



# SOURCE CONTROL OF BACTERIA IN WOUND-ASSOCIATED CELLULITIS PREVENTS PROGRESSIVE CELLULITIS, COMPLICATIONS AND THE OVERUSE OF ANTIBIOTICS

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## Introduction

Cellulitis, a prevalent bacterial skin infection, affects millions of individuals annually, and represents significant healthcare costs. Failure to identify the source of bacteria leading to wound-related cellulitis can lead to recurrent episodes, unnecessary prolonged discomfort, predisposition to complications, and therefore unnecessarily costly treatments.

Effective identification and targeting of the source via debridement and local wound care enables and potentiates the function of systemic antibiotics, shortening healing times and avoiding complications. Here, we present a case of refractory cellulitis in a high-risk patient that highlights the need for effective bacterial source control as well as cellulitis management.

## Clinical Case

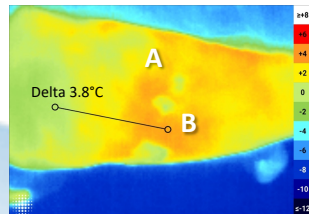
64 y/o old male (pre-diabetes, obese, status post left BKA after a motorcycle accident and chronic stasis dermatitis) with traumatic non-healing painful, malodorous, exudative wounds of 2 months duration. Initially treated in the ED with oral Cephalexin and Doxycycline with initial improvement followed by a return of cellulitis.

Upon return to ED, a loading dose of Vancomycin plus Augmentin and Doxycycline is prescribed but symptoms persisted. Upon referral to our specialized wound care clinic, signs indicative of cellulitis were detected. Examination of the wounds suggested that they were inadequately evaluated and treated. The addition of fluorescence imaging, and thermal imaging indicated the source of bacteria. Wound A was identified over wound B as the bacterial source of persistent cellulitis.

## Take Home Points

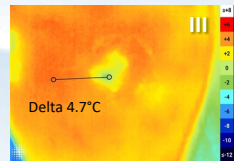
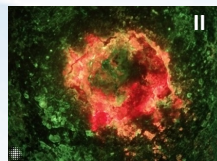
- Systemic treatment of cellulitis without effective management of the source is futile
- New technologies enable the identification of the source objectively and serve to follow the wounds prospectively to determine if therapeutic modifications are needed
- This approach supports a more cost-effective treatment that benefits the patients, the providers and the system, potentially decreasing the incidence of chronic recurrent cellulitis.

### 1<sup>st</sup> Visit

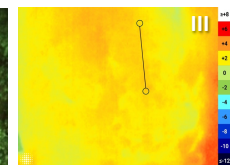
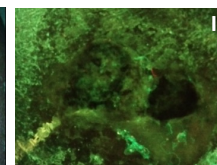


Fluorescence-guided debridement was done & local antimicrobials (Blastix, Hydrophera Blue) applied to allow systemic antibiotics to take effect.

(L) Signs and symptoms-based clinical assessment alone is not enough to establish the source of the infection between wounds A or B. (R) From a distance, thermal imaging shows a widespread increase in temperature around the wounds



**Wound A:** I. Standard Image II. Fluorescence Image (red bacterial fluorescence detected) III. Thermal Imaging shows significantly warmer temperatures in the surrounding tissues



**Wound B:** I. Standard Image II. Fluorescence Image negative for bacteria III. Thermal Imaging showing homogeneous temperature distribution



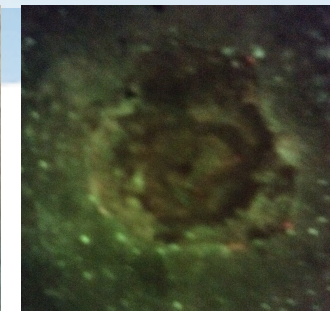
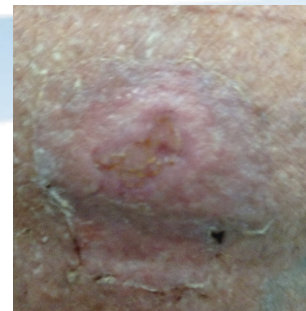
Post-debridement standard (top) and Fluorescence negative (bottom) images.



Microbiology taken at first visit confirmed 3 days later presence of *Streptococcus Pyogenes* and *Peptoniphilus Asaccharolyticus* on wound A, and negativity for wound B.

### 2<sup>nd</sup> Visit (1 week later)

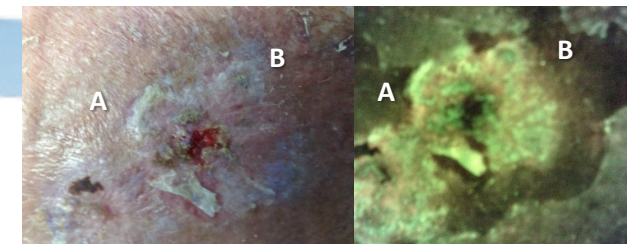
Significant clinical improvement is observed with combined local and systemic treatment. Following the completion of oral antibiotics, topical treatment is continued based on the findings. Fluorescence imaging is negative for both wounds on this occasion, and no obvious signs of infection noted clinically.



Wound A: Standard (L) and Fluorescence (R) negative images during second visit.

### Final Visit (2 weeks after initial visit)

The cellulitis has resolved, and the wounds are progressing towards healing. The patient is discharged from our specialized wound care clinic after just 3 weeks of treatment. Fluorescence imaging continues to be negative.



Standard (L) and Fluorescence (R) images of both wounds. No evident signs of cellulitis. Wounds are almost healed. Fluorescence is minimal and easily removed with standard wound cleansing. Patient is discharged with topical care indications.