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Visual Diagnosis Pearl

## A Persistent Wound: Differentiating Between Arterial and Venous Ulcers

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A 58-year-old female with underlying type 2 diabetes mellitus (T2DM), hypertension, hyperlipidemia, peripheral artery disease (PAD), coronary artery disease (CAD) status post coronary artery bypass graft (CABG) four months prior, and never tobacco smoker presented with a painful, non-healing ulcer on the left lower extremity for over a month.

The patient's postoperative course was initially unremarkable until two months following her CABG, when a wound developed near the left saphenous vein harvest site. Over the subsequent weeks, she sought emergency department evaluation seven times. She was eventually hospitalized at an outside facility for intravenous vancomycin and cefazolin, followed by a seven-day course of oral linezolid. Despite antibiotic adherence and the application of "medical-grade honey," the ulcer persisted.

Upon initial physical examination, the left lower extremity exhibited a 6 cm dry eschar surrounded by tan granulation tissue and circumferential violaceous discoloration. Serous drainage and residual topical ointment were noted

at the wound margin ([Figure 1](#)). The surrounding subcutaneous tissue was exquisitely tender to palpation. Notably, significant edema and crepitus were absent.

The distal leg and foot were cool to touch, relative to the contralateral side. She noted acute worsening of pain immediately when her leg was gravity dependent despite use of a multimodal pain regimen, which severely limited her mobility. Pain improved with elevation and rest.

Given the patient's severe, out-of-proportion pain, a CT angiogram (CTA) of the abdomen and pelvis with contrast runoff was performed and imaging revealed a 6 mm non-calcified endoluminal plaque versus thrombus in the suprarenal abdominal aorta. Multilevel stenosis involving the right distal popliteal and tibial arteries, as well as the left superficial femoral, popliteal, and anterior tibial arteries was noted.

Vascular surgery recommended conservative wound management, noting the ulcer etiology was likely multifactorial, from venous stasis with a less significant arterial insufficiency component. Medical management of PAD included antiplatelet therapy with aspirin and a high intensity statin. Compression stockings were considered for venous stasis but deferred due to the severity of PAD and the patient's hyperesthesia; leg elevation was recommended instead. Wound care recommended keeping the wound clean and dry with daily application of hypochlorous acid-based cleansing solution. Tighter glycemic control was initiated for uncontrolled T2DM.

### DISCUSSION

Distinguishing between arterial and venous ulcers is critical for directing therapy, though clinical features frequently overlap.<sup>1</sup>

This case highlights the diagnostic challenge of mixed-etiology ulcers. Lower extremity venous, arterial, and mixed ulcers frequently are subject to multiple rounds of antibiotics, often without improvement when accompanied skin changes around the ulcer are misinterpreted as a localized superimposed skin and soft tissue infection.

Mixed type ulcerations can be challenging to treat. Compression therapy is often a mainstay of treatment for venous insufficiency ulcers, and relatively contraindicated in moderate PAD (ABI 0.5–0.8), where only low-pressure compression may be used under close supervision.<sup>2</sup> In this patient, compression was considered but not pursued due to



**Figure 1.** A 6cm dry eschar surrounded by tan granulation tissue and circumferential violaceous discoloration in the left lower extremity.

**Table 1. A comparison between arterial and venous ulcers.**

|                     | <b>Arterial Ulcer (Ischemic)</b>                                                                                              | <b>Venous Ulcer (Stasis)</b>                                                                          |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Location</b>     | Toes, heels, pressure points                                                                                                  | Medial malleolus                                                                                      |
| <b>Appearance</b>   | "Punched out," pale base, dry                                                                                                 | Irregular borders, shallow, exudative                                                                 |
| <b>Pain</b>         | Severe; improved by dependency                                                                                                | Mild to moderate, improved by elevation                                                               |
| <b>Skin Changes</b> | Cool, shiny, hairless, trophic changes                                                                                        | Hyperpigmentation, edema                                                                              |
| <b>Treatment</b>    | Antiplatelet, lipid-lowering therapy, revascularization, smoking cessation, glycemic control, pressure relief, and wound care | Compression therapy, elevation, weight loss, exercise, smoking cessation, wound care, vein procedures |

moderate PAD and intolerance. Ultimately, a multidisciplinary plan addressing both arterial and venous disease was implemented to promote wound healing.



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