Peripheral Tuberculous Lymphadenitis Masquerading as Metastatic Gastric Carcinoma on F-18 FDG Dual Time Point PET/CT

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A 59-year-old woman was hospitalized with weight loss, anorexia, and low grade fever for 2 weeks. She had undergone a total gastrectomy followed by adjuvant chemotherapy 10 years prior due to advanced gastric cancer. To evaluate recurrence, fluorine-18 fluorodeoxyglucose (FDG) dual time point positron emission tomography/computed tomography (DTPP) was conducted with a Gemini GXL 6 PET/CT system (Philips, Hamburg, Germany). FDG DTPP was performed twice, with an early scan 60 min after FDG injection and a delayed scan 150 min after FDG injection (Fig. 1a). The early scan showed that multiple hypermetabolic lesions were located along left supraclavicular, mediastinal (1R, 2R, 3, 4R and 7) and left paraaortic (retroperitoneal) nodal stations (Fig. 1b). The delayed scan showed that all the above mentioned lesions revealed a more increased maximal standard uptake value (SUVmax) than was detected in the early scan. Both scans did not show intrapulmonary lesion. For example, the left supraclavicular lymph node, 2R and retroperitoneal lymph node were observed with early and delayed SUV maxes of 4.5/7.7/3.6 and 6.7/10.7/4.4, respectively. To confirm diagnosis and establish a treatment plan, a mediastinoscopic biopsy of one of the mediastinal lymph

nodes (4R) was subsequently performed and tuberculosis was ultimately diagnosed. Then, the patient started an anti-tuberculosis treatment instead of antichemotherapy (Fig. 1c). A follow-up FDG PET/CT performed 12 months later showed disappeared FDG uptake and significant decreased change of multiple peripheral tuberculous lymphadenitis.

Whole-body FDG PET/CT has widespread use in diagnosing and staging variable malignancies, and plays an important role in detection of gastric cancer recurrence [1]. However, FDG is not cancer-specific and some inflammatory diseases have shown higher FDG uptake on PET imaging [2]. Infection, inflammation, and granulomatosis are also known to cause false positive FDG PET scans because activated inflammatory cells show avidity for FDG [3, 4]. So, for alternative measure differentiating malignancy from benign disease [5], early standard FDG PET/CT and delayed scan after early scan, namely FDG DTPP, has been introduced and often performed worldwide. FDG DTPP used the phenomenon that with time, FDG uptake in tumor tissues increases, while FDG uptake in normal or benign tissues decreases [5, 6]. Although FDG DTPP has been not accepted routinely, the retention index inferred from FDG DTPP predicted patient prognosis in lung cancer [7]. We had considered multiple hypermetabolic lymph nodes as metastasis rather than benign lymphadenopathies because of increased FDG uptake on the delayed scan versus the early scan, before pathologic results were confirmed. It is presumed that FDG DTPP could not help differentiate malignancy from benign diseases in cases of active infectious disease such as ongoing tuberculosis. Peripheral tuberculous lymphadenitis (PTL) is a common manifestation of extrapulmonary tuberculosis and remains an important cause of adenopathy globally [8, 9]. It was difficult for those lesions to be directly considered as PTL, because PTL manifestation mainly involves cervical chains and the supraclavicular region [8].

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Fig. 1 F-18 FDG dual time point PET/CT maximum intensity projection (MIP) images with (a) early scan and (b) delayed scan for ruling out recurrence, showing multiple systemic hypermetabolic lymph nodes. (c) Second MIP after antituberculosis treatment, demonstrating decreased metabolic change or partial disappearance of above-mentioned hypermetabolic lymph nodes

We demonstrate a rare FDG DTPP case showing PTL mimicking metastatic lymphadenopathies originated from advanced gastric cancer. Even if FDG DTPP showed increased FDG uptake on the delayed scan to be considered as suspicious metastasis, the possibility of active tuberculosis should always be kept in mind, especially in areas with epidemic granulomatous diseases.

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