Rheumatoid Arthritis with Generalized Lymphadenopathy Mimicking Lymphoma on Positron Emission Tomography/Computed Tomography with $^{18}$F-Fluorodeoxyglucose

Abstract
A 42-year-old male presented with weight loss and progressively increasing pain and swelling in joints over the past 3 months. Contrast-enhanced computed tomography (CT) demonstrated pleuropulmonary opacities and supra/infradiaphragmatic lymph nodes enlargement. Positron emission tomography (PET/CT) with $^{18}$F-fluorodeoxyglucose showed intensely increased tracer uptake in joints, in pulmonary opacities, as well as in thoracic, iliac, and inguinal nodes. On suspicion of lymphoma with synovial involvement, he was submitted to lymph node and synovial biopsy, which revealed reactive follicular lymphadenopathy and synovium inflammatory changes, respectively. Rheumatoid factor resulted increased, and thus, diagnosis of rheumatoid arthritis with related lung and lymph node involvement was made.

Keywords: $^{18}$F-fluorodeoxyglucose, inflammation, lymphoma, positron emission tomography/computed tomography, rheumatoid arthritis

Aside its well-established role in oncology, nuclear medicine is routinely applied for imaging of infection and inflammatory diseases. Inflammatory cells, such as macrophages and lymphocytes, show high $^{18}$F-fluorodeoxyglucose ($^{18}$F-FDG) uptake, and therefore, positron emission tomography/computed tomography (PET/CT) has been utilized for the diagnosis and follow-up of several phlogistic conditions, including vasculitis and sarcoidosis. Concerning rheumatoid arthritis, $^{18}$F-FDG PET/CT proved useful to determine disease severity and to monitor response to treatment.

Here, we report the case of a 42-year-old male who presented to our hospital with pain and swelling in both large and small joints, associated with weight loss over the past 3 months, and enlarged axillary and inguinal lymph nodes. He was submitted to contrast-enhanced CT that showed bilateral pulmonary opacities and enlarged lymph nodes, some of whom with rounded morphology, located in the supraclavicular, thoracic, and axillary regions, as well as along iliac and inguinal axis. PET/CT with $^{18}$F-FDG showed increased tracer uptake in large and small joints, in some pericentimetric bilateral pleuropulmonary opacities, and in enlarged supra/infradiaphragmatic lymph nodes [Figure 1]. On suspicion of lymphoma with synovial involvement, the patient was submitted both to lymph node and synovial biopsy. Histology of one thoracic node revealed reactive follicular lymphadenopathy, thus excluding lymphoma, and biopsy of the knee synovium demonstrated inflammatory changes, mostly consisting of epithelial erosion, fibrin, and neutrophil depositions [Figure 2]. Considering the histological results, circulating level of rheumatoid factor (r.f.) was analyzed and returned increased values (372 IU/L, r.f. <30 IU/L). Therefore, diagnosis of rheumatoid arthritis with related lung involvement and lymphadenopathy was made. Treatment with prednisolone 25 mg b.i.d. was started with subsequent patient’s clinical benefit.

Enlarged lymph nodes are not rare in rheumatoid arthritis. In a cohort of 100 hospitalized patients, the overall frequency of enlarged and palpable lymph nodes resulted in 82% of subjects, being the axillary region the most common location. Of note, lymphadenopathy was found

Address for correspondence:
Dr. Luca Filippi,
Department of Nuclear Medicine, “Santa Maria Goretti” Hospital, 1Department of Medico-Surgical Sciences and Biotechnologies, Pathology Unit, ICOT Hospital, “Sapienza” University of Rome, 1Department of Medico-Surgical Sciences and Biotechnologies, Internal Medicine Unit, ICOT Hospital, “Sapienza” University of Rome, Latina, Italy

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associated with the grade of disease activity, being less evident in subjects under steroid therapy. Furthermore, it has been reported that patients with rheumatoid arthritis present an increased risk, compared to general population, of developing both Hodgkin’s lymphoma (HL) and non-HL (NHL). The link between rheumatoid arthritis and lymphoma has not been fully understood yet; likely, a combination of factors, such as genetic predisposition and continuous immune stimulation, is involved in the pathogenesis. On the other hand, it must be highlighted that, although rare, synovial involvement has been described in patients affected by NHL. Whole-body $^{18}$F-FDG PET/CT is routinely applied for the evaluation of HL and NHL, both for staging and evaluation of response to treatment. In our patient, the highly increased tracer incorporation in multiple lymph nodes, associated also with altered rounded morphology, raised the suspicion of $^{18}$F-FDG-avid lymphoma with diffuse synovial involvement that was, however, subsequently excluded by pathology.

The case reported here underscores that generalized lymphadenopathy in patients affected by RA may mimic lymphoma on PET/CT with $^{18}$F-FDG.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

References

1. Gotthardt M, Bleeker-Rovers CP, Boerman OC, Oyen WJ. Imaging of inflammation by PET, conventional scintigraphy, and other imaging techniques. J Nucl Med 2010;51:1937-49.
2. Filippi L, Biancone L, Petruzziello C, Schillaci O. Tc-99m HMPAO-labeled leukocyte scintigraphy with hybrid SPECT/CT detects perianal fistulas in Crohn disease. Clin Nucl Med 2006;31:541-2.
3. Kubota K, Yamashita H, Mimori A. Clinical value of FDG-PET/CT for the evaluation of rheumatic diseases: Rheumatoid arthritis, polymyalgia rheumatica, and relapsing polychondritis. Semin Nucl Med 2017;47:408-24.
4. Hotta M, Minamimoto R, Kaneko H, Yamashita H. Fluorodeoxyglucose PET/CT of arthritis in rheumatic diseases: A pictorial review. Radiographics 2020;40:223-40.
5. Calgüneri M, Oztürk MA, Ozbalkan Z, Akdogan A, Ureten K, Kiraz S, et al. Frequency of lymphadenopathy in rheumatoid arthritis and systemic lupus erythematosus. J Int Med Res 2003;31:345-9.
6. Klein A, Polliack A, Gafner-Gvili A. Rheumatoid arthritis and lymphoma: Incidence, pathogenesis, biology, and outcome. Hematol Oncol 2018;36:733-9.
7. Kim B, Raphael B, Liu C, Golden BD. Non-Hodgkin lymphoma with synovial involvement of the knee. Bull Hosp Jt Dis (2013) 2019;77:275-8.