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Title

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Journal

Proceedings of UCLA Health, 26(1)

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Publication Date

2022-05-19

CLINICAL VIGNETTE

Pernio not “COVID-19 Toes”

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A 46-year-old male without significant past medical history presented to Urgent Care with two weeks rash on his feet. The lesions were limited to the dorsal toes and included swelling with macules and papules. He complained of mild soreness but otherwise noted no changes. The lesions seemed to improve when he was indoors wearing socks and slippers and worsened when he was outside in sandals. He recalled an extended time outdoors in sandals on a colder than usual spring day and extending into late night. He denied any fever, chills, rhinorrhea, nasal congestion, shortness of breath, cough, muscle aches, fatigue, change in taste or smell, nausea, vomiting, COVID-19 contacts, or recent travel. He presented for evaluation after seeing an online report online about “COVID-19 toes” which closely resembled his lesions.

On examination his vital signs were normal, and he had bilateral violaceous papules and macules on the dorsal aspects of most toes. These were nontender without fluctuance or induration. Otherwise, his skin was without rashes and his cardiovascular, respiratory, gastrointestinal, and musculoskeletal systems were within normal limits. A preliminary diagnosis of Pernio was made and later confirmed by negative serum studies including auto-immune markers, protein electrophoresis with immunofixation, COVID-19 PCR (Polymerase Chain Reaction) and antibodies levels. The patient was advised to keep the areas warm and follow up for further evaluation if the problem failed to resolve. Future discussion with his Primary Care Provider revealed the lesions had resolved two weeks after initial evaluation.

Pernio, or chilblains, is a skin condition of unclear pathophysiology which causes erythematous to violaceous papules and macules involving dorsal extremities. It is specifically caused by cold exposure with symptoms manifesting within one day of exposure and typically lasting several weeks. They symptoms improve with warming and worsen again with further cold exposure.¹ Since the condition is precipitated by cold most cases are found in cold and/or wet climates. Middle-aged females are the most commonly affected, but cases are reported in all ages and both genders. Some patients develop chronic Pernio which improves in warmer months and then recurs during colder periods. Underlying chronic or inflammatory medical conditions appear to predispose patients to indolent disease.^{2,3} Pernio is rare with recently reported rate of 5.2 per 100,000 person-years (95% CI 4.8-5.6).⁴ Several secondary causes have been postulated but only an association with systemic or cutaneous lupus erythematosus seems to be consistent.

These lesions are classified as “chilblain lupus erythematosus.”⁵

Diagnosis is made on the basis of historical and physical findings. The typical pattern of onset after cold exposure and improvement with warming along with pathognomonic findings on exam of edematous, erythematous to violaceous papules and macules are sufficient to make the diagnosis. Serum testing for other inflammatory diseases could be undertaken if the history reveals other symptoms or exposures or risks for inherited conditions. Biopsy can be considered if the diagnosis was in question or in support of inconclusive laboratory testing. Typical biopsy findings include papillary dermal edema and superficial and deep, moderate to dense lymphocytic infiltrate surrounding blood vessels and eccrine glands. Less commonly lymphocytic vasculitis and necrotic keratinocytes may be present.^{6,7}

The patient presented to Urgent Care because he was concerned his lesions were a manifestation of COVID-19. There may be a relationship between the two as cases of pernio increased to 28.6 per 100,000 person-years (95% CI 26.8-30.4) during the last 6 months of 2020.⁴ The relationship is still under investigation as many occurred without cold exposure. Data suggests an inflammatory response as the mechanism. Other studies reported confounding conditions such as lifestyle changes during the pandemic caused potential increased low-level exposures to cold, i.e. patients not wearing shoes at home. Lesions generally appeared 1 to 4 weeks after COVID-19 symptoms and resolved 4-8 weeks later. Most patients were COVID-19 PCR negative at the time of pernio diagnosis.^{4,8}

Other potential diagnoses that mimic pernio include cryoglobulinemia, cold panniculitis, and Raynaud phenomenon. These can be considered but generally ruled out based on their pattern of distribution, appearance, and timing.

Treatment for pernio consists of warming the affected areas and avoiding further exposure to cold. Given the combination of inflammation and vascular insult, topical oral and intralesional steroids and the calcium channel blocker nifedipine have all been used in more severe and persistent cases. Data on steroid efficacy is lacking, but small studies have reported benefit from nifedipine.^{9,10}

Given the current limited data on pernio and COVID-19, it may be tempting to diagnose the lesions as COVID-19 related. This

patient, had evidence for a diagnosis of pernio and not “COVID-19 toes”. The patient had clear cold exposure and clear improvement with warming, he also had no COVID-19 symptoms, contacts, or travel. Direct testing for virus by PCR was done but it did not conclusively rule out a COVID association given the typical delayed onset of symptoms in COVID related cases. Has his condition been due to COVID-19, his antibody testing would likely have been positive. In any case, even if the pernio was caused by COVID-19 he was no longer contagious and had no further symptoms. No further COVID evaluation or epidemiological tracing was necessary.

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