



Post-SARS-CoV-2 vaccination COVID toes and fingers

Two case reports and a short literature review

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Dear Editor,

We have observed two patients who developed painful pernio-like plaques on fingers and/or toes after vaccination against severe acute respiratory corona virus type 2 (SARS-CoV-2), resembling corona virus disease (COVID) toes or fingers.

The first patient was a 78-year-old woman with no history of rheumatic disease, Raynaud syndrome, or perniones, who presented with painful erythematous plaques on the distal part of all her fingers 4 days after booster vaccination (third shot) with the mRNA BONT162b2 vaccine (BioNTech–Pfizer). She presented with nail involvement on the second right digit. There was an interruption of the production of the nail plate. The nails of other affected digits remained normal. The cutaneous lesions persisted for between 2 and 8 weeks after vaccination (Fig. 1a).

The second patient—a 67-year-old woman—presented with erythematous plaques on the distal phalanx of the toes (Digits I–IV). She had had a COVID-19 disease in early summer of the previous year and got vaccinated later with the mRNA BONT162b2 vaccine (BioNTech–Pfizer) in September. With a delay of 4 weeks after the second shot, these painful lesions developed (Fig. 1b). She had no history of rheumatic disease or Raynaud syndrome. The lesions persisted for about 4 weeks. Skin biopsy was rejected by both patients.

These patients had no history of microembolism, thrombosis, or vascular disease. Antinuclear antibodies were negative as well. They had no systemic complaints in association with the pernio-like erup-

tions and no clinical signs of an active SARS-CoV-2 infection. Serologic antibody tests and real-time polymerase chain reaction (PCR) remained negative at the time of first presentation. The negative antibody test might indicate a lack of appropriate immune response to vaccination. Whether an impaired immune response is crucial for development of post-vaccination COVID toes and fingers requires further investigation. One should keep in mind that many patients with COVID toes and fingers without vaccination were negative as well.

Both patients were treated twice daily with topical corticosteroids (mometasone or prednicarbate ointment) with limited effect within 2 weeks. After consultation, the first patient used an occlusive dressing to increase efficacy, which resulted in a partial remission after 5 weeks. The second patient stopped topical corticosteroids after 3 weeks but reported a spontaneous improvement after 8 weeks.

Discussion

COVID toes and fingers, also known as pernio-like lesions or acute pseudoperniones, have been observed in patients infected with SARS-CoV-2 and in especially young patients without positive serology. It has been discussed that the underlying alterations of small cu-



Fig. 1 COVID-like finger (a) and toes (b).

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Table 1 COVID toes and fingers after vaccination against SARS-CoV-2

Patient	Vaccination	Time frame	Treatment	Outcome	Ref
82-year-old woman	BNT162b2, 1st shot	24 h	n. d.	n. d.	[5]
76-year-old man	mRNA1273, 2nd shot	1 week	Aspirin 81 mg/d	CR after 6 weeks	[6]
41-year-old woman	BNT162b2, 1st shot	4 days	Apixaban, low-dose aspirin	CR after 150 days	[7]
60-year-old woman	BNT162b2, 2nd shot	14 days	None	CR after 2 days	[8]
46-year-old woman	BNT162b2, 2nd shot	14 days	Clobetasol	PR	[9]
56-year-old woman	AZD1222, 1st shot	14 days	Systemic corticosteroids	CR	[10]
64-year-old woman	BNT1612b2, 2nd shot	3 days	Clobetasol	Stable disease	[11]
75-year-old woman	BNT1612b2, 1st shot	5 days	n. d.	n. d.	[12]
42-year-old-male	BNT162b2, 1st shot	12 days	n. d.	n. d.	[13]
3 patients	BNT162b2, 1st shot	n. d.	n. d.	n. d.	[4]
2 patients	BNT162b2, 2nd shot	n. d.	n. d.	n. d.	[4]
3 patients	AZD1222, 1st shot	n. d.	n. d.	n. d.	[4]
78-year-old woman	BNT162b2, 3rd shot	4 days	Mometasone	PR after 5 weeks ^a	present study
67-year-old woman	BNT162b2, 2nd shot	4 weeks	Prednicarbate	CR after 8 weeks ^a	present study

n. d. no data available, CR complete remission, PR partial remission
^aPresent study

taneous vessels are due to interferon type I release [1].

In a post-COVID-19 case series from the UK, erythema, swelling, and pernio-like plaques were observed on fingers in 56.2% and toes in 31.2%, with desquamation in 56.2% and acrocyanosis in 12.5%. The median duration of COVID toes/fingers was 191 days [2].

A systematic review of published data identified 433 children with pernio-like lesions. Their mean age was (12.58 ± 2.15) years and 53.6% of them were male. The nasopharyngeal SARS-CoV-2 real-time PCR test and anti-SARS-CoV-2 antibodies were mostly negative for the virus [3].

In contrast, COVID toes and fingers were less common after vaccination. Reviewing PubMed-listed publications, we identified 19 patients including the two reported here (Table 1). We also report the first case of nail involvement.

In an analysis of 414 cases vaccinated by mRNA vaccines against SARS-CoV-2, pernio-like eruptions were noted in 3 patients (1.1%) after the first shot of mRNA1273 (Moderna), and in 3 patients (8.8%) after first shot and in 2 (5.0%) after the second shot of BNT162b2 (BioNTech–Pfizer) [4].

Most of the reported cases were women in their second half of life [5–13].

The patient of Quiao et al. (2021) suffered from Sjögren's syndrome and rheumatoid arthritis. After application of rituximab for her rheumatologic disorders, she experienced a worsening of the post-vaccination COVID toes within hours [9]. While most cases have been reported after mRNA vaccination, recently, the case of a woman developing such lesions after the first shot of an adenoviral vector-based COVID vaccination (AZD1222; Oxford/AstraZeneca) was reported [10].

The lesions develop between 3 days to 4 weeks after vaccination. Pernio-like lesions persist for up to 8 weeks. Pain is not always present [11]. Histologic data demonstrated a dense lymphocytic perivascular infiltrate and some prominent endothelial cells, and interface dermatitis [5, 6].

If the adverse event was noted after the first shot, a second shot could be tolerated without a relapse, as reported by some authors [13].

Knowledge of such adverse events after COVID-19 vaccination is important. Since most cases demonstrate complete clearance, some even without any treatment, the prognosis is excellent.

Declarations

Conflict of interest U. Wollina declares that he has no competing interests.

Ethical standards All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. The patients gave their informed consent prior to their inclusion in the study.

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