

Keyur Patel DO ¹, Bryan Doner DO ¹, Laura Serena MEd LPN ^{1,2},
Heather Connell CCRP ^{1,2}, Thomas Serena MD ^{1,2}

¹The Wound Healing & Hyperbaric Center, ACMH - Kittanning, PA ²SerenaGroup - Cambridge MA

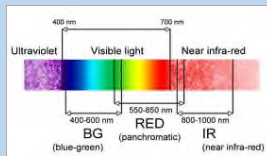
Introduction

Indocyanine Green Fluorescence angiography (ICGA) assesses perfusion at the microvascular level. It has become an essential tool in the operating theater reducing post-operative complications in coronary artery bypass grafting, plastic and reconstructive surgery, abdominal wall component separation, colorectal and other surgical procedures. The use of ICGA can be expanded beyond the operating room to the wound care center. The Fluorescence Angiography system* evaluates perfusion in lower extremity wounds, such as diabetic foot ulcers.

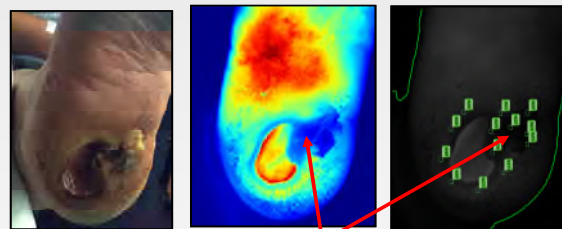
Methods

Five patients with Wagner III diabetic foot ulcers under consideration for hyperbaric oxygen therapy (HBOT) underwent evaluation of perfusion to the foot using ICGA in which 2.5ml of indocyanine green followed by 10ml flush of saline was injected through an intravenous line through a peripheral vein. The fluorescence is noted on the monitor 10 to 20 seconds after injection. The foot is imaged using the system over the next five minutes and perfusion percentages are measured. It is important to note that the machine operates on the principles of near infrared light therefore ambient light may affect the quality of the image.

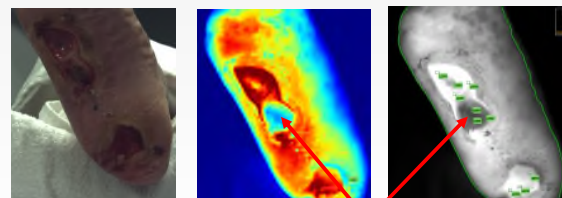
The machine operates on the principles of near infrared light therefore ambient light may affect the quality of the images.



Areas of poor perfusion indicates the need for debridement



Areas of poor perfusion



Central area of poor perfusion

Results

The fluorescence angiography system permitted the wound care physician to evaluate the perfusion to the angiosome in which the wound is located. The procedures were performed in the wound clinic without adverse events. The five patients had adequate flow. They were deemed to be appropriate candidates for HBOT. The investigators observed that in the majority of the patients there were areas in the periwound that did not have adequate perfusion indicating non-viable tissue was present. These areas were then excised sharply. All of the wounds improved with a reduction in wound surface area over four week follow-up period as followed by the ARANZ[®] camera system.

Conclusions

Fluorescence angiography measures skin perfusion. It can be used to guide debridement of diabetic foot ulcers.

*LUNA[®] - Novadaq

Acknowledgements

SerenaGroup[®] case series program.

