CASE STUDY Scarborough & Rouge Hospital – Toronto, ON, Canada

Detect and Treat *Pseudomonas Aeruginosa* Based on Cyan Fluorescence using MolecuLight ***i:X***®

Pseudomonas aeruginosa is a significant contributor to hospital acquired infections where delay of targeted treatment, including antimicrobial therapies, is associated with increased morbidity and mortality[1].

Unlike porphyrin-producing bacteria which emit red fluorescence under violet light illumination[2], cyan fluorescence indicates the presence of *Pseudomonas aeruginosa* (>10^4 CFU/g).

In this case study, the clinician used MolecuLight ***i:X*** to confirm the presence and location of cyan fluorescence (indicating *Pseudomonas aeruginosa*) in a venous leg ulcer. As seen in Figure 3, the cyan color (with a glowing white center) suggests the presence of *Pseudomonas aeruginosa* at loads of >10^4 CFU/g,[2] which would otherwise be invisible to the unaided eye. The clinician used this information to guide debridement of the wound to these areas of cyan fluorescence, and subsequently re-imaged the wound after debridement to assess effectiveness of the procedure. Figure 4 indicates a reduction in the overall cyan fluorescence in the wound post-debridement, but not a complete eradication.

The MolecuLight ***i:X*** images (Figure 4) provided important evidence that *Pseudomonas aeruginosa* (based on cyan fluorescence) was still present after debridement. This information helped the clinician make the decision, at the point of care, to select an antimicrobial (silver) cream, and larger silver dressings to fully manage the remaining bacterial load. This example shows how the MolecuLight ***i:X*** can increase the likelihood of identifying wounds with elevated bacterial loads (>10^4 CFU/g) compared to clinical signs and symptoms alone and provide information to target debridement and treat wounds more effectively, compared to the standard of care[3,4].

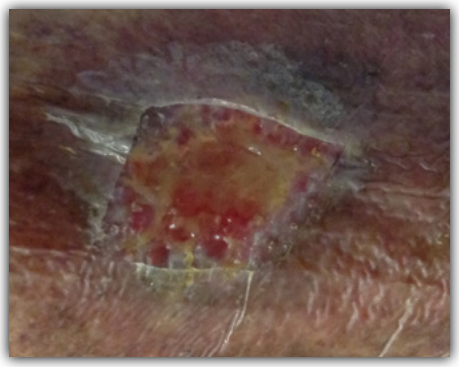

Figure 1: Standard Image. Venous leg ulcer pre-debridement.

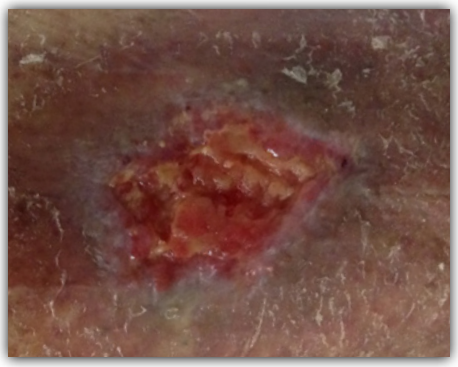

Figure 2: Standard Image. Venous leg ulcer post-debridement.

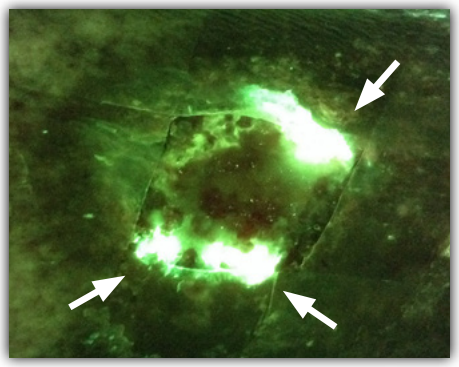

Figure 3: Fluorescence Image. Venous leg ulcer pre-debridement. Cyan/white regions indicate *Pseudomonas aeruginosa* (>10^4 CFU/g).

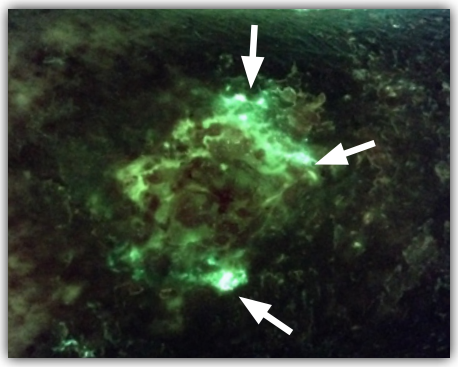

Figure 4: Fluorescence Image. Venous leg ulcer post-debridement. A decrease in cyan/white fluorescence suggests a decrease but not an eradication of *Pseudomonas aeruginosa* (>10^4 CFU/g).

Practitioner

Rose Raizman RN-EC, MSc, with over 19 years of experience, leads the Save Our Skin (SOS) team at Scarborough & Rouge Hospital located in Toronto, Canada, to combat pressure ulcers of hospital inpatients. She also oversees the wound care clinic for inpatients and outpatients.

Patient Condition

78-year-old female patient with a venous leg ulcer received local wound care and negative pressure wound therapy. Against the clinician's orders, home care nurses stopped using a prescribed antimicrobial paste. After fluorescence imaging of the wound, the clinician added larger silver dressings and antimicrobial cream to the patient's treatment.

MolecuLight®

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MolecuLight *i:X*®

The MolecuLight ***i:X*** allows clinicians to quickly, safely and easily identify wounds with bacteria[2-5] (at loads of >10^4 CFU/g, in combination with CSS) and measure wounds[3,5] at the point of care to provide them with valuable information to inform treatment and monitor progress[4,5].

Testimonial

"I suspected colonization, and MolecuLight ***i:X*** guided me to efficiently target debridement and topical therapy application to ensure maximum removal of the bacterial load and prevent further contamination."

— Rose Raizman RN-EC, MSc

Cyan/white color in this image indicates bacteria (>10^4 CFU/g)[2,3].

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References:
Images provided by Rose Raizman, RN-EC, MSc, Scarborough & Rouge Hospital, ON, Canada
MolecuLight Clinical Case 0048.

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2. Rennie MY *et al.* Understanding Real-Time Fluorescence Signals from Bacteria and Wound Tissues Observed with the MolecuLight ***i:X***. Diagnostics (2019).
3. Raizman R *et al.* Use of a bacterial fluorescence imaging device: wound measurement, bacterial detection and targeted debridement. J Wound Care (2019).
4. DaCosta RS *et al.* Point-of-care autofluorescence imaging for real-time sampling and treatment guidance of bioburden in chronic wounds: first-in-human results. PLoS One (2015).
5. Cole W & Coe S. The Use of an Advanced Fluorescence Imaging System to Target Wound Debridement, Decrease Bioburden, Improve Healing Rates, and Provide Positive Revenues in an Outpatient Wound Care Setting. Presented at SAWC Fall 2019 (Las Vegas, NV, USA).

The MolecuLight® ***i:X*** Imaging Device is approved by Health Canada for sale in Canada and has CE marking for sale in the European Union. The MolecuLight® ***i:X*** Imaging Device has received FDA clearance.