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CASE REPORT

New-Onset Palmar Psoriasis Following mRNA COVID-19 Vaccination: A Case Report

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Abstract: Palmoplantar psoriasis is a rare, chronic, localized variant of psoriasis. It represents 3–4% of all psoriasis cases and is characterized by hyperkeratotic or desquamative erythematous plaques with fissures and erosions exhibiting acral distribution. Occasionally, superimposed sterile pustulations may also occur. New-onset psoriasis and various clinical subtypes of psoriasis exacerbation have been reported following the administration of messenger ribonucleic acid (mRNA)-based coronavirus disease 2019 (COVID-19) vaccines, with plaque-type psoriasis being the most common. However, palmar psoriasis has not yet been reported in association with COVID-19 vaccination. Herein, we present a case of new-onset palmar psoriasis along with nail changes following mRNA COVID-19 vaccination, which was further exacerbated following successive vaccine doses.

Keywords: psoriasis, palmoplantar, mRNA vaccine, COVID-19

Introduction

Palmoplantar psoriasis is an atypical variant of psoriasis that mainly affects the palmar and plantar skin and represents 3–4% of all psoriasis cases.[1] Its major clinical presentation consists of sharply demarcated hyperkeratotic or desquamative erythematous plaques, along with fissures and erosions, with an acral distribution. Superimposed sterile pustulation may also occur occasionally. These lesions are often painful and contribute to more significant physical discomfort and functional impairment compared to psoriasis affecting other body regions.[2] Following the emergence of the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), vaccination has been the main public health measure used to overcome the coronavirus disease 2019 (COVID-19) pandemic. However, similarly to certain other drugs and vaccines, new-onset and exacerbation of psoriasis have been reported following the administration of COVID-19 vaccines.[3–22] One systematic review showed that the exacerbation of pre-existing psoriasis is more common than *de novo* psoriasis following COVID-19 vaccination, as only 15.1% of reported cases were ones of new-onset psoriasis. Among the several clinical subtypes of psoriasis, plaque psoriasis was the most reported following COVID-19 vaccination (33.3%), followed by guttate (25.9%), pustular (14.8%), nail (11.1%), and annular psoriasis 3.7%.[23] To our knowledge, isolated palmar psoriasis accompanied by psoriatic fingernail changes has not yet been reported in the literature following COVID-19 vaccination. Herein, we present a case of new-onset palmar psoriasis accompanied by psoriatic nail changes following messenger ribonucleic acid (mRNA)-based COVID-19 vaccination, which was exacerbated by subsequent vaccine doses.

Case Presentation

A 51-year-old married woman, non-smoker, taking no regular medications other than intermittent paracetamol for headaches and with no notable prior medical history, presented to our dermatology outpatient clinic complaining of bilateral palmar skin eruption that had been ongoing for 3 years. The patient denied any family history of atopic dermatitis, psoriasis, or other autoimmune diseases. She was not receiving any medications, her weight was 68 kg, height 162 cm, and body mass index was 25.9 kg/m^2. She reported being in a normal state of health until 3 years prior, when she received her first dose of the Pfizer-BioNTech mRNA-based

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COVID-19 vaccine, after which she began developing painless, mildly pruritic, fluid-filled lesions that drained upon rupture, followed by desquamation. These lesions were discretely scattered over both palms and were well managed with topical corticosteroids.

The patient received a second dose of the same vaccine, and 3 days later, she noticed a significant exacerbation of the condition. The vesicular skin eruption disseminated until it involved both of her palms entirely, followed by severe skin desquamation. She also noticed related changes involving her fingernails. Following this, her condition had begun responding poorly to topical corticosteroids, without complete remission. No specific diagnosis had yet been made.

The condition then began to disrupt the patient's lifestyle, making daily life tasks more challenging. She noted that she had a prior history of mild atopic dermatitis during childhood, but no other personal or family history of psoriasis. No psoriatic skin lesions had occurred elsewhere apart from her palms. The patient had no history of joint pain, drug intake that could have triggered the condition, allergen or irritant exposure, or animal contact. The patient worked as a secretary in an office, occupying a desk-based workspace.

Dermatological examination revealed scaly erythematous plaques with bilateral desquamation and erosions involving the bilateral palmar skin extending to the dorsal aspects of the fingers. In addition to fingernail changes, which included irregular nail-pitting, distal onycholysis and salmon patches were also observed. No psoriatic skin changes were observed upon full skin examination (Figures 1 and 2).

Histopathological examination of a skin punch biopsy specimen revealed that the epidermis had areas of parakeratosis in the stratum corneum. The granular layer was intact, with regular acanthosis and moderate spongiosis. The dermis showed perivascular mixed lympho-histiocytic inflammatory infiltrates involving the upper, middle, and lower dermis, whereas the hypodermis was unremarkable. Grocott's methenamine silver and periodic acid-Schiff staining did not reveal any evidence of fungal elements. The clinical and histopathological findings suggested spongiotic psoriasiform dermatitis. Given the extensive palmar involvement, associated nail changes, functional impairment, inadequate response to topical therapy, and supportive histopathological findings, treatment with ixekizumab was initiated. Baseline investigations, including complete blood count, liver and renal function tests, tuberculosis screening, and hepatitis B and C serologies, were all within normal limits. A loading dose of 160 mg was administered subcutaneously at week 0, followed by 80 mg every two weeks for 12 weeks, and subsequently 80 mg every 4 weeks as maintenance. By week 5, the patient showed significant reduction in erythema, desquamation, and pruritus. Complete resolution and remission were achieved after 8 weeks of treatment (Figure 3). The

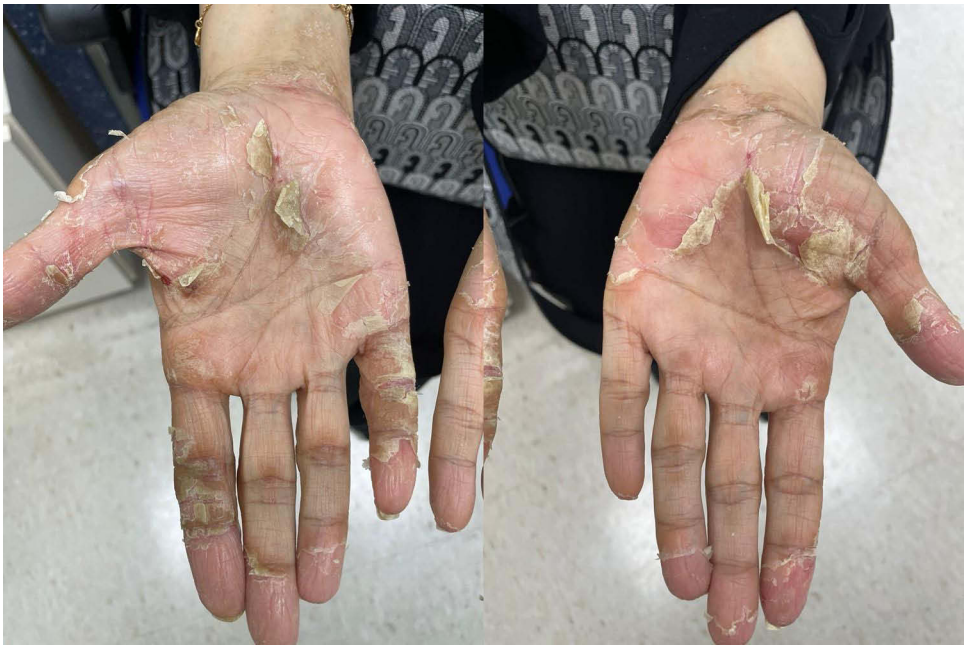

Figure 1 Well-defined scaly erythematous plaques with desquamation and erosions are observed on the bilateral palmar skin.

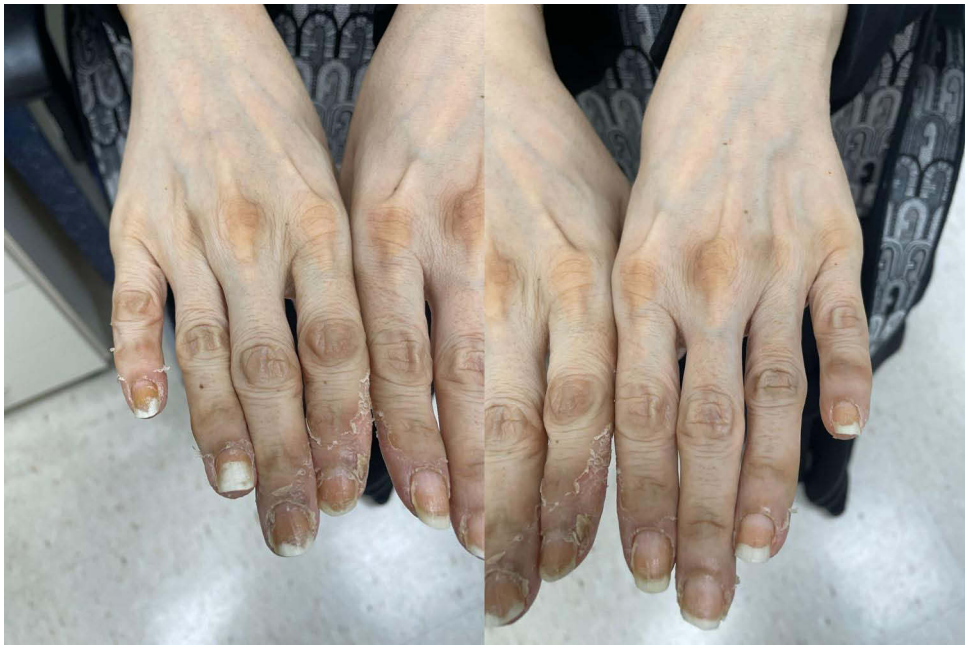

Figure 2 Desquamation extended to the dorsal aspect of the fingers, along with fingernail changes including irregular nail pitting, distal onycholysis, and salmon patches.

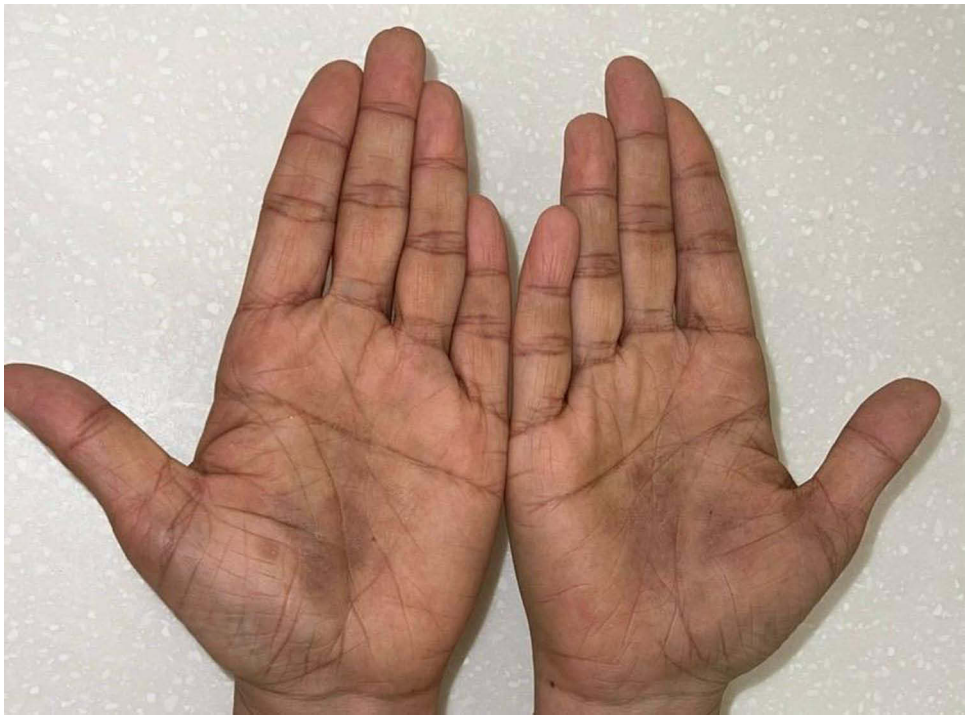

Figure 3 Marked clinical improvement with resolution of erythema and desquamation. Residual post-inflammatory hyperpigmentation and fine scaling over the central palms, with mild lichenification and accentuation of palmar creases.

patient has been maintained on biweekly ixekizumab injections with regular clinic follow-up for the past 16 months and continues to show sustained clinical improvement without evidence of relapse or treatment-related adverse effects. The patient provided written informed consent for the publication of this case details and accompanying images.

Discussion

Psoriasis is a complex immune-mediated skin disease that leads to chronic inflammation and accelerated skin cell growth in genetically predisposed individuals. Chronic plaque-type psoriasis represents its typical primary clinical manifestation, although other clinical subtypes with unique and independent characteristics have also been observed in clinical practice. One of these subtypes is palmoplantar psoriasis, which is considered a rare variant of psoriasis that mainly affects the skin of the palms and soles, accounting for 3–4% of all psoriasis cases.[1] Palmoplantar psoriasis is often accompanied by psoriatic lesions elsewhere on the body, rarely presenting in isolation. In 59% of cases, both the palms and soles are affected, compared to 21% with palms alone and 20% with soles alone. One study reported that patients with palmoplantar psoriasis have a 91% risk of nail involvement,[24] as was observed in our patient.

To date, the pathogenesis of new-onset psoriasis following COVID-19 vaccination remains unclear. However, most current theories on this topic are based on the mechanism of its development following other vaccines such as influenza, Bacillus Calmette-Guérin (BCG), tetanus-diphtheria, and pneumococcal polysaccharide. For example, following vaccinations for influenza, BCG, or tetanus-diphtheria toxoid vaccination, the production of interleukin (IL)-6 increases. Thus, Th17 immune cells become less regulated and proliferate. These cells are particularly implicated in the pathogenesis of psoriasis.[25] Elevated Th17 responses have also been observed in patients with severe COVID-19 infection.[26] Moreover, BCG and pneumonia vaccination increase IL-2, IL-12, tumor necrosis factor-α, and interferon-γ levels—all of which play major roles in the pathogenesis of psoriasis, by promoting epidermal proliferation and the secretion of IL-8 to activate neutrophil ingression.[27]

Upon literature review, we identified one case series and 19 case reports describing new-onset psoriasis following COVID-19 vaccination, summarized in Table 1. Among the cases included in our literature review, females were slightly more affected than males, with a mean age of approximately 53 years. Among the reported subtypes of psoriasis, plaque

Table 1 Summary of Reported Cases of New-Onset Psoriasis Following COVID-19 Vaccination

Reference	Patients (n)	Sex/Age	Type of Psoriasis	Vaccine Type	Dose	Days of Onset	Treatment
Tran et al[3]	3	Pt1: Male/ 51 Pt2: Female/ 68 Pt3: Male/ 73	Pt1: Plaque Pt2: Plaque Pt3: Guttate	Pt1: Oxford-AstraZeneca AZD122 Pt2: Pfizer/BioNTech BNT162b2 Pt3: Pfizer/BioNTech BNT162b2	Pt1: 3 Pt2: 3 Pt3: 1	Pt1: 7 Pt2: 30 Pt3: 30	Calcipotriol/ Betamethasone + Antihistamines
Gargiulo et al[4]	2	Pt1: Female/ 82 Pt2: Male/ 29	N1: Plaque N2: Pustular	Pt1: Pfizer/BioNTech BNT162b2 Pt2: Pfizer/BioNTech BNT162b2	Pt1: 3 Pt2: 2	N/A	Pt1: Secukinumab Pt2: Guselkumab
Nagrani et al[5]	2	Pt1: Female/ 56 Pt2: Male/ 65	Pt1: Plaque Pt2: Plaque	Pt1:Oxford-AstraZeneca AZD122 Pt2: Oxford-AstraZeneca AZD122	Pt1: 1,2 Pt2: 2	Pt1: 7,2 Pt2: 10	Emollients + Apremilast + Antihistamines
Ouni et al[6]	2	Pt1: Male/ 59 Pt2: Female/ 23	Pt1: Guttate Pt2: Guttate	Pt1: Pfizer/BioNTech BNT162b Pt2: Janssen COVID 19 vaccine, Ad26.COV2.S	Pt1: 1,2,3 Pt2: 1	Pt1: 7 Pt2: 2	Topical corticosteroid
Wei et al[7]	1	Male/ 24	Plaque	The Moderna mRNA-1273	2	24	Ixekizumab + Acitretin 25 mg
Cortonesi et al[8]	1	Female/ 82	Plaque	Pfizer/BioNTech BNT162b	1	7	Ixekizuma
Ständer et al[9]	1	Female/ 50	Plaque	Pfizer-BioNTech BNT162b2	2	7	Topical betamethasone/ calcipotriol; methotrexate 15 mg/ week
Magro et al[10]	1	Male/ 58	Guttate	Pfizer-BioNTech BNT162b2	N/A	14	N/A
Song et al[11]	1	Female/ 23	Guttate	Pfizer/BioNTech BNT162b	1	2	Calcipotriol/ Betamethasone

(*Continued*)

Table 1 (Continued).

Reference	Patients (n)	Sex/Age	Type of Psoriasis	Vaccine Type	Dose	Days of Onset	Treatment
Lehmann et al[12]	1	Female/ 79	Guttate	Pfizer/BioNTech BNT162b	1	10	Calcipotriol/ Betamethasone + NBUVB
Pesqué et al[13]	1	Male/ 72	Guttate	The Moderna mRNA-1273	2	6	Calcipotriol/ Betamethasone
El Mashaari et al[14]	2	Females/ N/A	Palmoplantar pustulosis	Pt1: Pfizer/BioNetech BNT162b Pt2: Sinopharm [Vero Cell]-Inactivated COVID-19 vaccine	N/A	Pt1: 7 Pt2: 14	Pt1: Guselkumab 100 mg (0, 4, then every 8 weeks). Pt2: Calcipotriol/ Betamethasone
Hsu & Tsai.[15]	1	Female/ 54	Palmoplantar pustulosis	Pfizer/BioNTech BNT162b	2	14	Ixekizumab (160 mg then 80 mg biweekly); cyclosporine on flare
Elamin et al[16]	1	Female/ 66	Generalized pustular	Oxford-AstraZeneca AZD122	1	21	Acitretin 25 mg
Frioui et al[17]	1	Male/ 20	Generalized pustular	Pfizer/BioNTech BNT162b	1	4	Topical corticosteroid + Acitretin 25 mg
Romagnuolo et al[18]	1	Female/ 64	Annular pustular	Pfizer/BioNTech BNT162b	1	N/A	Methotrexate 15 mg/week
Lamberti et al[19]	1	Female/ 45	Nail	Pfizer/BioNTech BNT162b	2	3	N/A
Ricardo et al[20]	1	Female/ 76	Nail	Pfizer/BioNTech BNT162b	2	7	Topical corticosteroid
Ruggiero et al[21]	1	Female/ 47	Nail	Pfizer/BioNTech BNT162b	2	17	Ixekizuma
Chhabra et al[22]	1	Male/ N/A	Annular plaque	Oxford-AstraZeneca AZD122	1	14	N/A

Abbreviations: Pt: Patient, N/A: Not available.

psoriasis was the most common, followed by guttate, pustular, nail, and annular psoriasis. Pfizer-BioNTech was the most common COVID-19 vaccine type linked to new-onset psoriasis, followed by AstraZeneca, Moderna, and Janssen. Furthermore, psoriasis has been reported to develop following the first, second, and third vaccine doses, with some patients developing the condition after every dose. The mean time to onset of *de novo* psoriasis following vaccine administration has been reported to be ~10 days. Most patients showed good responses to topical treatments, although some of them required treatment with conventional systemic medications and biologics. Unfortunately, palmoplantar psoriasis is often resistant to many topical and systemic therapies, meaning that many patients eventually require biologics-based therapies.[2]

Treatment of moderate-to-severe palmoplantar psoriasis includes acitretin, phototherapy, and traditional immunosuppressive drugs. However, the majority of patients eventually transition to biological therapy because of the adverse effects of conventional systemic treatments. As the pathogenesis of palmoplantar psoriasis involves overproduction of the pro-inflammatory cytokines IL-17 and IL-23, recent therapeutic advances have targeted this pathway using biologic agents that inhibit IL-17 and IL-23, yielding promising outcomes. A previous retrospective study comparing the effectiveness of IL-17 and IL-23 inhibitors in treating palmoplantar psoriasis found no significant difference between them.[28] In our case, we used ixekizumab, a monoclonal antibody that inhibits IL-17. The loading dose is 160 mg subcutaneously, followed by 80 mg every 2 or 4 weeks. Clinical trials have demonstrated strong efficacy, with up to 89% of patients achieving PASI75 and 70% achieving PASI90 at 12 weeks. Long-term studies confirm a sustained response, with over 80% maintaining PASI75 after 3 years. The safety profile is acceptable, with common adverse effects including mild infections, nasopharyngitis, and injection site reactions. However, caution is advised in patients with a history of inflammatory bowel disease because of the risk of potential exacerbation.[29]

Conclusion

This case report presents new-onset palmar psoriasis following mRNA-based COVID-19 vaccination, which was successfully managed with ixekizumab. To date, cases of palmar psoriasis have been rare in the literature. Given the importance of the COVID-19 vaccine in terms of controlling the spread of SARS-CoV-2 infection, recognizing even rare types of psoriasis as adverse events connected to these vaccines is crucial for timely diagnosis and management.

Abbreviations

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), coronavirus disease 2019 (COVID-19), Bacillus Calmette-Guérin (BCG), messenger ribonucleic acid (mRNA), interleukin (IL).

Ethical Approval

The study was approved by Imam Abdulrahman Bin Faisal University Institutional Review Board on June 9, 2024 (IRB-2024-01-467), and we confirm that institutional approval was required for publication of this case details.

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Disclosure

The authors report no conflicts of interest in this work.

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