

Healing Vs. Non-Healing Hemodynamic Differences in Venous Leg Ulcers

by *Rebecca*

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Venous leg ulcers (VLUs) account for over 90% of all ulcer cases and it is estimated that ~ 1 in 50 people over the age of 80 are affected. Although the standard for clinical assessment is visual inspection, there is a need to develop a physiological approach that differentiates tissue oxygenation in and around the wound region. Herein, the Optical Imaging Laboratory (OIL) developed a portable, non-contact near-infrared optical scanner (NIROS) for sub-surface imaging of wounds. VLUs were imaged using NIROS on a weekly basis at the University of Miami Wound Care Center and Podiatry Care Partners Clinic. The near infrared images were used to evaluate the oxygenated and deoxygenated hemoglobin maps of the wound and the surrounding tissue. The oxygenation hemoglobin contrast between wound and its surroundings differed between healing and non-healing VLU imaged across weeks. For a healing VLU, as the weeks progressed, there was a positive contrast between wound and background and at week 14 the wound region was not distinguishable from the surrounding tissue. This is possibly due to the physiological similarity in the oxygenation content in the wound and normal tissue, as the wound almost healed. In the non-healing case the oxygenation levels were lower at the wound site most of the weeks, possibly causing it to remain at inflammatory stage and not progress towards healing. Systematic hemodynamic analysis of wounds across weeks of treatment can potentially predict healing sooner than visual decrease in wound size, which is the gold-standard approach to assess healing.