

# The Use of Mobile Multispectral Near-Infrared Spectroscopy to Detect Revascularization of the Microcirculation of Individuals with Venous Leg Ulcers post-treatment: A Case Series



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## Introduction

Chronic venous insufficiency (CVI) can lead to complications including venous leg ulcers (VLU). Multispectral near-infrared spectroscopy (NIRS) potentially provides a tool to assess microcirculation as it provides spatial information on the tissue oxygenation (StO<sub>2</sub>). The objective of this study is to investigate the utility of NIRS in detecting the revascularization of the microcirculation in individuals with CVI and venous leg ulcers after receiving an invasive treatment.

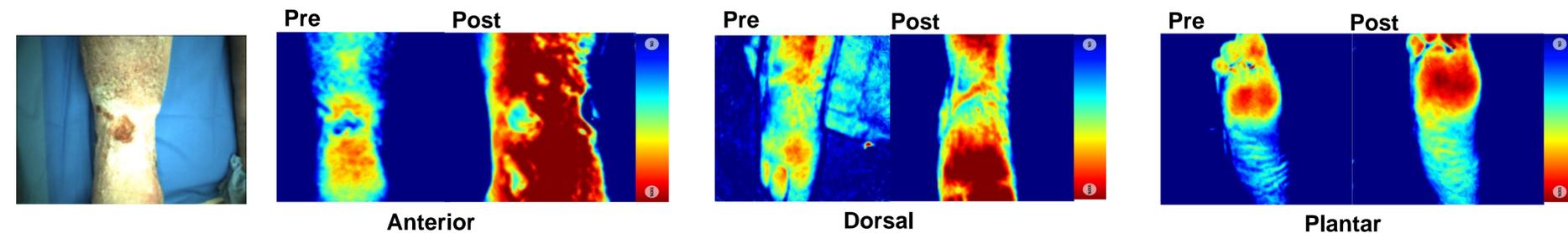
## Methods

This study observed patients undergoing an invasive procedure to treat their CVI and VLU. Multi spectral NIRS images of the lower extremity were collected prior to intervention, and afterwards. An FDA-cleared handheld mobile multispectral NIRS device<sup>1</sup> was used to measure temperature and StO<sub>2</sub>. Individuals with CVI leading to stasis ulcers were selected for this case series. Images were acquired from multiple anatomic locations including the foot (dorsum and plantar), medial and lateral leg, and proximal leg. Demographic, medical history, arterial and venous studies performed prior to procedure are reported.

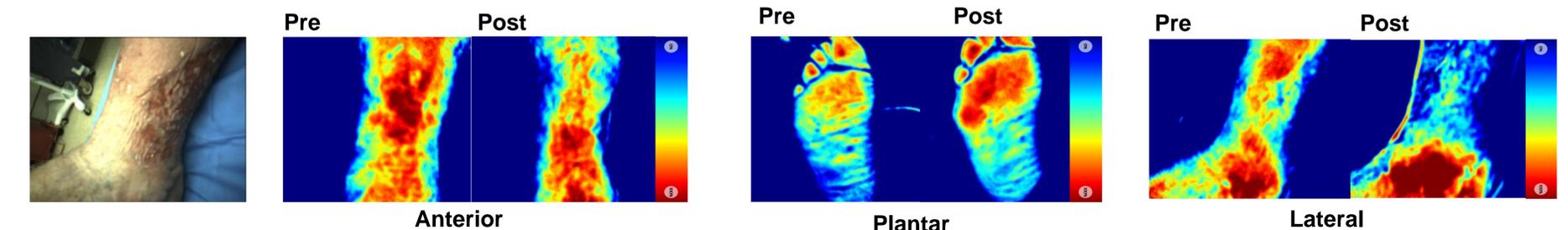


## Results

**Case 1:** 69-year-old man with DMII, PAD, and a smoking history diagnosed with CVI with significant reflux of the right great saphenous vein (GSV). The patient had a radiofrequency ablation treatment with significant changes in StO<sub>2</sub> in multiple views. The anterior leg showed a 56% increase, an 80% increase in the dorsal foot, a 17% increase in the plantar foot, and 25% increase in the heel.



**Case 2:** 60-year-old man with HTN, DMII, and prostate cancer with nonhealing VLU for 7 months. He is diagnosed with CVI with significant reflux of the right GSV. The patient had sclerotherapy treatment using polidocanol microfoam<sup>2</sup> in the GSV with significant changes in StO<sub>2</sub> in multiple views. The medial leg showed an increase of StO<sub>2</sub> between 15% and 46%, a 18% increase in the anterior leg, a 24% increase in the plantar midfoot and 36% increase in the lateral leg.



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## Conclusion

It is unknown whether superficial venous intervention will demonstrate successful intervention or require further subsequent interventions. Changes in StO<sub>2</sub> and temperature can be quantified pre and post intervention using multispectral NIRS. Measuring spatial StO<sub>2</sub> in the use of a mobile NIRS device demonstrates promising ability to detect early microcirculation changes post VLU intervention by viewing different orientations of the foot and leg.