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Letter to the Editor

The evolving role of PET/CT in fever of unknown origin

All patients included in this study met the revised definition criteria for fever of unknown origin (FUO): a temperature greater than 38 °C (101 °F) on several occasions, a duration of illness of more than 3 weeks, and no identified diagnosis after adequate inpatient or outpatient evaluation.[1] In clinical practice, we tailored the published guidelines for clinical cases. Eventually positron emission tomography/computed tomography (PET/CT) was used at the discretion of the physician as part of clinical practice. In the case of normal or misleading results from a series of investigations, the patient underwent a PET/CT.

The first acute myeloid leukemia (AML) patient, whose images were provided in Figure 1 in the original article,[2] was referred from abroad with long-term non-specific symptoms including fever, fatigue, weight loss, shortness of breath, anemia, and non-specific skin lesions, which had previously been evaluated by a dermatologist and evaluated as non-specific. As seen in the images provided,[2] only some of the lesions were metabolically detectable and the most hypermetabolic lesion was picked out to guide biopsy. We experienced a similar clinical scenario with the second patient with AML (Figure 1A). ^{18}F-Fluorodeoxyglucose (FDG)-PET/CT was particularly helpful in the early diagnosis of these challenging patients through monitoring ^{18}F-FDG in the skin lesions, lymph nodes, and bone marrow. The second patient's images was also provided.[2]

PET/CT may be useful for detecting focal localizations in patients with leukemia. The prevalence of extramedullary disease (EMD) in AML at the time of diagnosis is unknown and often remains a diagnostic challenge. Previous estimates range from 2.5% to 30.5% and are usually based on clinical examination. This may result in an under-diagnosis of EMD, as not all extramedullary manifestations are easily detectable.[2] For these patients, we can consider waiting for a period of time until the skin lesions worsen and therefore become more easily identifiable for diagnosis. But should we, in the era of advanced diagnostic technology?

The third patient, who was diagnosed with tuberculosis, had a complicated clinical history with a severe illness, besides the FUO. She had pleural effusion, continuous peritoneal dialysis, and recent weight loss. Standard clinical investigations did not reveal a definite diagnosis but raised a strong suspicion that the patient had a malignancy with an unknown primary source. Tuberculosis was considered in the differential diagnosis of this patient; however, several factors that usually occur in immunocompromised patients prevented localizing signs of disease. Despite several CT studies, findings pathognomonic of tuberculosis were not detected. Then, during an exploration of the malignancy, PET/CT was performed, and the focus was detected in the mediastinum (Figure 1B). The final diagnosis was established by histological studies.

FUO can be caused by more than 200 infectious, neoplastic, inflammatory, immunological, and other conditions. Because of

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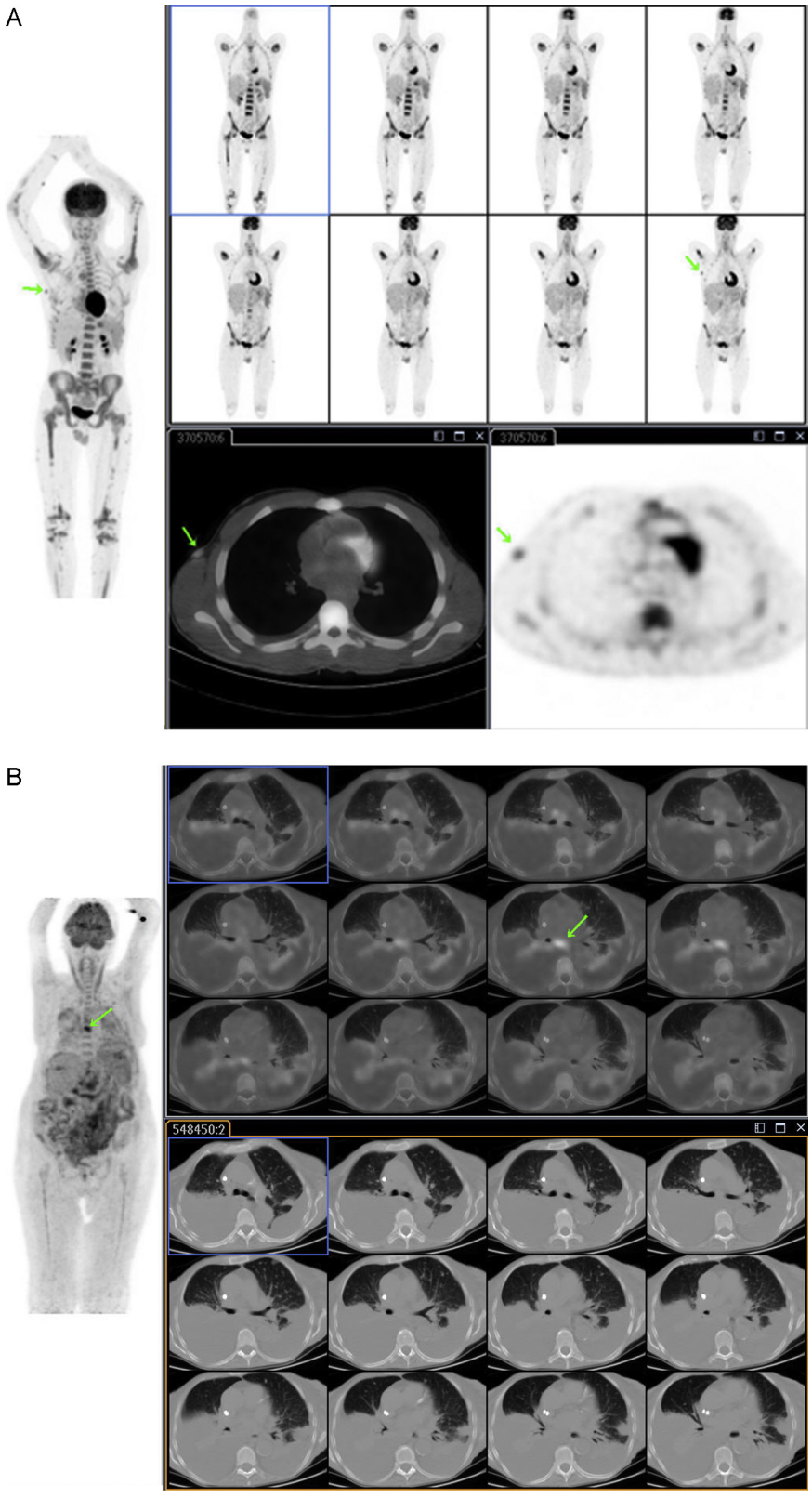

Figure 1. (A) ^{18}F-FDG-PET/CT images of a patient with a histologically established diagnosis of acute myeloid leukemia. (B) ^{18}F-FDG-PET/CT images revealing heterogeneous FDG activity in the bilateral lungs and increased ^{18}F-FDG uptake in the mediastinal lymph nodes.

the atypical presentation, the major problem is to localize the pathology. Imaging techniques such as CT scans and magnetic resonance imaging (MRI) that concentrate on one area of the body have limited value if there are no localizing signs or symptoms.

Conflict of interest: No conflict of interest to declare.

References

1. Ergonul O, Willke A, Azap A, Tekeli E. Revised definition of "Fever of Unknown Origin": limitations and opportunities. *J Infect* 2005;**50**:1–5.
2. Tokmak H, Ergonul O, Demirkol O, Cetiner M, Ferhanoglu B. Diagnostic contribution of ^{18} F-FDG-PET/CT in fever of unknown origin. *Int J Infect Dis* 2014;**19**:53–8.

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