

Introduction

Diabetic foot ulcers (DFUs) stand as a leading cause of hospitalizations, amputations, and diminished quality of life among individuals with diabetes. Additionally, they significantly contribute to the financial burden on healthcare systems (Armstrong et al., 2020). The primary goal in managing DFUs is to avert severe complications (Chen et al., 2023). Various treatment approaches are employed to expedite DFU healing, including hyperbaric oxygen therapy (HBOT), which has demonstrated effectiveness in addressing non-healing wounds. Nonetheless, there exists variability in its application and resulting outcomes. Debridement, another common practice, is regularly employed to hasten the healing process.

Methods

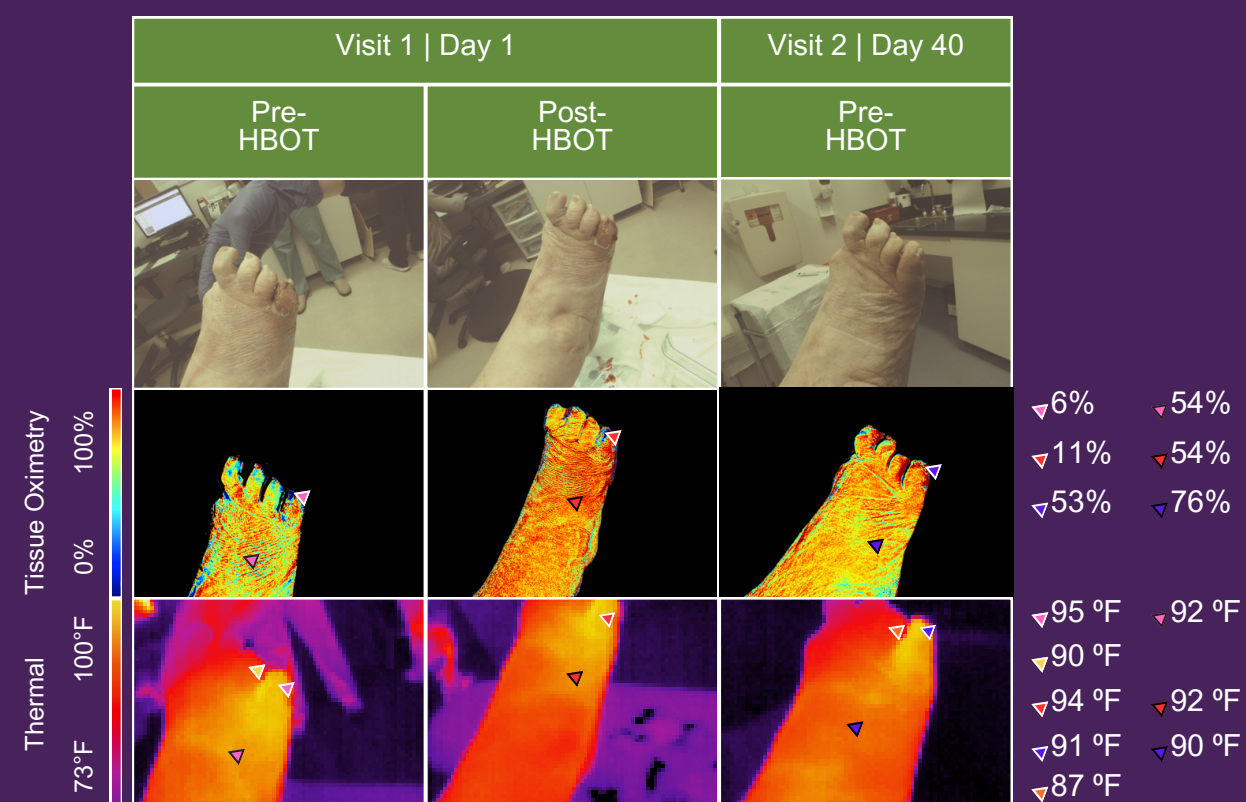
Utilizing a handheld near-infrared spectroscopy (NIRS) and thermal imaging device (MIMOSA Pro, MIMOSA Diagnostics Inc., Toronto, Canada), this study assessed integration of tissue oxygenation levels and skin surface temperature measurements into the DFU management workflow.

Discussion & Conclusion

This study explores the incorporation of mobile NIRS imaging as an advanced technique for assessing the healing progress of hard-to-heal DFUs. The imaging device used in this study has shown the ability to produce immediate images, offering valuable insights into tissue perfusion and temperature. This DFU management advancement not only facilitates a comprehensive understanding of wound healing trajectory but also offers real-time feedback to guide immediate interventions, track and document medical necessity, and therapeutic efficacy.

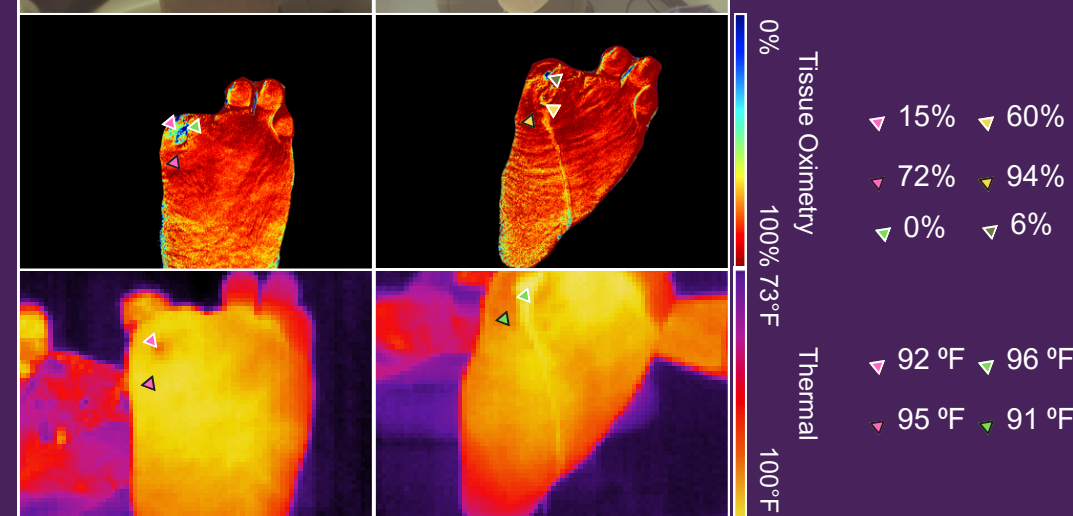
- **HBOT:** helps to document therapeutic efficacy, aids in patient compliance by demonstrating improvements to tissue health following each set of dives.
- **Debridement:** helps to focus on wound bed preparation and guide how much tissue to debride.

Patient 1 - a 72-year-old female with a chronic Wagner Grade 1 DFU persisting since March 12th, 2024. In addition to standard wound care, treatments have involved packing tape application and debridement procedures. The patient is on a healing trajectory with a 20% reduction in wound area observed since the initiation of imaging.



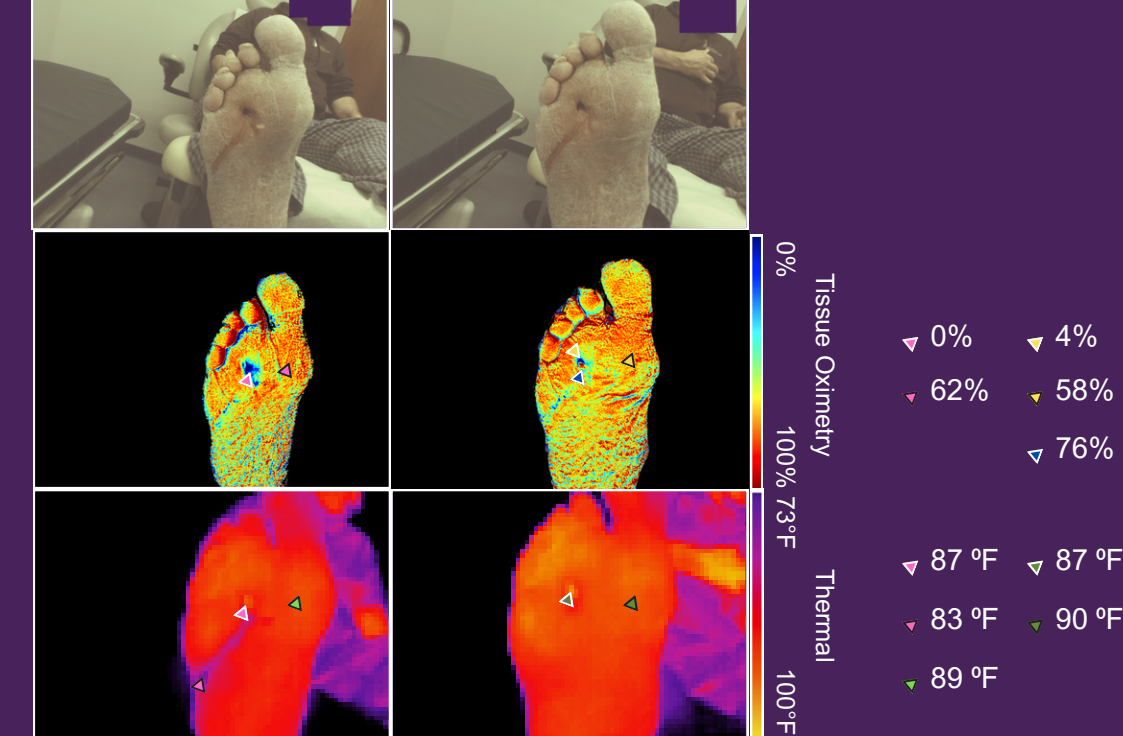
NIRS imaging real-time feedback offers valuable insight to the wound care provider regarding the efficacy of the HBOT treatment supporting the use of advanced treatment.

Patient 2 - a 47-year-old male with a chronic Wagner Grade 1 Diabetic pressure ulcer persisting since April 5th, 2023. In addition to standard wound care, treatments have involved total contact casting (TCC) and debridement procedures. The patient is on a healing trajectory with 56% reduction in wound area observed over two weeks.



NIRS imaging offers valuable insight to the wound care provider regarding the efficacy of the debridement and underscores the healing capacity of the wound.

Patient 3 - a 68-year-old male with a diabetic pressure ulcer persisting since August 2nd, 2023. In addition to standard wound care, treatments have involved total TCC, the application of skin substitutes and debridement procedures.



NIRS imaging offers valuable insight to the wound care provider regarding the efficacy of the treatment supporting the use of advanced treatment, such as skin substitutes.

