



# What Are COVID Toes?

## A Case Study

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### ABSTRACT

**BACKGROUND:** COVID-19 symptoms mimic many other common conditions, making it difficult to identify patients infected with COVID-19. Adult patients may exhibit what is called “COVID toes” later in their course of illness. Noteworthy is that COVID toes may be the only symptom in otherwise asymptomatic young adults and children.

**CASE:** We present experience with an adult female patient residing in the United States with presumed COVID-19 infection who was self-isolating with illness not severe enough to require hospitalization. COVID toes were one symptom experienced as a part of her illness. Because COVID toes are usually seen in the recovery phase of COVID-19, and often in patients with less severe cases, many providers are unfamiliar with this new symptom.

**CONCLUSION:** Familiarity with COVID toes will help foot care providers to identify patients who may not have been diagnosed with COVID-19 but could still be infectious and need to be isolated. COVID toe signs may be subtle and often mimic other conditions such as chilblains/pernio, thus a thorough history and physical examination are required.

**KEY WORDS:** chilblains, coronavirus, COVID toes, COVID-19, foot, foot care, SARS-CoV-2, toes

### CASE STUDY

N.M., aged 45 years, residing in the United States, became ill on March 12, 2020, with diarrhea, dry cough, mild sore throat, eye irritation, swollen lymph nodes, abdominal pain, intermittent hypoxia as low as 84 (briefly after climbing stairs), chest/rib pain during deep inhalation, altered sense of smell, extreme fatigue, and loss of appetite. Her temperature was elevated 99.4°F. At the beginning of this illness, she was instructed by her primary care provider (PCP) to self-isolate, initiate supportive treatment of presumed COVID-19 viral illness, monitor, and contact her PCP if symptoms worsened. As her initial symptoms improved, she noticed her feet and toes felt hot and had an itchy pain, “like a mosquito bite.” Other neuropathic-type symptoms included “the balls of my feet lose feeling, have fizzing, or feel like my toes are in a spider web.” Photos were taken of her feet on April 19, 2020, approximately 7 days after she became aware of the altered sensations. At that time, the fingers were peeling around the nails, felt hot and tight, and looked shiny and pink, which was thought to be from repeated hand washing. N.M. noted the absence of lunula in the toenails (Figure). COVID-19 test was done at the first opportunity, 21 days after symptom onset, and was

negative. She did not require hospitalization and is awaiting an antibody test to see if COVID-19 is detected.

### DISCUSSION

#### Pandemic

The SARS-CoV-2 virus was first identified in China in December 2019 and has since rapidly traveled worldwide, being labeled a pandemic by the World Health Organization on March 11, 2020.<sup>1</sup> SARS-CoV-2 causes COVID-19, with initial symptoms included respiratory distress and pneumonia of unknown cause. Other organ system involvement was soon identified that affected blood clotting and necrosis of the skin. Health care professionals from all specialties and disciplines were deployed to meet the changing needs of patients, including skin specialists/dermatologists acting in triage and as medical generalists.<sup>2</sup>

#### Cutaneous Symptoms of COVID-19

COVID-19 has a range of manifestations and attacks a variety of organs including the skin. It is unknown how often cutaneous symptoms are associated with the diagnosis of COVID-19, although 20% of acutely ill patients were observed to have skin lesions receiving care in an Italian hospital.<sup>3</sup>

A nationwide consensus study conducted in Spain to gather more information on the range of different cutaneous manifestations of the disease included 375 cases of COVID-19 with skin symptoms. The total number of COVID-19 cases at the time was unknown. Five clinical patterns emerged including (1) acral areas of erythema-edema with some vesicles or pustules (pseudo-chilblain), (2) other vesicular eruptions, (3) urticarial lesions, (4) maculopapules, and (5) livedo or necrosis (including acral ischemia).<sup>4</sup>

Severe cases of COVID-19 can lead to hypercoagulation and disseminated intravascular coagulation presenting with

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**Figure.** COVID Toes.

acroischemia with finger and toe cyanosis, cutaneous bullae, and dry gangrene. Approximately 6% of COVID-19-associated skin lesions occurred in those who were critically ill, primarily older adults.<sup>5</sup>

### COVID Toes

The terms “chilblains” and “pernio” typically refer to a condition that affects mostly young to middle-aged individuals and predominantly women during the winter months—particularly those who are exposed to nonfreezing temperatures and increased humidity.<sup>6</sup> Chilblains are itchy and/or tender red or purple bumps that occur as a reaction to cold and are a localized form of vasculitis. Once the diagnosis of chilblains is made, first-line treatment includes avoiding cold, damp environments and wearing gloves and warm socks.

The pseudo-chilblain pattern tends to appear late in the evolution of the COVID-19 disease and represents a mild symptom and is less commonly associated with viral infections. Notably different from the typical time of presentation, the skin manifestations occur in a warm weather period. The term “COVID toes” emerged and refers to this mild symptom, very much like chilblain/pernio, without exposure to cold.<sup>4</sup>

A recent study suggests that areas of erythema-edema with or without vesicles or pustules have occurred on the toes and feet in 19% of cases exhibiting cutaneous symptoms.<sup>4</sup> In another study, painful acral red purple papules with or without vesicles were observed in 15.3% of patients diagnosed with COVID-19.<sup>7</sup> Often these symptoms are mild; however, pain can be severe enough to limit ambulation and affect sleep.<sup>8</sup>

While pseudo-chilblain lesions can appear with other COVID-19 respiratory symptoms, they do not always. Chilblains may be the only symptom of COVID-19, and a fever and dry cough may be minimal or even absent. These patients may have a COVID-19 infection and may be contagious.<sup>9</sup>

Toe and foot lesions of red to violaceous macules and dusky, purpuric plaques scattered on the mid and distal aspects of the toes have also been reported in children and adolescents with

either mild symptoms of viral upper respiratory tract infection or contact with a symptomatic individual 1 to 2 weeks prior to the rash.<sup>10</sup> These younger individuals also tested negative to COVID-19 polymerase chain reaction (PCR) testing, as this test is most sensitive at the onset of symptoms.

### History and Physical Exam

Taking an accurate history of any skin changes is very important, including whether or not the individual has had recent exposure to cold temperature; however, the condition manifests even without exposure to cold weather. Cold temperature is more likely in true chilblains rather than something like COVID toes in the absence of cold weather in the midst of a pandemic—hence pseudo-chilblains. Other health conditions such as connective tissue disorders and exposure to ill individuals are key to recognition of possible COVID-19 symptoms.

Observing and describing any skin condition and noting any changes, specifically for subtle pink, red, or blue patches on the feet and toes, are important. Assessing for ill-fitting footwear and bony deformities that may create pressure points and may mimic COVID toes needs to be documented. Performing vascular, musculoskeletal, and neurologic exams is also recommended. Coagulopathy and risk of thrombosis including deep vein thrombosis, peripheral artery embolism, and micro emboli have been associated with COVID-19 and may lead to discolored or necrotic areas on the feet and other areas of the body. New onset or rapid progression of lower-limb weakness and paresthesia following a viral illness such as COVID-19 can be the first symptom of Guillain-Barré syndrome. New onset of mild sensory neuropathy should also be noted. Other differential diagnoses for acral lesions may include idiopathic chilblains, chilblains lupus erythematosus, vasculitis, pernio, Aicardi-Goutières syndrome, or a connective tissue disorder.<sup>8</sup> Given the prevalence of the COVID-19, a heightened index of suspicion is indicated when confronting pernio-like and pseudo-chilblains symptoms, especially in a warm weather.

As foot care clinicians, it is important to be aware of this mild symptom of COVID-19. Identifying these lesions may assist in the identification of COVID-19 carriers and allow for testing and isolation, thereby limiting disease spread to more susceptible individuals. Social distancing is impossible when providing personal care; however, wearing a face mask and frequent handwashing are infection control measures, with which we are all familiar, should be employed with each patient encounter. Even when not otherwise ill, individuals with COVID toes may be capable of virus transmission; thus, it is important to counsel them on prevention measures.

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