

Wireless Micro Current Stimulation Promotes Healing Process of Chronic Diabetic Leg Ulcer

A Case Report

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Summary	In this case report, a patient with chronic wound have showed a significant result in wound healing process, after receiving electrical stimulation using the most advanced Wireless Micro Current Stimulation technology. A 70 years old male patient with chronic diabetic leg ulcer, which is hard to heal, have completely healed after 45 treatments using WMCS combined with standard wound care. This result convincingly proves the major role of WMCS in the treatment of chronic wound, especially the one that is difficult to heal.
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Introduction

The term “current of injury” referred to the biological endogenous electrical current between the skin and deeper layers, when there is a disruption of the epithelial barriers.¹ This current occurs mainly due to the connection of the negative charge on the surface layer and the positive charge in the inner tissues², which is happened after wounding. The current of injury will continue to flow until the skin damage is completely repaired³. In chronic wound the electrical current stops, therefore the healing process is halted.⁴ The transfer of electrical current through electrical stimulation into refractory wounds mimics the biological “current of injury”, and this will eventually restart the healing process.⁵

Wireless Micro Current Stimulation (WMCS) Technology

WMCS technology (Wetling EU Aps, Denmark) provides an electrical stimulation with the most advanced way, using wireless as the transmission method. WMCS device uses charged oxygen ions to supply the electrical current towards the

wounded tissue. To complete the circuit, a neutral electrode is applied at the wrist of the patient, and this also useful to make a measurement of the numbers of electron that has been transferred. Electrical stimulation using Wireless Micro Current Stimulation technology provides a great modality for wound treatment, which will promote a faster wound healing process without any pain and additional risk of infection. The treatment is also easy to administrate, with no need to be worried about the size of the wound, since WMCS can cover an area up to 400 cm².

Patients and Methods

This study has been held from April 2012 until now, and the patient is receiving wound care treatment using Wireless Micro Current Stimulation along with standard wound care, at Wound Medical Care Specialist Clinic, Jakarta, Indonesia. Wounds are cleaned with normal saline, and necrotomy procedure is conducted depends on the necessity. Each WMCS treatment occurs for an hour, and the wounded tissue is then dressed using hydrocollid based wound care product.

A 70 years old male presented with a hard-to-heal chronic diabetic ulcer, at the lower leg. His right leg has been amputated a year ago at the ankle level, due to unhealed diabetic ulcer that has reached the bone, causing osteomyelitis. After the amputation, the ulcer was still unhealed, and the wound size was getting big, even though the patient has a good blood sugar level, well-controlled diet and stable blood pressure. He was undergone treatment using WMCS, each session is using 1.5 μ A current for an hour. After 45 series of treatment, the wound is completely healed, and now the patient is relieved. These are series of documentation, showing a significant improvement of the patient's ulcer while being treated with Wireless Micro Current Stimulation.



Fig 1. First day of admission



Fig 2. After 5 treatments using WMCS



Fig 3. After 10 treatments using WMCS



Fig 4. After 14 treatments using WMCS



Fig 5. After 21 treatments using WMCS



Fig 6. After 45 treatments using WMCS

Conclusion

Current of injury has the effect on the migration of cells that are involved in the phases of wound healing, such as neutrophils and fibroblasts.⁶ Even this effect of polarity is stronger when a direct current electrical stimulation is applied, as shown by Wolcott *et al* in the early 1960s.⁷ Chronic wounds like diabetic ulcer which are characterized by the difficulties to heal, have been reported to show reduced levels of current of injury.⁸

This study has shown the benefit of Wireless Micro Current Stimulation in promoting wound healing process of chronic diabetic ulcer. A combination of Wireless Micro Current Stimulation and standard wound care treatment provides a good result, and after 45 sessions of treatment using WMCS, the hard-to-heal diabetic ulcer is completely healed. During treatment, the patient didn't feel any pain, and the risk of infection was minimized. Wireless Micro Current Stimulation technology clearly provides a better option in wound care management setting.

References

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