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Easier Microbiological Identification in Wound Infection Through Needle Aspiration Guided by Fluorescence: a Pilot Study of Accuracy



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BACKGROUND

Wound infection is the invasion and multiplication of microorganisms in tissues, resulting in cellular damage. For the etiological diagnosis, swab collection does not necessarily represent the microbiological agent. For wound infection, quantitative or qualitative biopsy, curettage, or needle puncture can be performed. The diagnosis of wound infection remains a challenge and has been a topic of interest in world literature for the last thirty years.

METHODS

Report a case series as a pilot study of the accuracy of DNAC.

RESULTS

Eight patients with chronic wounds underwent DNAC and QCB. Microbial load was assessed using a MolecuLight i:X[®] fluorescence camera emitting violet light to detect bacterial fluorescence. A 100-LED 395 nm violet UV flashlight was also tested to evaluate agreement between devices.

Patient characteristics:

- 4 male (50%), 4 female (50%)
- Age: 46–78 years (mean 65; SD 12)
- 87.5% venous insufficiency
- 75% arterial hypertension
- 62.5% diabetes
- 25% bone infection
- 12.5% positive Probe-to-Bone
- 12.5% paraplegia

Among the eight patients:

- 3 negative cultures
- 5 positive cultures
- Isolated microorganisms:
- Staphylococcus aureus (1)
- Enterobacter cloacae
- Serratia marcescens
- Pseudomonas aeruginosa
- Proteus spp.

AIM

Pilot study to demonstrate Dermal Needle Aspiration Culture (DNAC) and Quantitative Culture Biopsy (QCB) as methods for wound infection.

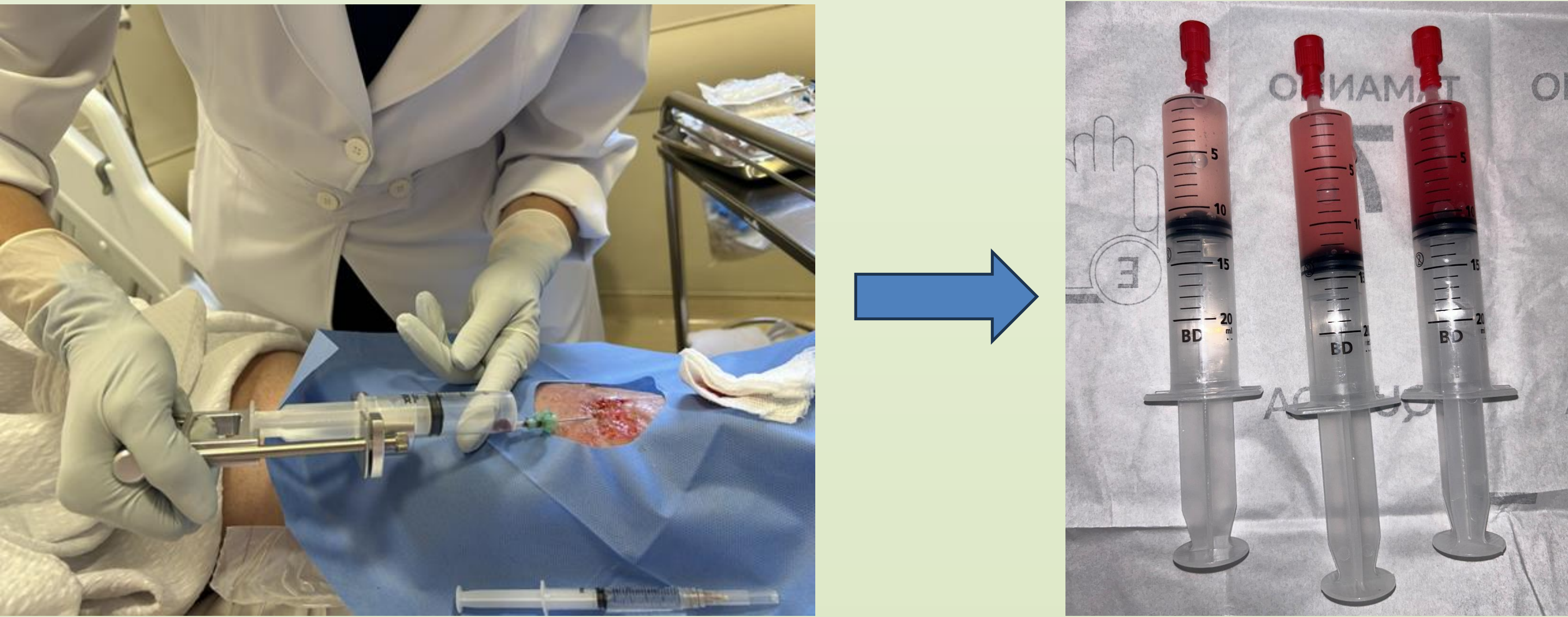


Figure 1. Wound management strategy for DNA culture and the material collected. Source: image bank of the researchers' wound management strategy.

CONCLUSIONS

DNAC may have high sensitivity and specificity. It is possible to find the agreement between two fluorescence light devices in the assessment of infected complex wounds. In the positive fluorescence, QCB is necessary when no sign of infection is present.

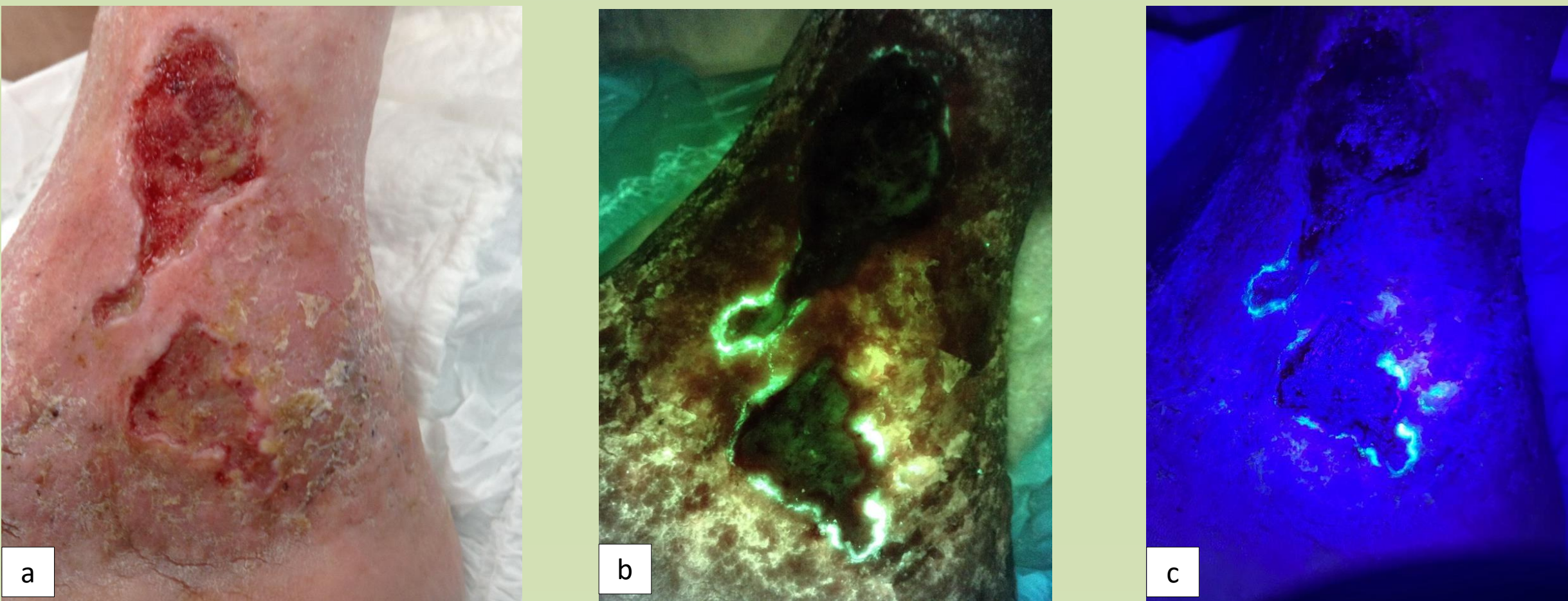


Figure 2. Wound on the left lateral malleolus of a diabetic foot with autofluorescence with positive culture with Pseudomonas aeruginosa 10⁴ CFU/g of tissue. Source: image bank of the researchers' wound management strategy.

Legend:
a) picture of the wound for anatomical reference (left lateral malleolus).
b) autofluorescence detected using MolecuLight i:X.
c) autofluorescence detected using a standard lamp with a 12-megapixel camera.
Note that the areas of fluorescence detected are overlapping.

