

# Subacute Thyroiditis After Severe Acute Respiratory Syndrome Coronavirus 2 Vaxzevria Vaccination in a Patient With Thyroid Autoimmunity

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## Abstract

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic has been challenging the scientific community to promptly treat the patients and mitigate its spreading. The rapid development of vaccination against SARS-CoV-2 is being highly effective, but it is still lacking knowledge about its side effects. Epidemiological studies point toward virus infection as causative agents of subacute thyroiditis. More than 20 cases of thyroiditis after SARS-CoV-2 have also been described. Here, we aim to broaden the spectrum of SARS-CoV-2 vaccination thyroid-associated disorders with the description of a new case of subacute thyroiditis associated with thyroid autoimmunity. The temporal association with the inoculation of the vaccine and the absence of other plausible etiological agents makes it highly possible that this thyroiditis was caused by Vaxzevria vaccine. It remains to be established whether the presence of thyroid autoimmunity can facilitate this condition, as this is one of the few described cases associated with autoimmunity.

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**Categories:** Endocrinology/Diabetes/Metabolism, Allergy/Immunology, Infectious Disease

**Keywords:** vaxzevria, auto-immunity, sars-cov-2 vaccine, covid, subacute thyroiditis

## Introduction

Subacute thyroiditis is a clinical entity characterized by fever and thyroid pain, which often radiates to ears, jaw, and throat. As such, it is easily confounded with pharyngitis. Patients may also have unspecific symptoms like fatigue and malaise. It is an uncommon cause of thyrotoxicosis that is believed to be mainly caused by viral infections [1]. Epidemiological studies point toward virus infection as causative agents of subacute thyroiditis. There are also cases described after influenza and hepatitis B vaccination [2,3]. However, given the optimal response to anti-inflammatory drugs and self-limited course of the disease, the etiological diagnosis is not always pursued in the clinical setting.

About one year ago, one of the first cases of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) associated thyroiditis was published [4]. A few months ago, a case of thyroiditis after a SARS-CoV-2 mRNA vaccine was reported [5].

SARS-CoV-2 pandemic has been challenging the scientific community to promptly treat the patients and mitigate its spreading. The rapid development of vaccination against SARS-CoV-2 is being highly effective, but it is still lacking knowledge on its side effects. It has already been shown that the infection with the virus may associate to subacute thyroiditis [6] and, more recently, more than 20 cases of thyroiditis after SARS-CoV-2 vaccine have also been described [7,8]. We would like to broaden the spectrum of SARS-CoV-2 thyroid-associated disorders by the description of a new case of subacute thyroiditis associated with thyroid autoimmunity.

## Case Presentation

Here, we describe the case of a 32-year-old woman, music teacher, with no relevant personal past or family history who received Vaxzevria vaccine (AstraZeneca, Nijmegen, Netherlands) against SARS-CoV-2 (first dose) on March 25, 2021. On April 19, she came to the emergency room complaining of painful swallowing and neck pain since March 29 and fever since April 18. She had no other complaints. She brought a cervical CT performed at a private institution about one week earlier, showing “slightly enlarged thyroid gland”; at this point, she was thought to have an upper respiratory tract infection and was treated with azithromycin and ceftriaxone; however, there was no symptomatic improvement. On examination, she was febrile (38.4°C) and hemodynamically stable (blood pressure: 133/76 mmHg; pulse rate: 87 beats per minute; respiration rate: 12 breaths per minute) and showed a marked neck tenderness when submitted to anterior neck palpation. Blood analysis (Table 1) showed leukocytosis and neutrophilia, high C-reactive protein, high free T4 and T3, and suppressed thyroid-stimulating hormone (TSH). Also, she had positive thyroid peroxidase antibodies. Thyroid ultrasound (Figure 1) showed “enlarged thyroid gland with heterogeneous and hyper-

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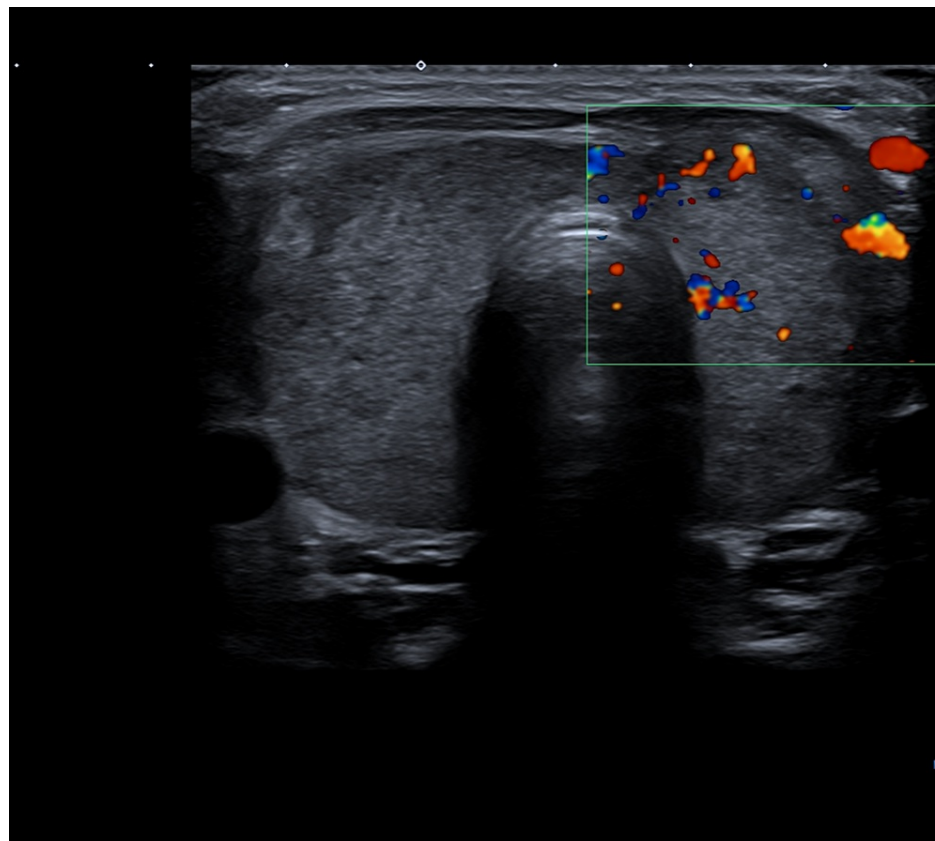
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vascularized parenchyma, suggesting thyroiditis". It was made the presumptive diagnosis of subacute thyroiditis in possible causal association with the inoculation of Vaxzevria vaccine against SARS-CoV-2. The patient began prednisolone 40 mg daily, by way of the mouth (per os), at 9 am, with great clinical and biochemical improvement: after few days from starting the treatment, she was asymptomatic; on biochemical follow-up made in July, thyroid function had normalized. In August 2021, she had weaned of prednisolone with good tolerance, and thyroid function remained normal.

Parameter	Result	Normal value
Leucocytes	16.80x10 <sup>9</sup>	4.0 to 11.0x10 <sup>9</sup> /L
Neutrophils	74.5	53.8% to 69.8%
C-reactive protein	262	<3.0 mg/dL
Free T4	3.02	0.70 to 1.48 ng/dL
Free T3	5.97	2.30 to 4.20 ng/dL
TSH	0.009	0.35 to 4.94 UI/mL
Thyroid peroxidase antibody	45.1	<16.0 UI/mL

**TABLE 1: Blood analysis on April 19.**

TSH: thyroid-stimulating hormone.



**FIGURE 1: Thyroid ultrasonography.**

Thyroid ultrasonography showing an enlarged gland with heterogeneous parenchyma with associated hypervascularity, suggesting thyroiditis.

## Discussion

Subacute thyroiditis is a benign thyroid disorder with a self-limited course. Although its pathophysiology is largely unknown, it is believed to be associated to viral infections [9,10]. Here, we present a case of a subacute thyroiditis with positive thyroid autoimmunity in possible association with Vaxzevria vaccine. This case highlights the role of cautious anamnesis and physical examination, as subacute thyroiditis symptoms might be confounded with several other disorders, namely SARS-CoV-2 infection [11]. This case report might be lacking the anti-TSH antibodies and erythrocyte sedimentation rate result; however, those are not measured at our emergency setting, and considering the straightforward subacute thyroiditis diagnosis and great response to the therapy, those were not measured within the follow-up period and considered dispensable.

Considering the existing data on thyroiditis associated to vaccines against other viruses and recent reports on thyroiditis after SARS-CoV-2 vaccine [12], it is biologically plausible that this Vaxzevria also associates to thyroiditis. Different authors reported the onset of subacute thyroiditis after both the first and second vaccine doses, with different lag periods and symptoms [7,13,14]. Besides, it is not possible to confirm the causality of this association either clinically or histologically; the temporal association with the inoculation of the vaccine and the absence of other probable etiological agents makes it reinforces this possibility.

The prominence of this case is emphasized by the positive thyroid autoimmunity. Regarding the paucity of the existing data, we still need to understand if this finding can facilitate the development of thyroiditis after Vaxzevria vaccine. It is needed for every subsequent study on this topic to register and present autoimmunity data in order to clarify this question.

## Conclusions

In conclusion, this case report highlights that the diagnosis of subacute thyroiditis must be contemplated when a patient presents with anterior cervical pain and fever after SARS-CoV-2 vaccination. This report aims to contribute to the availability of observational data to strengthen the hypothesis of a causal relation between SARS-CoV-2 vaccine and subacute thyroiditis. It remains to be established whether the presence of thyroid autoimmunity can facilitate this condition, as this is one of the few described cases associated with autoimmunity.

## Additional Information

### Disclosures

**Human subjects:** Consent was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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