

Case Reports

Thyroiditis- A Challenging Case Report that Used PET-CT for Definitive Diagnosis in a Non-COVID Patient During COVID-19 Pandemic

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Abstract:

A whole-body PET scan coupled with contrast-enhanced CT was performed on a 45-year-old woman with persistent fever for 3 weeks. This was performed to make a definitive diagnosis in a few hours as an out-patient itself to avoid admission / frequent visits to the hospital during the COVID-19 pandemic for this non-COVID patient. Although step-wise investigations such as ultrasound, thyroid antibodies, and biopsy would be ideal and devoid of radiation, other co-existing causes for fever if any (malignancy, other non-infectious causes) might have been missed. Therefore, in addition to confirming the clinical diagnosis (Thyroiditis), whole-body PET-CT helped to rule out other causes of fever of 3-week duration. Therefore, we wish to highlight the unique approach that we adopted here due to the restrictions on admissions during the pandemic for this non-COVID patient.

Keywords: Subacute Painful Thyroiditis; COVID-19 pandemic; Positron Emission Tomography Computed Tomography.

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Introduction

Thyroiditis, an inflammatory disease of thyroid glands, constitutes about 20% of thyroid diseases.¹ It causes initial hyperthyroidism due to destruction of thyroid glands followed by hypothyroidism and ultimately resulting in euthyroid status within about one year.¹ Subacute thyroiditis (SAT) usually occurs along with or following a viral infection with more preponderance in women. The classical clinical features are pain in the neck, tender thyroid glands, systemic signs/symptoms.^{2,3} Recently, COVID-19 infection has also

been found to associate with thyroiditis and a few cases have been reported and ultrasound has confirmed the diagnosis.^{2,3} Here, we report a case of thyroiditis in a non-COVID patient for whom the diagnostic confirmation was done by whole-body positron-emission tomography coupled with computed tomography (PET-CT).

Case Description

A 45-year-old woman presented to the emergency department with a history of fever for 5 days. She was discharged after 2 hours following the collection of samples, CT thorax (CORADS 1). All blood and urine investigations including cultures were normal except WBC 14330, elevated ESR(52 mm). Fever was relentless in the same pattern for another week despite Tab. Azithromycin 500 mg bid started empirically (suspecting enteric fever) and the patient noticed swelling and pain over the neck during fever episodes. Tablet Ibuprofen (400 mg) plus paracetamol (325 mg) started with a clinical diagnosis of "Thyroiditis" and Azithromycin discontinued. Thyroid profile showed T4 15.3 ug/dL, TSH

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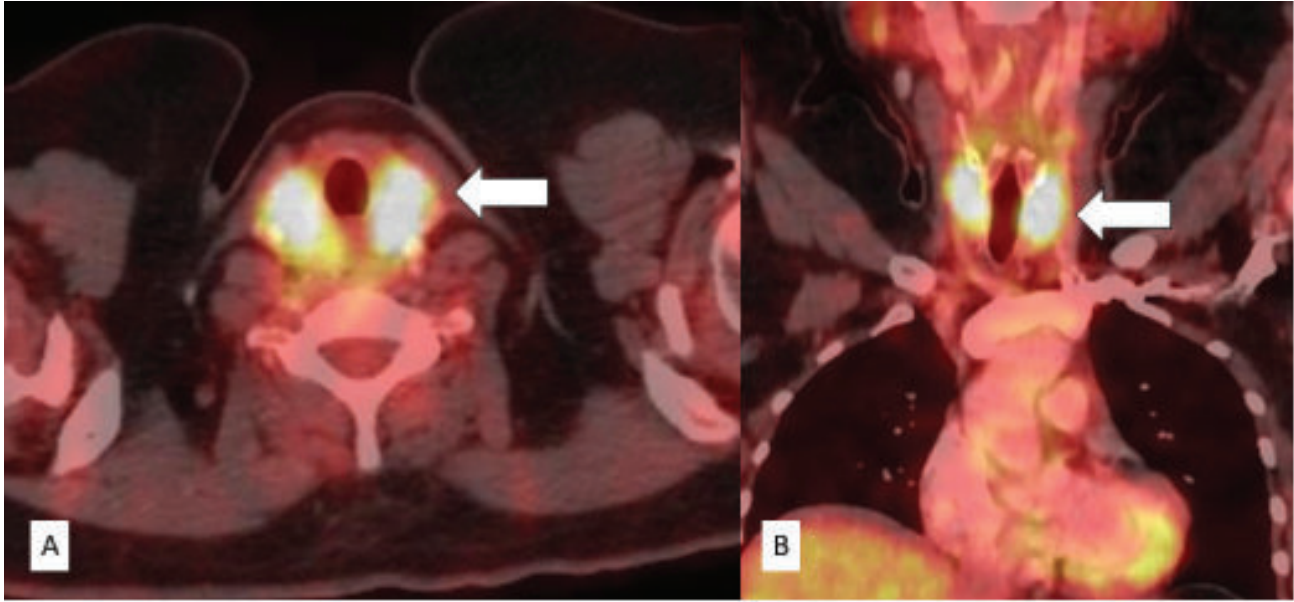


Fig-1: PET-CT Images axial (A) and coronal sections (B) showing intense FDG uptake consistent with thyroiditis

0.12 mIU/mL. The fever was persisting for another week. Whole-body contrast-enhanced FDG-PET-CT was performed to make a definitive diagnosis (Fig-1). Tab.Prednisolone 30mg was started and tapered gradually and stopped after 5 weeks. Thyroid profiles were normal at 2,5 months follow-up.

Discussion

The clinical features described here are typical that of thyroiditis such as a female patient, fever with neck pain, tender thyroid glands, elevated ESR, higher T4, and lower TSH² besides the PET-CT findings of diffuse uptake of FDG confirming it.¹ SAT commonly occurs along with or following a viral infection. Many viruses have been found to cause SAT in the past and recently, COVID-19 infection has also been implicated.^{2,3} A vast majority of the patients were middle-aged women.^{2,3} A recently published review article evaluating 22 patients of SAT following COVID-19 infection, found that 81.8% of them were women with the average age being 39.³ Furthermore, it was also observed that clinical manifestations of SAT emerged approximately 21±11 days following COVID-19 infection.³ However, in our case, the clinical manifestations of SAT started one week after the onset of fever and it was not in association with COVID-19 infection. The thyroid profile also typically suggestive of SAT in our case as reported previously.^{1,3}

The challenges faced by the clinicians as well as the patients during the COVID-19 pandemic were elaborated for

diagnosing thyroiditis in a COVID-positive patient.⁴ We believe that it is similar or even more for a non-COVID patient (i.e. avoiding contracting infection) as described here. Another recently published systematic review has mentioned that 21 cases of thyroiditis were reported as of February 3, 2021, in COVID19 patients, and all were diagnosed with ultrasound.² Ultrasound typically shows an enlarged thyroid, diffuse hypoechoic areas, and absent/ low vascularization at color doppler.⁵ The escalation to PET-CT was adopted here to make a definitive diagnosis within a few hours as an out-patient itself thereby avoiding admission/ frequent visits to hospital during the pandemic for this non-COVID patient. Although step-wise investigations such as ultrasound, thyroid antibodies, biopsy would be ideal, economical, and devoid of radiation, other co-existing causes for fever if any (malignancy, other non-infectious causes) might have been missed. Therefore, in addition to confirming the clinical diagnosis, whole-body PET-CT helped to rule out other causes of fever of 3-week duration. However, cost effectiveness of this investigation in non-pandemic settings needs to be carefully considered besides its radiation hazards.

To conclude, “Thyroiditis” is one of the common conditions causing fever with neck swelling and pain over the thyroid glands and should be considered as one of the differential diagnosis and investigated accordingly. PET-CT might be helpful in a situation like described here and can also considered as one of the investigating tools.

References:

1. Albano D, Treglia G, Giovanella L, Giubbini R, Bertagna F. Detection of thyroiditis on PET/CT imaging: a systematic review. *Hormones (Athens)*. 2020 Sep;19(3):341-349. doi: 10.1007/s42000-020-00178-x. Epub 2020 Feb 10. PMID: 32037486.
2. Aemaz Ur Rehman M, Farooq H, Ali MM, Ebaad Ur Rehman M, Dar QA, Hussain A. The Association of Subacute Thyroiditis with COVID-19: a Systematic Review. *SN Compr Clin Med*. 2021 Apr 29:1-13. doi: 10.1007/s42399-021-00912-5. Epub ahead of print. PMID: 33942028; PMCID: PMC8082479.
3. Caron P. Thyroiditis and SARS-CoV-2 pandemic: a review. *Endocrine*. 2021;72:326-331
4. Dworakowska D, Morley S, Mulholland N, Grossman AB. COVID-19-related thyroiditis: A novel disease entity?. *Clin Endocrinol (Oxf)*. 2021;95(3):369-377. doi:10.1111/cen.14453
5. Brancatella A, Ricci D, Cappellani D, et al. Is Subacute Thyroiditis an Underestimated Manifestation of SARS-CoV-2 Infection? Insights From a Case Series. *J Clin Endocrinol Metab*. 2020;105(10):dgaa537. doi:10.1210/clinem/dgaa537