

Case of de novo nail psoriasis triggered by the second dose of Pfizer-BioNTech BNT162b2 COVID-19 messenger RNA vaccine



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INTRODUCTION

Regulatory agencies across the globe had given emergency use authorization of the highly effective Pfizer-BioNTech COVID-19 messenger RNA (mRNA) vaccine (BNT162b2) in view of the ongoing COVID-19 pandemic. In phase 3 trials, the vaccine, which uses an mRNA platform encoding the spike glycoprotein of SARS-CoV-2, confers 52% protection against COVID-19 12 days following the first dose and 95% protection after the second dose, if administered 3 to 4 weeks apart in individuals without previous SARS-CoV-2 infection.¹

Although the BNT162b2 vaccine has shown excellent safety data, a wide range of dermatologic reactions have been reported with mass vaccination against SARS-CoV-2. We present, to our knowledge, the first case of a 76-year-old woman with de novo nail psoriasis associated with Pfizer-BioNTech BNT162b2 COVID-19 mRNA vaccine administration.

CASE REPORT

A 76-year-old woman with a history of osteoarthritis affecting both hands and asthma presented with a 7-week history of severe onycholysis affecting the fingernails of both hands. Her nail changes first appeared 7 days after receiving the second dose of the Pfizer-BioNTech BNT162b2 COVID-19 mRNA vaccine. She had pain at the vaccine injection site and malaise for 24 hours after receiving her first and second doses but no other symptoms. She reported a history of asymptomatic SARS-CoV-2 infection 6 months prior to vaccination confirmed by positive COVID-19 polymerase chain reaction and antibody test results. She related nail sensitivity, particularly in the bilateral thumbnails, with moderate impairment

Abbreviation used:

mRNA: messenger RNA

in performing daily activities. She denied previous manicuring or trauma. Medications included omeprazole, melatonin, and intranasal fluticasone, none of which is associated with onycholysis or photo-onycholysis. Findings of physical examination were significant for severe distal onycholysis, subungual hyperkeratosis, nail pitting, oil drops, splinter hemorrhages, and proximal nailfold erythema affecting multiple fingernails (Fig 1, A and B). Nail dermoscopic evaluation revealed red dots and dilated capillaries in the proximal nailfold. Her toenails were unaffected, and she had no rashes involving her skin or scalp. Dermatopathology of nail clippings showed subungual parakeratosis and entrapment of neutrophils, without evidence of hyphae. Psoriatic arthritis was excluded on the basis of the history, physical examination findings, and plain hand radiographs, which showed degenerative changes of the small joints of both hands, without radiographic evidence of inflammatory arthropathy. We diagnosed her with nail psoriasis based on clinical examination findings, exclusion of other conditions associated with onycholysis, and supporting histopathologic findings. Disease severity was assessed by selecting the most affected nail at baseline, with a target Nail Psoriasis Severity Index score of 18 points (range, 0-32 points). Due to the temporal relationship between COVID-19 vaccine administration and her nail findings, a triggering effect of the

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Fig 1. **A**, Bilateral thumbnails showed severe distal onycholysis, subungual hyperkeratosis, oil drops, and irregular nail pitting, which was more prominent on the thumbnail of the right hand. **B**, The small, ring, long, and index fingernails of the right hand demonstrated severe distal onycholysis, subungual hyperkeratosis, irregular nail pitting, oil drops, and splinter hemorrhages. **C**, Two months after treatment with clobetasol 0.05% ointment under occlusion, the small, ring, long, and index fingernails of the right hand showed significant improvement in all nail psoriasis features and residual Beau lines. **D**, The long fingernail of the right hand demonstrated a residual Beau line affecting the middle aspect of the nail plate.

Pfizer-BioNTech BNT162b2 COVID-19 mRNA vaccine was likely.

The patient was prescribed clobetasol 0.05% ointment nightly for 3 weeks, followed by 1 week off of treatment, for 2 months. She was advised to apply the medication under occlusion to the affected nails after clipping back the onycholytic nail plate. Significant improvement in all nail findings was seen 2 months after treatment initiation (Fig 1, C), with a posttreatment target Nail Psoriasis Severity Index score of 6 points (range, 0-32 points). At follow-up, Beau lines, which were not evident at baseline, were noted in most fingernails (Fig 1, D).

DISCUSSION

Cutaneous psoriasis flares are uncommon reactions associated with COVID-19 mRNA vaccination. However, de novo psoriasis, and a case specifically involving the nail unit, has never previously been reported, to the best of our knowledge. In a registry-based study of 414 patients with cutaneous reactions following Pfizer-BioNTech (BNT162b2) and Moderna (mRNA-1273) COVID-19 mRNA vaccines, including 16 patients with previous

laboratory-confirmed SARS-CoV-2 infection, 2 patients experienced psoriasis flares.² In addition, a patient with a 24-year history of plaque psoriasis, in remission (psoriasis area severity index, 0 points) from deucravacitinib treatment as part of a clinical trial, experienced a marked exacerbation of his psoriasis (psoriasis area severity index, 18.5 points) 5 days after administration of Pfizer-BioNTech BNT162b2 second dose.³ The mechanisms responsible for these reactions are unclear. In an observational study, administration of the influenza vaccine was associated with 43 cases of induction (16.3%) and exacerbation (83.7%) of psoriasis, which is hypothesized to be secondary to immune dysregulation due to viral component and/or vaccine adjuvants.⁴ A similar mechanism is plausible for COVID-19 mRNA vaccination—associated psoriasis. Of note, other mRNA vaccines, including bacillus Calmette-Guérin and diphtheria vaccines, may promote interleukin 6 production and recruitment of T helper 17 cells, important contributors in psoriasis pathogenesis.³⁻⁵

Beau lines, transverse grooves in the nail plate that occur due to a temporary arrest of nail matrix

proliferation, have been reported following SARS-CoV-2 infection.^{6,7} Additional nail findings described in association with COVID-19 include transverse leukonychia, onychomadesis, red half-moon sign, transverse orange discoloration, and diffuse red-white nail bed discoloration.⁸ In our case, the Beau lines were noted at follow-up, which took place approximately 4 months following administration of the second dose of Pfizer-BioNTech COVID-19 vaccine. Based on the average fingernail growth rates (1 mm/mo) and the location of the Beau lines approximately 4 mm from the cuticle, the COVID-19 vaccine was the likely cause. Therefore, both SARS-CoV-2 infection and, now, COVID-19 vaccination are associated with Beau lines. Other adverse reactions associated with both SARS-CoV-2 infection and COVID-19 vaccines include pernio/chilblains, erythromelalgia, and psoriasis-pityriasis rosea–like exanthems.² Because these vaccine reactions mimic COVID-19 manifestations, it is hypothesized that some dermatologic findings observed with SARS-CoV-2 infections are due to immune responses rather than a consequence of direct viral infection.² Beau lines do not require treatment and resolve, on average, 6 months after the presentation if the inciting factor is no longer present.

Exacerbations, and particularly de novo cases, of psoriasis following COVID-19 vaccination are exceedingly rare and treatable and, as such, should not discourage vaccination. Nevertheless, due to the accelerated global vaccination campaign, more cases of vaccine-associated psoriasis are expected. Physicians should be aware that psoriasis is a

potential adverse vaccine-associated reaction and provide prompt and appropriate diagnosis and treatment.

Conflicts of interest

Dr Lipner has served as a consultant for Ortho-Dermatologics, Verrica, and Hoth Therapeutics. Dr Ricardo has no conflicts of interest to declare.

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