

Advancing Tissue Assessment in Wound Care

CASE STUDY

Diabetes mellitus with complications of diabetic foot ulcer & peripheral arterial disease

PATIENT DETAILS

A 64-year-old male patient with a significant past medical history of coronary artery disease of native vessel, varicose veins of bilateral lower extremity with inflammation, secondary lymphedema of venous etiology and diabetes mellitus type 2 (uncontrolled) with complications of peripheral arterial disease (PAD), diabetic foot ulcer, nephropathy and neuropathy.

CASE TIMELINE & DETAILS

The patient was admitted to the Abrazo West Campus to initiate negative pressure wound therapy with instillation and dwell, intravenous antibiotics, surgery consultation and to order non-invasive imaging. Once the imaging was completed, it was evident that the patient had severe peripheral arterial disease (PAD).

9/29/2021: The patient was hospitalized at Abrazo West Campus on secondary to acute worsening of right foot diabetic foot ulcer with abscess.

10/4/2021: Non-invasive radiological imaging - Bilateral lower extremity arterial doppler ultrasound with toe-brachial index: Abnormal bilateral TBI with significant small vessel peripheral arterial disease. (Right TBI 0.26 / Left TBI 0.21)

10/5/2021: CTA of aorta with bilateral lower extremity runoffs - Occlusion of the right posterior tibial artery. Occlusion of left anterior tibial artery with distal reconstitution. Severe diffuse of the left posterior tibial artery. Severe diffuse disease of the right anterior tibial artery.

10/6-7/2021: Cardiology and vascular consultations - Both specialists believed the foot was not salvageable and recommended a right below the knee amputation.

Misael C. Alonso MD, FACP, CWSP

Abrazo West Campus Wound Care Clinic + Abrazo West Campus Hospital

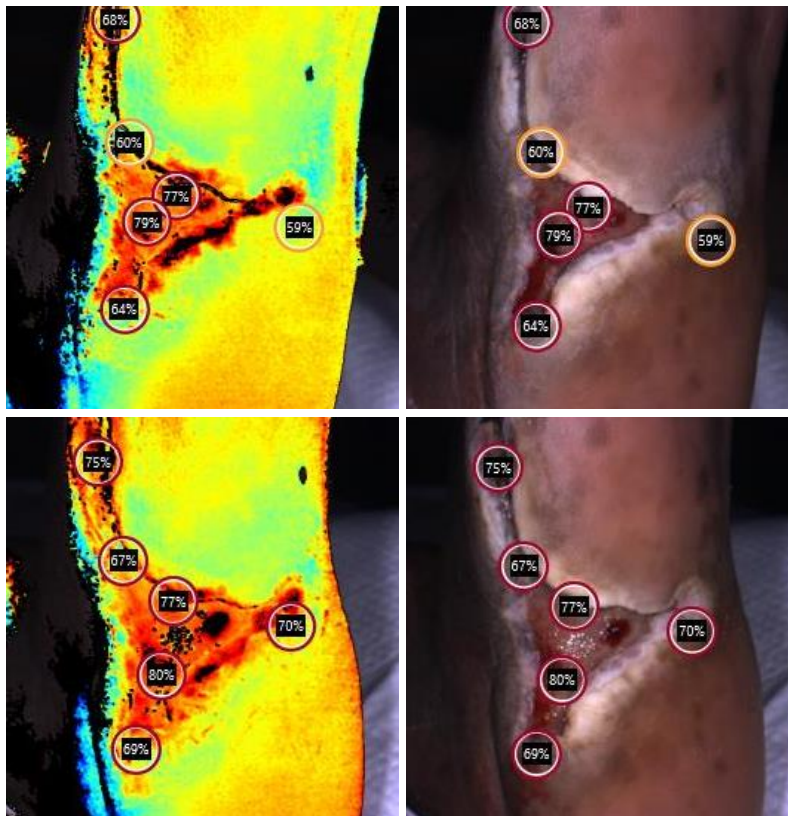


Fig. 1A
01/12/2022 : Pre-HBOT of right foot plantar surface.

Fig. 1B
01/12/2022 : Post-HBOT of right foot plantar surface. Note the increase in oxygenation following the dive.

“Snapshot_{NIR} imaging has been incorporated into my wound care practice and has proven to be an essential tool. It has allowed me to successfully advocate for a patient to continue and complete hyperbaric oxygen therapy. The patient is now healed and is ambulating with both feet.

Misael C. Alonso MD

What are you doing to measure microvascular oxygenation?

Wounds can be deceptive. Leveraging near-infrared spectroscopy (NIRS) for tissue assessment goes beyond the macrovascular to measure the critical microvascular level.

The patient was reluctant to proceed with an amputation and therefore a treatment protocol was designed in a final attempt to save his foot. This treatment protocol included:

- hyperbaric oxygen therapy
- cellular and/or tissue products
- continued negative pressure wound therapy
- offloading with diabetic boot

IMPACT

While in the hospital, the patient began limb salvage therapy with negative pressure wound therapy with instillation and dwell. In addition, the patient underwent routine surgical debridements and intravenous antibiotics. It was felt by the consultants that revascularization would not benefit the patient at this time.

Upon discharge, the patient was followed at the Abrazo West Campus Wound Care Clinic where conventional negative pressure wound therapy was continued with weekly debridements. In addition, the patient started a series of hyperbaric oxygen therapy treatments (HBOT). Following the initial series, HBOT was continued in 10 session increments to achieve wound healing.

On 01/11/2022, the patient completed the initial sessions of hyperbaric therapy with the plan to extend for another 10 sessions. However, the patient's insurance denied any further sessions and requested a peer-to-peer review be done for reconsideration. There was concern from the patient's insurer that the patient was not benefiting from HBOT.

Snapshot_{NIR} S_tO₂ images and documented wound measurements obtained in January were sent for the peer-to-peer review. During the review, the physician was able to see the immediate improvement of oxygenation with HBOT as well as the improvement of the wound size and granulation. As a result, the patient was approved for the additional hyperbaric therapy treatments.

OUTCOME

The patient's wound has completely healed, and the patient is ambulatory with a cane. As the patient also has chronic venous insufficiency with secondary lymphedema, he was referred to the lymphedema clinic for further treatment.

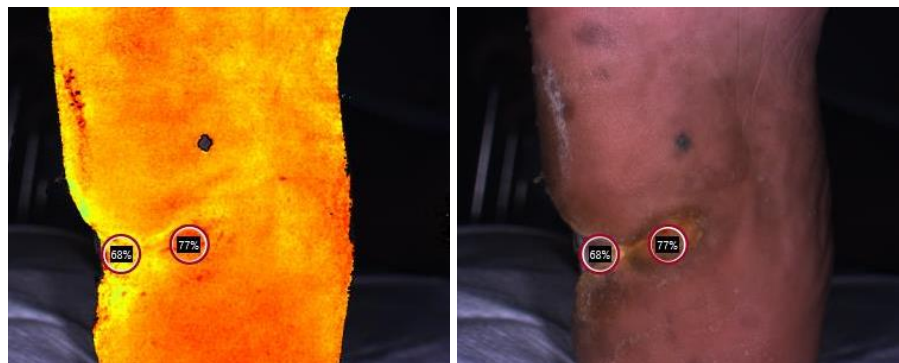


Fig. 2: 02/19/2022: Follow-up, right-foot plantar surface.