CASE STUDY

Snapshot O_2t NIR

Diabetic Foot Ulcer with Surgical Debridement and NPWT Placement

Presented by: Ronald Ray, DPM, FACFAS, WCC, PT

CASE DETAILS:

The patient presented with a Grade IV necrotic wound lateral aspect of the 5th metatarsal head of the left foot. He had non-palpable popliteal, dorsalis pedis and posterior tibial pulses and refill to the left foot was 3-4 seconds. He had an absent protective threshold, sharp/dull and light touch in both lower legs and feet. Radiographs of the left foot revealed lucency and lytic changes within the fifth metatarsal head. MRI was performed revealing increased signal in the fifth metatarsal head on T2 weighted images and decreased signal on T1 weighted images consistent with osteomyelitis.

Fig 1. Baseline clinical images of the lateral surface of the left foot with a grade-IV ulceration.

Fig 2. Medial oblique radiograph demonstrating diffuse osteopenia of the fifth metatarsal head with distal lytic changes consistent with osteomyelitis.

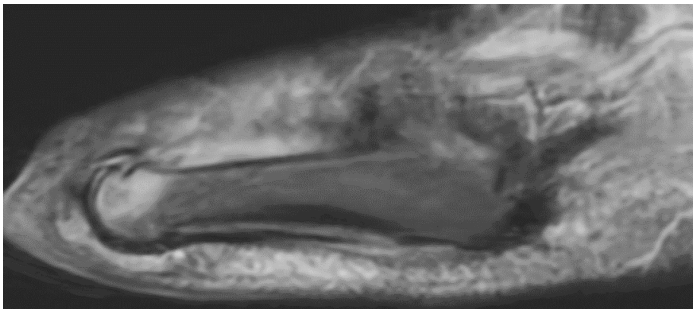

Fig 3. Sagittal reconstruction, T2 weighted MRI image of the left foot showing increased signal intensity within the distal portion of the fifth metatarsal neck and head consistent with osteomyelitis.

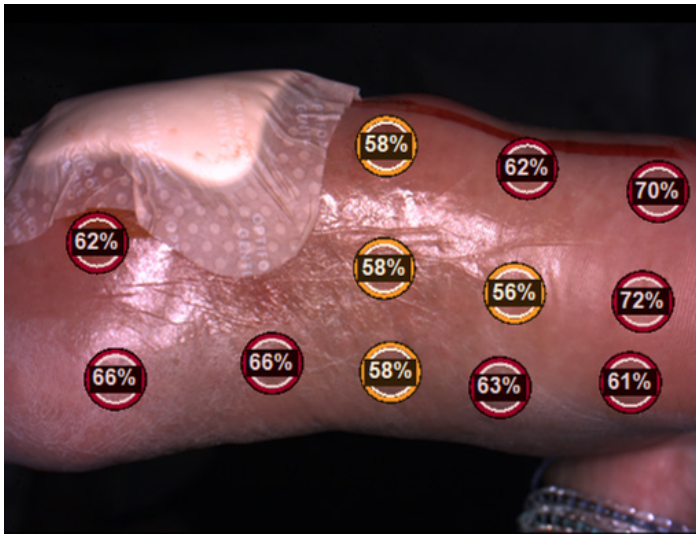

Fig 4A. Clinical image of the plantar surface of the left foot pre-surgical debridement.

Examination raised concern for osteomyelitis. X-ray and MRI studies showed degrative bone changes of the distal 5th metatarsal. SnapshotNIR images were taken to assess the tissue perfusion and oxygen saturation (S_tO_2) of the wound and peri-wound region. The S_tO_2 values on the plantar aspect of the foot ranged from high 50s to mid-70s. The S_tO_2 values on the lateral side of the foot ranged from mid-60s to 80s.

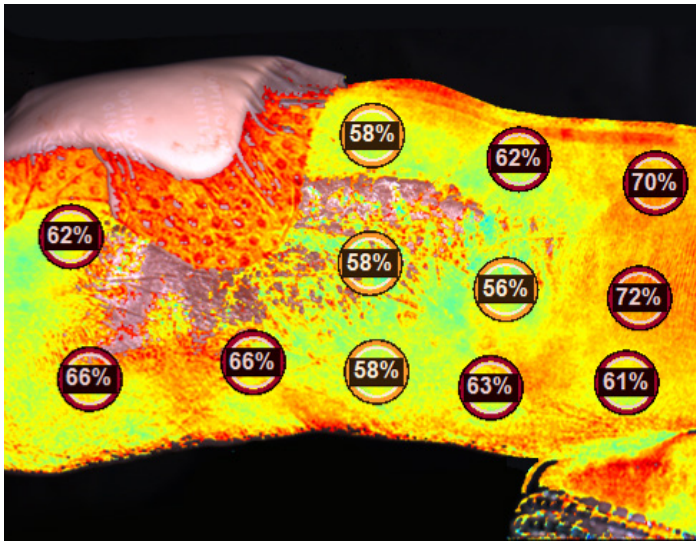

Fig 4B. S_tO_2 image of the plantar surface of the left foot pre-surgical debridement.

The tissue oxygen saturation values indicated adequate perfusion and oxygenation of the tissue and the decision was made to manage with surgical debridement and negative pressure wound therapy (NPWT). Following the NPWT treatment, granulation tissue was achieved over the entire wound bed and the patient healed.

IMPACT:
SnapshotNIR images were utilized to assess the patient's ability to tolerate a surgical debridement. The NIRS images showed that the area around the wound, as well as the plantar aspect of the foot, were adequately oxygenated. This indicated that the patient would likely respond well to the treatment plan.

"SnapshotNIR provides both an immediate assessment of the S_tO_2 of a given area and a level of predictability about how a wound will likely heal when deciding on different treatment options. When considering an amputation for a patient, low S_tO_2 values suggest poor healing capabilities for that area. Therefore, alternative treatment options should be pursued and more aggressive treatments should be postponed until the poor S_tO_2 levels have been addressed."

-Ron Ray, DPM

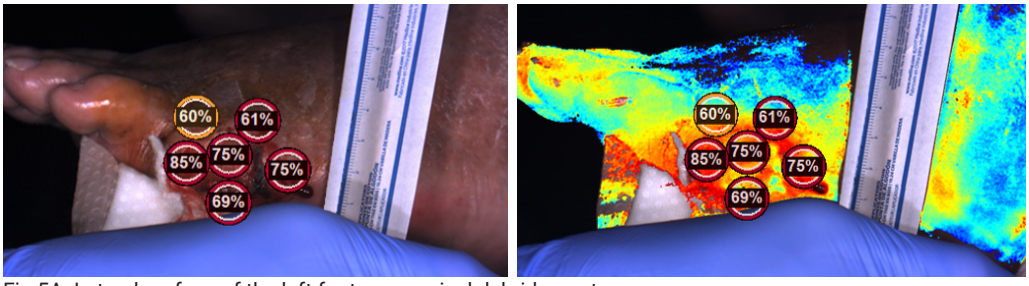

Fig 5A. Lateral surface of the left foot pre-surgical debridement.

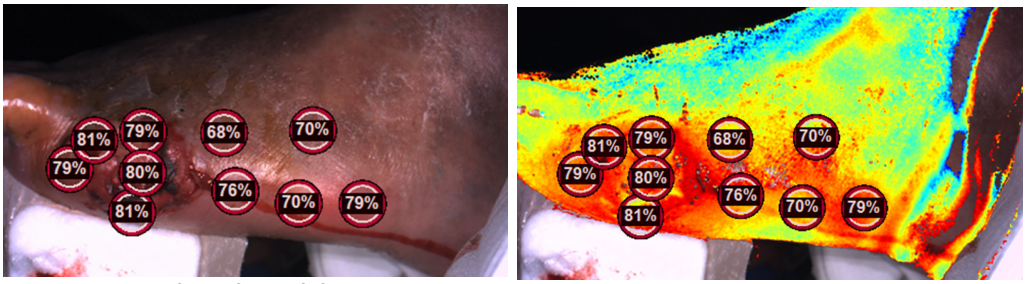

Fig 5B. Lateral surface of the left foot post-surgical debridement. Note the increase in oxygenation.

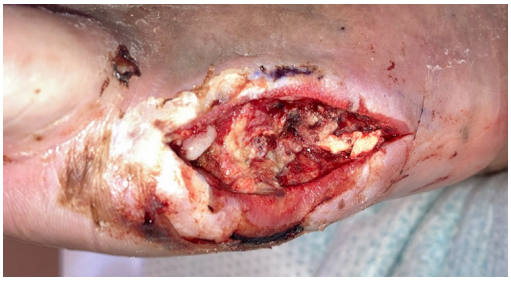
Fig 6. Image of foot post-debridement and pre-NPWT.

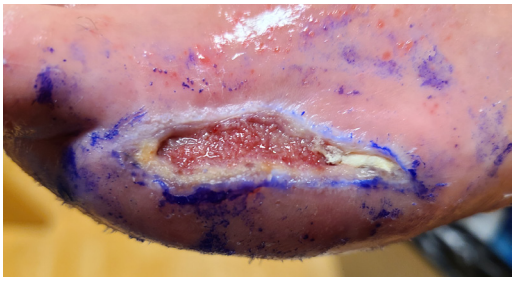
Fig 7. Image of left foot post-NPWT replacement.

Ron Ray, DPM

Dr. Ray is a Podiatrist at the Benefis Foot and Ankle Clinic in Great Falls, Montana. His expertise is in Ankle and Foot reconstructive surgery and management of chronic non-healing wounds. He is Past-President of the Montana Podiatric Medical Association and current Chair of the Surgical Skills Committee, American College of Foot and Ankle Surgeons.

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