^{18}F-FDG PET/CT imaging and curative effect evaluation of multiple muscular tuberculosis

Abstract

Tuberculosis continues to be a significant global health concern, impacting various parts of the body aside from the lungs. Muscular tuberculosis (MT), while rare, poses diagnostic hurdles due to its non-specific imaging features. Presenting a case of a 66-year-old man with multiple MT lesions, we underscore the vital contribution of positron emission tomography/computed tomography (PET/CT) in both diagnosis and treatment assessment. Fluorine-18-fluorodeoxyglucose (^{18}F-FDG) PET/CT imaging revealed hypermetabolism in bilateral chest and back muscles, facilitating accurate diagnosis and monitoring treatment response. This highlights the pivotal role of ^{18}F-FDGPET/CT in managing MT, especially in cases with multiple lesions.

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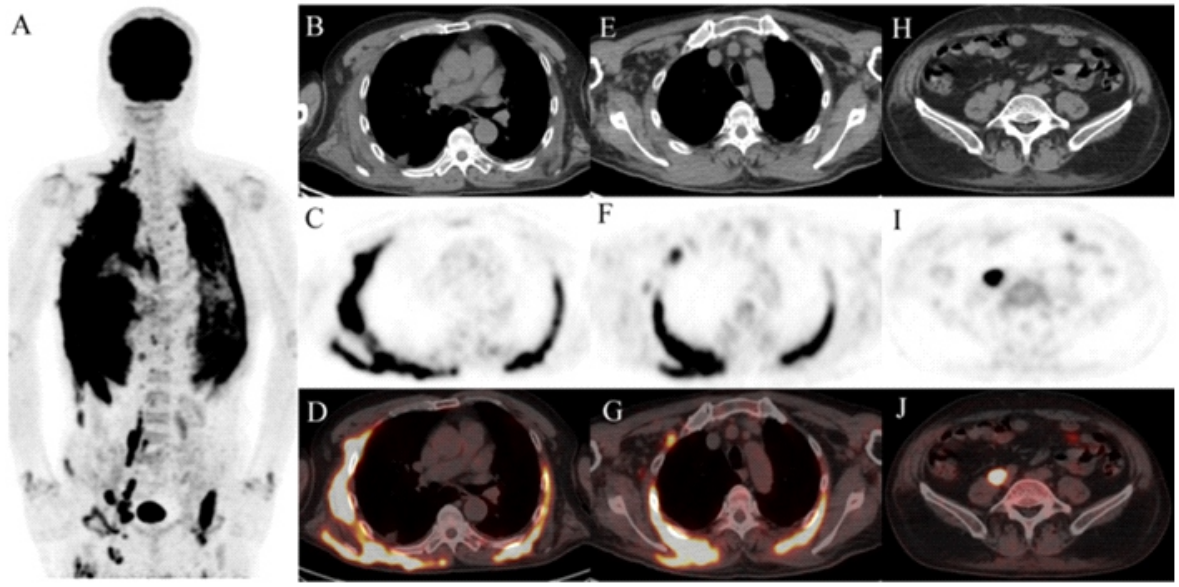

Figure 1. A 66-year-old male presented with sudden onset dizziness and headache, persisting for three days without any apparent triggers. His medical history included chronic atrophic gastritis and duodenitis diagnosed via gastroscopy. A chest CT scan revealed enlarged lymph nodes in the right axillary region and heterogeneous thickening of the right chest wall soft tissue. To further delineate the nature and extent of the lesions, ^{18}F-FDG PET/CT imaging was performed. The imaging revealed thickening and edema in the soft tissues and muscles of bilateral chest walls, abdominal walls, back, right pelvic wall, right neck, and upper parts of both thighs, with band-like and nodular increased radiotracer uptake (A-D, SUVmax18.0). Multiple metabolically active lymph nodes were observed in various regions including the right supraclavicular area, right axilla (E-G, SUVmax 5.9), mediastinum stations 6 and 8L, right internal mammary area, bilateral paraaortic feet, retroperitoneum (H-J, SUVmax 15.6), bilateral iliac vessels, and right inguinal area. Laboratory tests indicated elevated γ-glutamyltranspeptidase levels at 95U/L (normal range 10-60U/L), an unspecified enzyme level significantly increased to 317U/L (normal range 109-245U/L). The patient had anti-SSA-60 antibody levels of 2.14 (normal range 0-1) and anti-Jo-1 antibody levels of 8.30 (normal range 0-1).

Drawing from the case of a 66-year-old patient with multiple MT lesions, our research emphasizes the essential role of ^{18}F-FDG PET/CT for diagnosing and monitoring treatment progress in MT [1-2]. The utility of ^{18}F-FDG PET/CT in accurate diagnosis and treatment monitoring is particularly critical in cases with multiple lesions [3-4]. Moreover, MT's potential to mimic other diseases, such as malignancies, underscores the necessity for advanced imaging techniques to differentiate it from other conditions [5-6]. Our findings advocate for heightened clinical vigilance and the integration of clinical, imaging, and pathological data to enhance the diagnosis and management of MT, reflecting the need for multidisciplinary approaches in healthcare settings with varying access to advanced diagnostic tools.

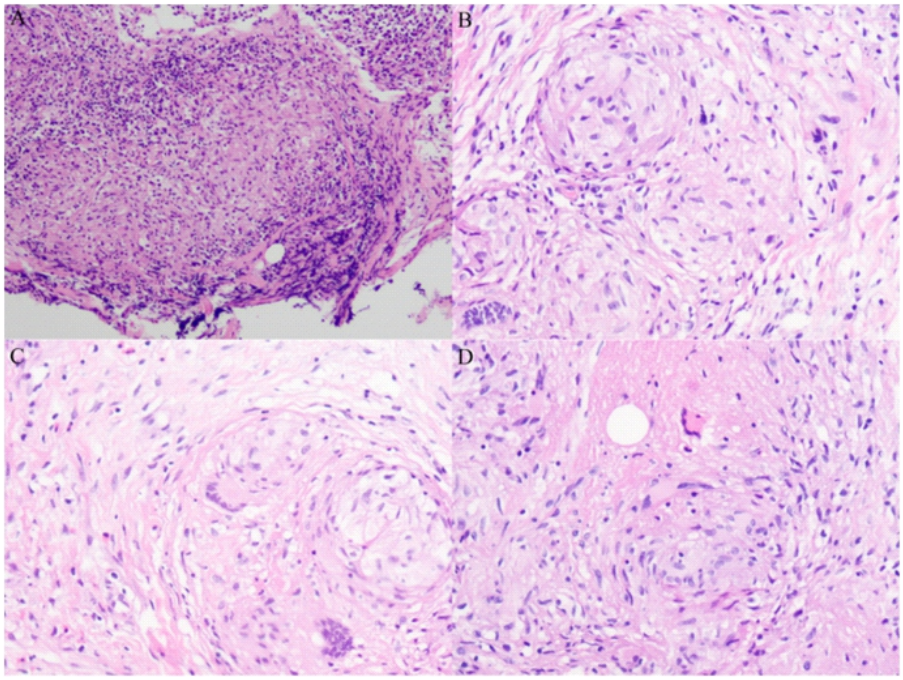

Figure 2. Biopsy of the right axillary lymph node revealed a large number of lymphocytes (Hematoxylin and Eosin stain×200), while biopsy of the right chest wall showed acute and chronic inflammatory cell infiltration in the fibrous connective and muscle tissues, granulomatous inflammation, and multinucleated giant cells, consistent with granulomas (B-D). Acid-fast staining of the chest wall aspiration tissue was positive, while PAS staining was negative. Detected mycobacterium tuberculosis DNA concentration was 2.349E+03 copies/mL (reference range: <5.00E+02 copies/mL).

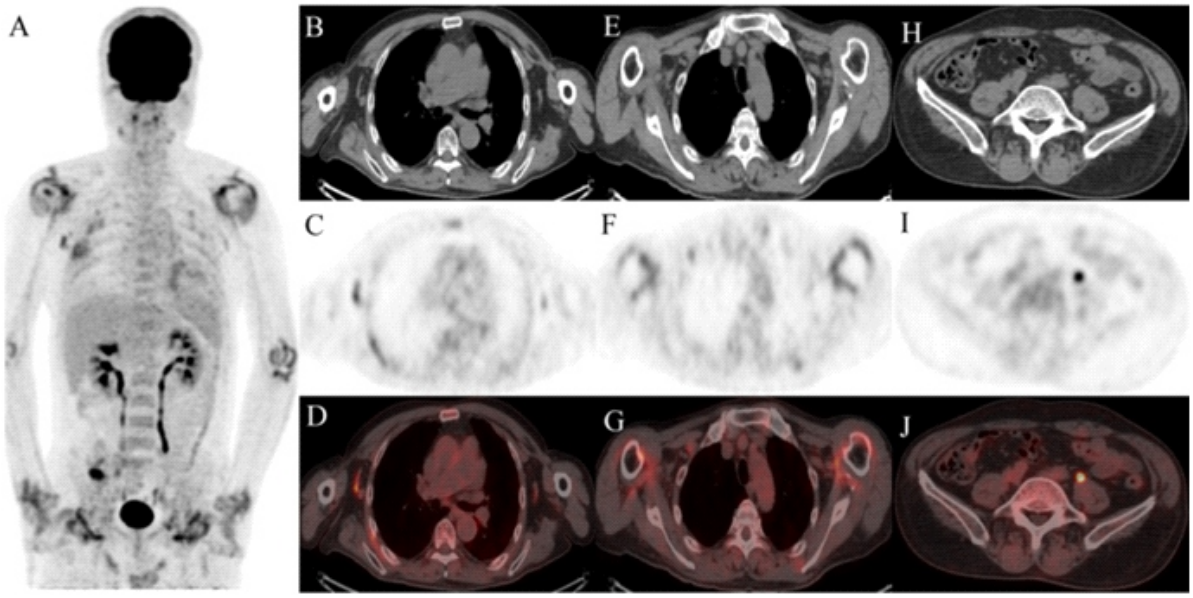

Figure 3. After a year of regular antitubercular treatment, follow-up ^{18}F-FDG PET/CT scans revealed symmetrical metabolic activity in all major joints (A). However, slight meabolic increases were observed in the subscapularis muscle and right axillary lymph node (B-D), indicating potential ongoing inflammation in these areas despite treatment. Encouragingly, no abnormal metabolic increases were detected in the bilateral back muscles (E-G), suggesting resolution of inflammation in these regions. Additionally, small retroperitoneal lymph nodes did not exhibit abnormal metabolic activity (H-J), further supporting the efficacy of the antitubercular therapy. Ongoing monitoring is advisable to ensure complete recovery from the infection.

The authors declare that they have no conflicts of interest.

Bibliography

1. Chapuis E, Benali K, Silbermann-Hoffman O et al. Musculoskeletal Tuberculosis: New Insights on Diagnosis Strategy and Treatment. *J Clin Rheumatol* 2022; 28(4): 201-5.
2. Zeng Y, Liu Y, Xie Y et al. Muscular Tuberculosis: A New Case and a Review of the Literature. *Front Neurol* 2019; 10: 1031.
3. Zhang D, Qiao K, Zhou Z et al. Diagnostic difficulties in muscular tuberculosis coexistent with nasopharyngeal carcinoma. *Jpn J ClinOncol* 2022; 52(9): 1067-8.
4. Zhu XW, Luan XH, Jiang KL et al. Case report: Muscular tuberculosis with lower-extremity muscular masses as the initial presentation: Clinicopathological analysis of two cases and review of the literature. *Front Med (Lausanne)* 2023; 10: 1106412.
5. Ye M, Huang J, Wang J et al. Multifocal musculoskeletal tuberculosis mimicking multiple bone metastases: a case report. *BMC Infect Dis* 2016; 16: 34.
6. Sardana R, Sardana NK, Sharma A. Tuberculosis of the axial skeleton mimicking malignancy. *J R Coll Physicians Edinb* 2020; 50(2): 168-70.

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