, Bjornson BH. NIH conference. The idiopathic hypereosinophilic syndrome. Clinical, pathophysiologic, and therapeutic considerations. ***Ann Intern Med*** 1982;97:78-92.
9. Won JH, Kim MJ, Ji H, Chung JJ, Yoo HS, Lee JT, et al. Focal eosinophilic infiltration of the liver: a mimick of hepatic metastasis. ***Abdom Imaging*** 1999;24:369-72.
10. Hur J, Park MS, Yu JS, Lim JS, Hong SW, Kim KW. Focal eosinophilic necrosis versus metastasis in the liver: The usefulness of two-phase dynamic CT. ***AJR Am J Roentgenol*** 2005;184:1085-90.
11. Jang HJ, Lee WJ, Lee SJ, Kim SH, Lim HK, Lim JH. Focal eosinophilic necrosis of the liver in patients with underlying gastric or colorectal cancer: CT differentiation from metastasis. ***Korean J Radiol*** 2002;3:240-4.
12. Byun JH, Yang DH, Yoon SE, Won HJ, Sin YM, Jeong YY, et al.

Contrast-enhancing hepatic eosinophilic abscess during the hepatic arterial phase: a mimic of hepatocellular carcinoma. ***AJR Am J Roentgenol*** 2006;186:168-73.

13. Fantone JC, Ward PA. Role of oxygen-derived free radicals and metabolites in leukocyte-dependent inflammatory reactions. ***Am J Pathol*** 1982;107:395-418.
14. Weisdorf DJ, Craddock PR, Jacob HS. Glycogenolysis versus glucose transport in human granulocytes: differential activation in phagocytosis and chemotaxis. ***Blood*** 1982;60:888-93.