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(CASE REPORT)

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The use of p-toluenesulfonic acid (PTSA) to eradicade the biofilm in chronic arterial ulcer.

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Abstract

An arterial ulcer is an ulcer due to inadequate blood supply to the affected area (ischaemia). Arterial ulcers tend to occur on the lower legs and feet, and may be acute, recurrent or chronic. An arterial ulcer is also known as an ischemic ulcer.[1][2][3]

Biofilms complicate wound care by causing recurrent infections that are often resistant to debridement and are highly antibiotic-tolerant. Microorganisms living within a biofilm are up to 1,000 times more antibiotic-resistant than their planktonic forms and amplifies the need for therapeutic modalities to tackle biofilms, especially those associated with wounds.[4]

A major concept that has emerged is the need, in chronic ulcers, for strong initial combination treatment (i.e., the most effective debridement technique in conjunction with the most effective anti-biofilm treatment) to rapidly and effectively reduce biofilm levels within wounds, and subsequently reduce inflammation, reactive oxygen species, and protease activities. [5][6]

P-toluensolfonic acid desiccates the biofilm both residing and planktonic microorganisms in the wound bed within 10 seconds.[7][8]

The process involves cleaning the wound, applying p-toluensolphonic acid for 10 seconds, rinsing with saline, and dressing the wound as per standard care.

P-toluensolfonic acidworks by desiccating the wound bed removing moisture from biofilm and pathogens, which effectively halts infection and inflammation. This creates an optimal environment for healing to resume.[9]

Keywords: Biofilm; P-toluenesulfonic Acid; PTSA; Chronic Wound Care; Chronic Artherial Wound; Chemical Debridement

1. Introduction

Our body can heal arterial wounds on its own, The natural healing process will be significantly slower due to circulation issues. Many people with arterial ulcers experience chronic pain and sores that take months or years to fully heal. Treatment for arterial ulcers will depend on the severity of the arterial disease. Diagnostic tests have to be conducted to assess possible forms of treatment, as well as the potential for woud healing.[10][11]

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The literature suggests that biofilms are difficult to treat and remove. This is due to the protective state the biofilm adopts attributable to quorum sensing, which induces changes inthe bacterial gene expression that aims to promote survival of the microorganism (Phillis). Debridement cannot completely eradicate biofilms from the wound bed and it can reform relatively quickly.[12][13]

2. Methods

P-toluenesulfonic acid (C-DEB) on a weekly basis until granulation tissue (week 8); HYA and silver spay weekly, Fitostimoline (phenoxyethanol and triticum vulgatis) and standard medication. The outcome was 100% granulation tissue. WBP: ultrasonic and dermal curette.

2.1. Clinic

Patient: male 93 years old with arterial ulcera at third distal of the right leg.

The patient underwent to tromboembolectomy of popliteal artery, anterior and posterior tibial artery, fibular artery and popliteal thromboendarterectomy (TEA) with bovine pericardium with success.

Figure 1 Eschar on the wound: dry, black, firm, and firmly adhering to the wound bed

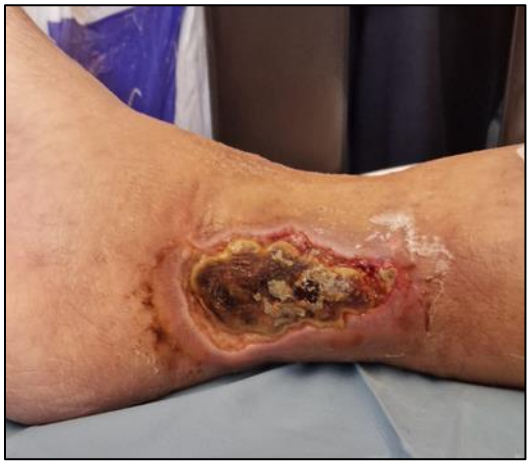

Figure 2 1 week after hydrocolloid advanced medication

a

b

a P-tolensulfonic acid (C-DEB) application; **b** After 10” p-tolensulfonic acid application and ultrasonic WBP

Figure 3 Week 2

After 10” p-tolensulfonic acid application and ultrasonic WBP

Figure 4 Week 4

Figure 5 Week 8 - Good granulation

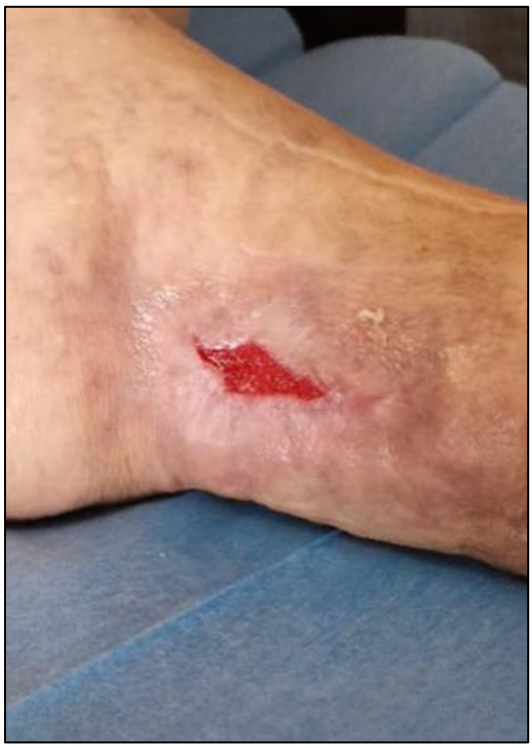

Figure 6 Week 12

Figure 7 Week 14

Figure 8 Week 17 - Healing

3. Conclusion

P-toluensulfonic acid reports a remarkable anti-biofilm effect and promote healing. Dissecating agent treatment appears to restart the healing process of chronic ulcers.

Compliance with ethical standards

Acknowledgments

The Authors acknowledge the p-toluensulfonic acid Italian producer for providing the material for the case described.

Disclosure of conflict of interest

The Authors have no actual or potential conflict of interest in relation to this paper.

Statement of informed consent

Patient's informed consent was obtained.

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