

# Arterial hand ulcer: A common disease in an uncommon location



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## CASE REPORT

A 62-year-old man presented with a painful ulcer on the dorsal right hand. He had sustained an abrasion with focal skin loss while loading a package into his car 3 months prior and reported a progressively enlarging ulcer at the site of injury. Seen twice in the emergency department, he was initially treated with dicloxacillin for 1 week without improvement and then with doxycycline with minimal improvement after 1 additional week.

The patient's medical history was significant for hepatitis C, hypertension, and chronic obstructive pulmonary disease. His review of systems was unremarkable with no fevers, fatigue, myalgias, arthralgias, or gastrointestinal symptoms. There was no recent travel outside of the United States.

On examination, he was afebrile with a blood pressure of 110/67 and heart rate of 73 beats per minute. The right dorsal hand showed a sharply demarcated, 3-cm ulcer with thick overlying crust and an adjacent 1-cm crusted ulcer, each with surrounding erythema (Fig 1). Finger range of motion was limited secondary to pain. There was no lymphadenopathy. Radial pulse was 1+ with normal capillary refill and warmth. Radiograph the hand showed no osseous defect. Wound cultures found coagulase-negative *Staphylococcus* and *Candida parapsilosis*, and tissue cultures for atypical mycobacterial and deep fungal organisms were negative. The patient was continued on doxycycline and wound care with only slight improvement. A complete blood count, metabolic panel, and erythrocyte sedimentation rate were all normal.

Histopathology (Fig 2) found a sparse, superficial lymphocytic infiltrate with increased small, thin-walled blood vessels, some erythrocyte extravasation, and epidermal acanthosis. There were no

### Abbreviation used:

PG: pyoderma gangrenosum

collections of neutrophils or granulomatous infiltrate and no evidence for either vasculitis or vascular occlusion.

At this point, infection, pustular dermatosis of the dorsal hands, malignancy, vasculitis, vasculopathy, and embolic disease were felt to be unlikely, and pyoderma gangrenosum (PG) was not suspected because of lack of clinically consistent features and pathology. The patient was in significant pain with tendons now being exposed and was sent to plastic surgery for grafting.

A preoperative evaluation found a weak right radial pulse relative to the left and a systolic blood pressure of 74 on the right arm and 145 on the left arm, which prompted a duplex ultrasound scan. This finding demonstrated apparent occlusion of the right subclavian, axillary, and radial arteries. On further questioning, the patient recalled a clavicular fracture in 1987 that required surgical repair and reported pain with use of the right upper extremity ever since. The location of the clavicular plate and screw corresponded with the level of subclavian stenosis. He underwent a right carotid-to-ulnar bypass, and the hand ulcers and pain completely resolved (Fig 3).

## DISCUSSION

Arterial ulcers are caused by lack of blood perfusion, often secondary to atherosclerosis, leading to painful, necrotic ulcers. They are typically located on the distal lower extremities and rarely cause ulceration of the hands. The differential

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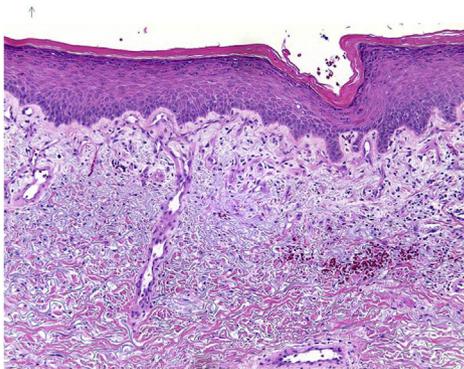
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**Fig 1.** Hand ulcer with sharply demarcated edges before treatment.



**Fig 2.** Sparse lymphohistiocytic infiltrate with increased vascularity. (Hematoxylin-eosin stain; original magnification:  $\times 100$ .)

diagnosis of nonhealing hand ulcers, with no known history of vascular compromise, typically includes infectious etiologies, PG, pustular dermatosis of the dorsal hand, vasculitis, vasculopathy, embolic disease, and malignant neoplasms. In our case, the history of inciting trauma preceding ulcer formation (pathergy), as well as the lack of response to wound care and antibiotics and negative cultures, might all have suggested PG.<sup>1</sup> However, although not completely diagnostic, a neutrophilic dermal infiltrate would be expected in PG and, classically, the morphology would show a violaceous, undermined border. Neither of these was present in our patient.<sup>1</sup> Negative cultures and lack of consistent histologic features did not support infectious etiologies such as bacterial infections, deep fungal infections, atypical mycobacteria, localized cutaneous leishmaniasis, vasculitis, vasculopathy, or emboli.



**Fig 3.** Resolved arterial hand ulcers after revascularization surgery.

Although a common cause of leg ulcers, arterial insufficiency is a rare cause of hand ulcers. Ischemic ulcers of the hand are mentioned infrequently in the surgical literature and are largely absent from the dermatologic literature. Arterial ulcers are characterized grossly by sharply defined edges with a punched-out appearance at times extending to the deep fascia and tendons.<sup>2</sup> The base of the wound tends to be nongranulating, pale, and necrotic,<sup>3</sup> and histologic features are typically nonspecific. All of these features were present in our patient (Fig 1). The area around the wound may be cool, with diminished or absent pulses, and bilateral blood pressure measurements may be asymmetric.<sup>4</sup> Pain can be striking, as in our patient, and is often described as sharp as opposed to throbbing, burning, and itching with venous ulcers,<sup>5</sup> which are often considered alongside arterial insufficiency.

Peripheral arterial disease alone is generally insufficient to cause or sustain ulceration of the hands.<sup>4</sup> Although arterial insufficiency limits blood flow, it generally is adequate to maintain skin integrity but will be insufficient to support repair after another inciting factor, such as physical trauma.<sup>4</sup> We believe that, in our patient, the minor injury to his right hand in the setting of arterial insufficiency from previous surgical fixation of a clavicle fracture and unrecognized atherosclerotic disease led to poor healing and, ultimately, chronic ulceration.

This case illustrates how strongly dermatologists often rely on distribution or location of lesions as a

morphologic clue to diagnosis. Our patient's ulcers, with their punched-out appearance and a necrotic base, had the morphologic hallmarks of an arterial insufficiency ulcer. Most likely, the correct diagnosis was not initially entertained by multiple providers because of the unusual location and a reassuring initial assessment of unilateral vascular perfusion. Although a radial pulse was present, with no pallor or cyanosis of the hand, greater reliance on the morphology of the lesion itself would have pointed more strongly to the possibility of an arterial ulcer and led providers to compare pulses and systolic blood pressure between the right and left arm. This would have uncovered the right upper limb deficit, leading to a timelier diagnosis. Once diagnosed,

vascular surgery can provide definitive treatment, as shown here.<sup>4</sup>

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