



CASE REPORT

A Case of New-Onset Lichen Planus after COVID-19 Vaccination

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ABSTRACT

The COVID 19 vaccination campaign has been underway for about a year now, and there are now many skin reactions associated with the administration of these vaccines in the literature. In view of the forthcoming third dose, we believe it is important to report our experience.

Keywords: Lichen planus; COVID-19; SARS-CoV-2; Vaccine

Key Summary Points

Lichen planus is an inflammatory dermatosis involving the skin and/or mucous membranes, of unknown etiology mediated by T lymphocytes.

It can be associated with numerous triggers, such as medications, infections (such as Hepatitis C), and vaccines.

There are currently few cases in the literature reporting a relationship between COVID 19 vaccination and the occurrence of lichen planus.

This is one of the first cases of lichen planus associated with the Moderna vaccine.

INTRODUCTION

In December 2020, the US Food and Drug Administration (FDA) approved the worldwide use of messenger RNA (mRNA)-based vaccines, Pfizer/BioNTech (BNT162b2) and Moderna (mRNA-1273), to address the COVID-19 pandemic.

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However, as the vaccination campaign continues and more and more people are being administered the vaccine, several vaccination-associated skin manifestations poorly reported in the literature are encountered in clinical practice.

CASE REPORT

Here we report the case of an 81-year-old male patient who, 7 days after the Moderna vaccine, developed an itchy papular rash with typical aspects of lichen planus. The patient presented

to our dermatology outpatient unit with a 1-week history of intense pruritic eruption. During history collection, the patient reported no notable comorbidities and no prior episodes of lichen planus (LP). Moreover, the patient was not routinely taking any medications and denied taking any drugs prior to the rash. He also denied correlation with any stressful event prior to the onset of manifestations. On dermatologic physical examination, diffuse purple and polygonal papules were found on the flexor region of the wrists, lumbosacral region, posterior surface of the thighs, and dorsal region of the feet (Fig. 1). On dermoscopy, Wickham's



Fig. 1 **A** Polygonal purpuric papules placed on dorsal region of the feet. **B** Polygonal purpuric papules placed on flexor region of the wrists. **C** Polygonal purpuric papules placed on lumbosacral region



Fig. 2 Oral lichen planus: papular and whitish lesions of the oral mucosa

striae were clearly appreciated. These lesions appeared together at 7 days after the administration of the first dose of Moderna vaccine and immediately presented with an associated intense itchy symptomatology, only partially responsive to antihistamine therapy. Furthermore, on physical examination of the oral mucosa, whitish papular lesions were found, with symmetrical and bilateral distribution (Fig. 2), typical of an oral papular LP [1]. Oral lesions, in contrast to cutaneous lesions, were asymptomatic. Hematochemical examinations allowed us to rule out underlying hepatic involvement and any other infectious diseases. Finally, a skin biopsy was performed to confirm our clinical suspicion of LP. Histologic analysis showed the presence of hyperkeratosis with acanthosis, colliquative degeneration of basal layer cells, and banded lymphocytic infiltrate in the superficial dermis. A diagnosis of a new-onset LP was made, and treatment with high-potency topical corticosteroids (clobetasol propionate) and H(1)-antihistaminic therapy (cetirizine 10 mg/daily) for 10 days was started. At the follow-up visit, 15 days after the start of therapy, the patient presented in clinical remission with absence of oral and cutaneous manifestations. Finally, 1 month after the last

visit, the patient did not present disease recurrence. The patient gave the consent for photo acquisition and publication. Our manuscript meets the ethical standards according to the Declaration of Helsinki.

DISCUSSION

LP is an inflammatory dermatosis involving the skin and/or mucous membranes, of unknown etiology mediated by T lymphocytes. It can be associated with numerous triggers, such as medications, infections (such as Hepatitis C), and vaccines [2]. Moreover, among the latter, the vaccines most frequently associated in the literature with LP are those for influenza and herpes zoster [3]. There are currently few cases in the literature reporting a relationship between COVID-19 vaccination and the occurrence of lichen planus, and most were associated with the Pfizer vaccine or following the administration of vector-based COVID-19 vaccine (Ad26.COV2.S) [4–8]. This is one of the first cases associated with the Moderna vaccine. McMahon et al. [9] performed a registry-based study where they discussed the occurrence of vaccine-related eruption of papules and plaques (V-REPP) after COVID-19 vaccination. Among these skin manifestations, lichen planus was reported in four cases, three of which were related to the Pfizer vaccine and one to the Moderna vaccine. The physiopathological mechanisms underlying the relationship between LP and vaccination for COVID-19 are still poorly understood, however, it has been shown that after such vaccines there can be a stimulation of the immune response of T helper lymphocytes type 1 (Th1) [10], leading to the stimulation of the production of interleukin (IL)-12, tumor necrosis factor (TNF) α , and interferon (IFN) γ , cytokines involved in the pathogenesis of LP [11]. What emerges from the literature at present, is that COVID-19 vaccines can cause strong T-cell responses [9–11]. The mechanism by which they might elicit immunostimulatory effects, including triggering T-cell-dependent disorders, requires further study. In fact, there are still few data in the literature that support a causal association

between the pathophysiological mechanism just mentioned and the onset of LP.

CONCLUSION

Our case suggest that the COVID-19 vaccine might be a trigger for the development of LP [8]. Since LP is a disease of unknown etiology and data currently available on this subject are not sufficient, it is not possible to establish a causal relationship between the two events. In conclusion, given the global administration of these vaccines, in view also of the third dose, we consider this case important for the literature to deepen the topic. Certainly further studies are necessary.

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Compliance with Ethics Guidelines. The patient gave the consent for photo acquisition and publication. Our manuscript meets the ethical standards according to the Declaration of Helsinki.

Data Availability. Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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