



## Case report

# Transient <sup>18</sup>FDG-avid hilar lymph node on PET/CT imaging in asymptomatic COVID-19

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## ARTICLE INFO

## Article history:

Received 18 September 2020

Received in revised form 30 September 2020

Accepted 30 September 2020

## Keywords:

Coronavirus disease-2019

COVID-19

Positron emission tomography

Lymphadenopathy

Case report

Lymph node

## ABSTRACT

The most common features of coronavirus disease-2019 (COVID-19) pneumonia on chest computed tomography imaging are ground glass opacity and consolidation. Mediastinal and hilar lymph node enlargement are less frequently observed. Herein, we present an unexpected finding of fluorodeoxyglucose (FDG)-avid hilar lymph node in an asymptomatic patient with COVID-19, and show that this is a transient phenomenon, subsiding on a follow-up FDG-PET/CT within 10 days.

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## Introduction

Patients infected with severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) mainly present with fever, cough, dyspnea, and fatigue. The characteristic features of coronavirus disease-2019 (COVID-19) in the lower respiratory tract on chest computed tomography (CT) are ground-glass opacities and consolidation, predominantly in a peripheral distribution [1,2]. Mediastinal and hilar lymph node enlargement on CT are rare and were initially thought to be against a diagnosis of COVID-19 [1]. Nonetheless, subsequent studies reported lymphadenopathies in patients with severe COVID-19 [3]. Herein, we report a young woman with COVID-19 who had hilar lymphadenopathy on fluorine-18-fluorodeoxyglucose positron emission tomography (<sup>18</sup>FDG-PET)/CT imaging.

## Case report

An otherwise healthy 27-year-old woman presenting with isolated anosmia of 6-weeks duration was admitted to our hospital during the recent pandemic. She had no history of alcohol consumption or tobacco smoking, and did not take any

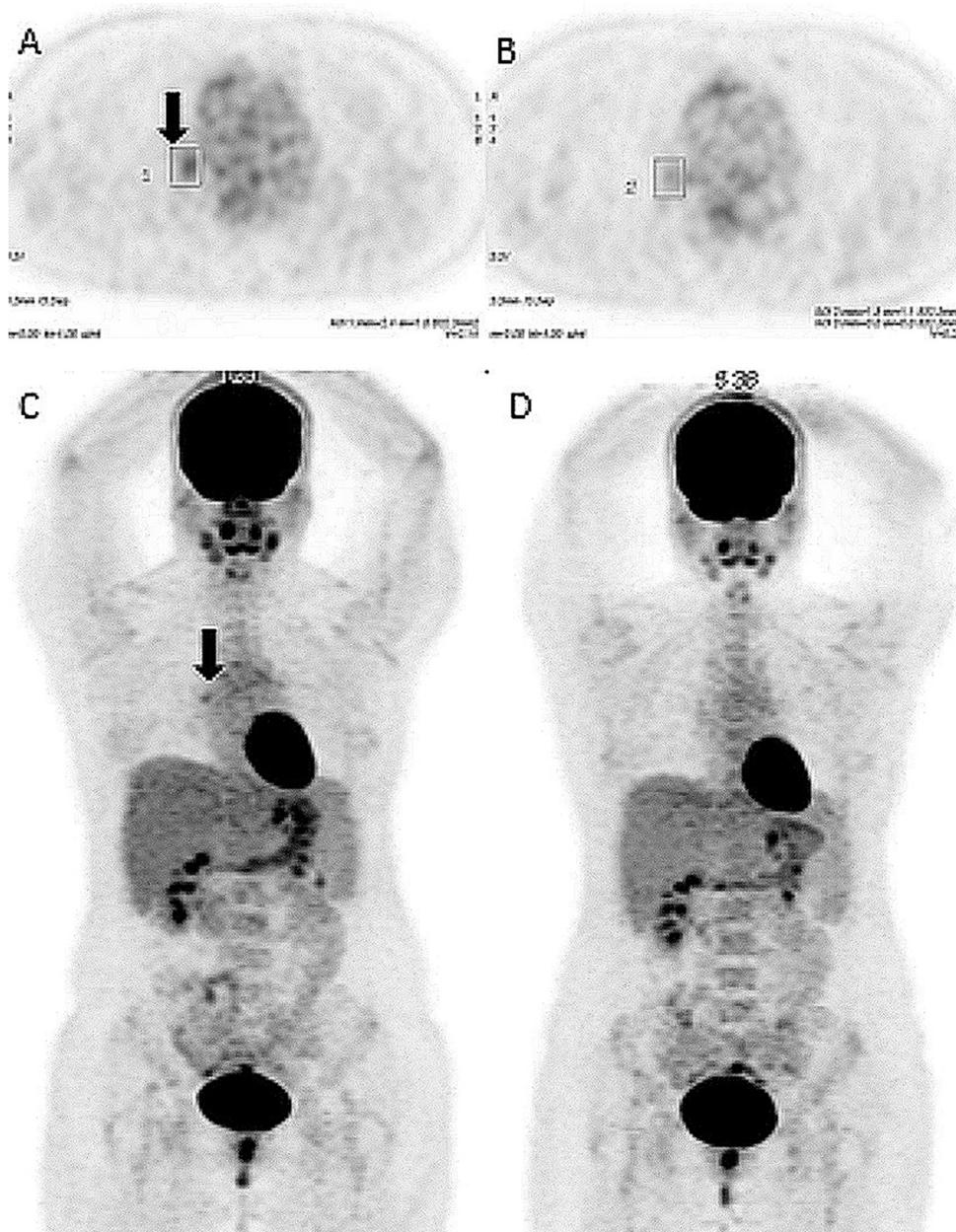
medications. A diagnosis of COVID-19 was later confirmed in this patient by a positive real-time reverse-transcription polymerase chain reaction (RT-PCR) assay. The patient underwent whole body PET/CT for investigation of anosmia as part of a study approved by our Institutional Review Board to investigate the putative neurological mechanisms of anosmia in COVID-19. The PET study was primarily designed to assess for abnormal metabolic activity of specific regions within the cerebral cortex as a consequence of direct neurotropic effect of SARS-CoV-2 [4,5], which is supported by the absence of sinonasal symptoms and also findings of normal magnetic resonance imaging of the olfactory cleft in some patients with anosmia related to COVID-19 [6]. The <sup>18</sup>FDG-avid right hilar lymph node revealed on PET/CT was an unexpected incidental finding since the patient had no fever, respiratory symptoms or pulmonary infiltration on imaging (Fig. 1). Additionally, there were no clinical findings in the patient's past medical history or on physical examination and other investigations (e.g., on imaging) in favor of an underlying occult malignancy. We performed a repeat PET/CT scan ten days later, which revealed no <sup>18</sup>FDG-avid or reactive non-<sup>18</sup>FDG-avid mediastinal or hilar lymph nodes, confirming a transient uptake in the lymph node.

## Discussion

Recently, studies of <sup>18</sup>FDG-PET/CT showed <sup>18</sup>FDG-avid ground-glass opacities, consolidative opacities and lymph nodes in

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**Fig. 1.**  $^{18}\text{F}$ -FDG-PET/CT scan of a 27-year-old woman with no respiratory symptoms. (A, C) An incidentally detected  $^{18}\text{F}$ -FDG-avid lymph node in the right hilum (arrow) with a standardized uptake value of 2.6 (B, D) A repeat  $^{18}\text{F}$ -FDG-PET/CT scan in 10 days shows resolution of the  $^{18}\text{F}$ -FDG uptake.

patients with clinical suspicion of COVID-19. However, the patients reported in a study by Qin et al. had respiratory symptoms and fever on admission and COVID-19 was not confirmed by RT-PCR assay [7]. Additionally,  $^{18}\text{F}$ -FDG-avid mediastinal nodes were observed in an asymptomatic patient with a history of ovarian cancer in the presence of interstitial pulmonary infiltration; the patient had no sign of tumor recurrence and SARS-CoV-2 was subsequently detected by RT-PCR [8]. Nevertheless, considering the history of a previous malignancy in this patient, the significance of the  $^{18}\text{F}$ -FDG uptake and its relation to COVID-19 is uncertain.

The transient high metabolic activity of hilar lymph nodes in the absence of pulmonary symptoms, pulmonary infiltrates or lymph node enlargement likely indicates subclinical viral replication in the lymph nodes, which in the more severe cases of COVID-19 can result in detectable lymphadenopathy. This finding may have

implications in interpreting hybrid imaging such as PET/CT scans that are performed for staging of malignancies or for the assessment of inflammatory disorders. Patients with  $^{18}\text{F}$ -FDG-avid mediastinal and hilar lymphadenopathy generally undergo mediastinoscopy or endobronchial ultrasound-guided transbronchial needle aspiration for further pathological investigation. However, during the current pandemic, with the possibility of COVID-19 infection even in asymptomatic patients,  $^{18}\text{F}$ -FDG-avid lymph nodes may be a sign of subclinical COVID-19. Thus, in the context of the clinical scenario, this differential diagnosis should be considered when  $^{18}\text{F}$ -FDG-avid lymph nodes are encountered on PET/CT scans and so, PCR testing for SARS-CoV-2 and short-term follow-up may be prudent during the ongoing pandemic.

In conclusion, we demonstrated transient  $^{18}\text{F}$ -FDG-avid hilar lymph node on PET/CT in the absence of pulmonary or systematic symptoms of COVID-19, warranting attention by clinicians

interpreting such findings during the COVID-19 pandemic. Whether the absence of mediastinal or hilar lymphadenopathy, especially in the mild or moderate forms of COVID-19, indicates a lack of inflammatory reaction to pulmonary involvement is not known. Further studies are needed to elucidate the pathobiology of SARS-CoV-2 infection in lymphocytes and to investigate the effects of COVID-19 on lymphatic tissue during the course of COVID-19 infection.

### Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

### Consent to participate

Informed consent to participate in the study was obtained from the participant.

### Consent for publication

The participant has consented to the submission of the case report to the journal.

### Author contribution

All authors contributed to the study conception and design. Mehrdad Bakhshayeshkaram and Abbas Yousefi-Koma provided the case and images, and Neda Khalili, Mahboobeh Karimi-Galougahi and Sara Haseli drafted and/or critically revised the manuscript. All authors read and approved the final manuscript.

### Declaration of Competing Interest

The authors report no declarations of interest.

### Acknowledgement

None.

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