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An illustrative case of pseudo-chilblains in tropical Singapore – what is its significance?

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INTRODUCTION

A diverse range of cutaneous manifestations have been reported in patients with COVID-19 infection. Five morphological patterns have been previously described by C. Galván Casas et al, including livedo or necrosis, pseudo-chilblains, vesicular, urticarial and maculopapular eruptions.[1] We report the dermatological manifestation of a pseudo-chilblain eruption in a local patient with confirmed COVID-19 infection.

CASE DESCRIPTION

A 48 year old Chinese male with no past medical history was admitted for a two-day history of fever associated with infective changes on chest radiograph. He was subsequently confirmed to have COVD-19 infection from reverse transcriptase polymerase chain reaction (RT-PCR) testing and was initiated on symptomatic treatment.

One day after the onset of respiratory symptoms, he developed rashes over the palmar surfaces of both hands which were observed to be exacerbated by colder ambient temperature as well as hand placement in a dependent position. There was no associated pain or itch. He did not have a history of a similar dermatosis that was precipitated by colder temperatures. Systemic review was unremarkable and there was no personal or family history of autoimmune or haematological diseases. He is an ex-smoker of 10 pack years and stopped smoking in 2015. On clinical examination, there were erythematous-violaceous macules coalescing into mottled reticulated patches on the palmar surfaces of both hands (Fig. 1a and Fig. 1b). Significantly, there was an absence of Raynaud's phenomenon, digital infarcts, splinter haemorrhages and digital pulp ulceration.

Laboratory investigations performed to exclude an underlying haematological and autoimmune cause of perniosis were unremarkable. His full blood count was normal and a cryoglobulin screen was negative. Anti-nuclear antibody (ANA) titre was 1:80, and his

complement levels were in the normal range (C3: 1.12g/L; C4: 0.42g/L). A skin biopsy was not performed in part due to the transient self-resolving nature of his lesions as well as prevailing infection control protocols.

He was diagnosed to have a pseudo-chilblain eruption secondary to COVID-19 infection. The patient remained well throughout admission and was provided with advice to keep his hands warm. Spontaneous improvement of the rashes was noted in tandem with resolution of his respiratory symptoms by the time of discharge (after 14 days).

DISCUSSION

Chilblains (perniosis) is a dermatosis conventionally precipitated by cooler temperatures and is an exceedingly rare condition in our equatorial climate. Not surprisingly, whilst reports of pseudo-chilblain eruptions associated with COVID-19 infection have been abundant in countries in the Northern hemisphere, climatic variations between geographical regions could possibly contribute to the paucity of similar cases in our tropical country. To the best of our knowledge, we describe our first locally reported case of a pseudo-chilblain eruption arising in a Chinese patient with COVID-19 infection.

The pathogenesis of pseudo-chilblain eruptions from COVID-19 infection has been attributed to various mechanisms including microangiopathic changes induced by elevated Type 1 interferon levels, as well as direct viral-mediated endothelial damage.[2] In the spectrum of cutaneous eruptions (apart from exanthems and urticaria) associated with COVID-19 infection, pseudo-chilblain lesions represent a mild end of reactive vasculopathy. They have been associated with a good prognosis, both dermatologically and from the infection standpoint. This contrasts with patients who develop retiform purpura and frank perniosis (reflecting an underlying severe thrombo-occlusive inflammatory vasculitis and cytokine storm), who were found to suffer from poorer outcomes including severe acute respiratory

distress syndrome (ARDS) and even death.[3] Mirroring the aforementioned findings, our patient experienced a mild disease course.

More importantly, we wish to underscore the importance of distinguishing a pseudo-chilblain eruption from frank perniosis (chilblains) as there are important clinical and prognostic implications. Chilblain eruptions are characterized by tender and fixed purpuric lesions which are acrally distributed, precipitated by colder temperatures and typically do not change with position. The patho-mechanism underpinning chilblains involves a thrombotic or vasculitic process, and in the evaluation of patients with suspected perniosis, it is imperative to exclude an underlying autoimmune disease or haematological condition (e.g. cryoglobulinemia, thrombophilia and haematological malignancies).[4] Conversely, pseudo-chilblain lesions are transient, blanchable purpura which may change with position. They are invariably benign and without any systemic associations. A simple bedside test of elevating the affected extremities (resulting in rapid resolution of lesions in pseudo-chilblain eruptions) may serve as a useful screening tool to differentiate between these two entities.

When encountering an acute violaceous acral eruption, a close differential that needs to be considered would be papular purpuric gloves and socks syndrome of parvovirus B19 infection. In contrast to pseudo-chilblains, this tends to be more extensive to involve the forearms and shins, be non-blanchable and not altered by positional changes.

Our report illustrates the manifestation of a pseudo-chilblain eruption associated with COVID-19 infection. Whilst it has hitherto remained a rare manifestation of the disease locally, it is imperative that physicians are cognisant and familiar with its clinical presentation, and its distinguishing features from true chilblains. Recognition of this rare but distinctive presentation should prompt physicians to screen for COVID-19 infection, thus enabling the crucial detection of asymptomatic/pauci-symptomatic patients who require expedient isolation, testing and screening of contact cases. We suggest that when a pseudo-chilblain eruption is encountered

and is temporally consistent with a COVID-19 infection (the latter can be either concurrent or antecedent), it may be treated conservatively and be monitored for resolution in tandem with patient's recovery.[5] This would minimize the need for excessive investigations. Evaluation for other viral (e.g., parvovirus B19 infection), autoimmune and/or haematological aetiologies should also be considered when a persistent acral purpuric eruption that is fixed regardless of limb elevation is encountered. In such instances, a skin biopsy would also be warranted to look for histological evidence of thrombotic vasculopathy or cutaneous small vessel vasculitis.

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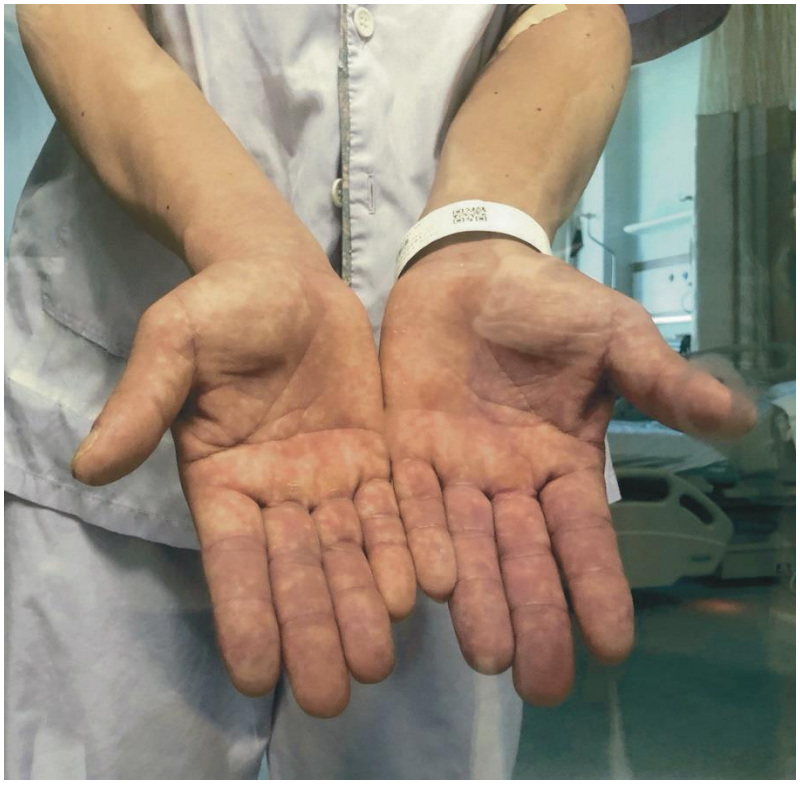

Fig. 1a Violaceous macules coalescing into reticulated patches on both palmar surfaces.

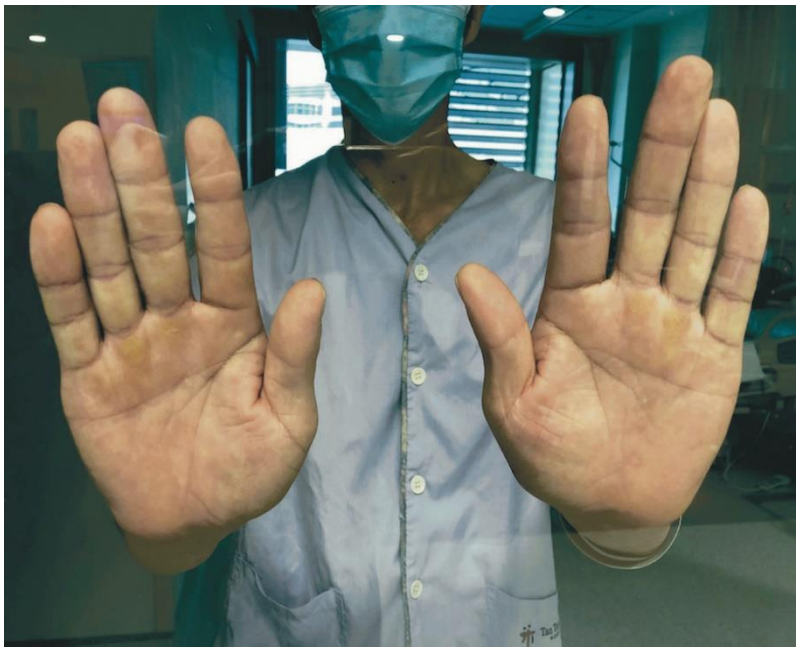

Fig. 1b Resolution of rashes upon lifting the hands against gravity.