

# A neuromuscular electro-stimulation (NMES) device and its contributing effect in managing Vasculitis & Psoriasis wound therapy

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## Background

This case study examines the management of a chronic wound in a 52-year-old hypertensive male with vasculitis and psoriasis, resulting from an autoimmune condition. Initially misdiagnosed as a "pimple" on his foot, the wound progressed significantly, leading to complex treatment challenges.

After declining amputation, the patient underwent a combination of wound care therapy and neuromuscular electrical stimulation (NMES). Several challenges arose due to his limited mobility and severe psoriasis.

Chronic wounds, particularly those linked to autoimmune conditions such as psoriasis, pose significant treatment challenges. This study aims to assess the effectiveness of a combined treatment approach, including the use of the geko™ device (NMES), in promoting wound healing within the context of the patient's underlying condition.

## Method

### Wound Assessment

A thorough clinical examination clarified the patient's true diagnosis.

- **Initial Presentation:** Initially described as a "pimple" on the foot, the lesion progressed into a significant wound.
- **Diagnosis:** Vasculitis related to an autoimmune disease, confirmed via biopsy.
- **Clinical Signs:** The wound deteriorated significantly, extending from the base of the toes to the tibial tuberosity anteriorly.
- **Challenges:** The patient remained immobile in an informal dwelling with no access to wound care.
- **Initial Care:** Makeshift wound care included the use of KY jelly and a plastic bag. The patient was later hospitalised but refused amputation.

## Treatment Plan

The patient's treatment journey involved a combination of wound care, pharmacological intervention, and nutritional support. After a three-month period without access to formal healthcare, the patient was transported to a clinic where professional treatment could begin.

Following a three-month period without access to formal care, the patient was transported to a clinic where professional treatment commenced.

### Topical Treatment:

- Application of Jelone®, gauze, bandages, and hypochlorous acid was used to manage the wound locally.

### Pharmacological Intervention:

- The patient was initially prescribed methotrexate and folic acid.
- After four years, methotrexate became ineffective due to the development of severe psoriasis.
- The medication was replaced with Abitrexate, which, while necessary for managing autoimmune flare-ups, significantly impacted wound healing and the application of the NMES device.
- The patient maintained monthly visits to the provincial hospital for autoimmune treatment and weekly visits to a wound care clinic.

### Nutritional Support:

- To support immune function and tissue repair, multivitamins, zinc, vitamin C, and protein supplements were donated and incorporated into the patient's care plan.

## The geko™ Device in Treatment

The geko™ device was introduced into the patient's treatment plan to support wound healing by enhancing circulation. By stimulating the calf and foot muscle pumps, the device increases blood flow and microcirculatory flux, promoting tissue repair in compromised areas. Initially, the patient used it for 8 hours daily but later adjusted to the recommended usage routine. Despite an active autoimmune flare-up and complications associated with Abitrexate, the wound showed notable improvements in colour and tissue quality within the first week of NMES application, suggesting a strong initial response to the device.

## Results/Discussion

Over the five-week period in which the geko™ device was used, the patient showed encouraging signs of wound improvement, with the device contributing positively to local circulation and healing. It proved to be a highly effective adjunct therapy.

This case highlights several key insights into the management of chronic wounds associated with autoimmune conditions:

**Treatment:** The use of a neuromuscular electrical stimulation (NMES) device showed promise as an effective adjunct therapy.

**Tissue Quality:** Notable improvement in granulating tissue and a visible reduction in exudate.

**Challenges:** Managing chronic wounds in patients with autoimmune conditions is complex—particularly in resource-limited settings.

**Limitations:** Several barriers to optimal healing were present, including:

- Ongoing autoimmune disease activity
- Limited access to adequate nutrition
- Interruptions in treatment
- Side effects of long-term medication use
- Social and financial constraints

## Conclusion

This case study underscores the importance of integrated and adaptive care in the treatment of chronic wounds, particularly in patients suffering from autoimmune diseases. Although the patient faced significant barriers—including limited access to healthcare, nutritional deficiencies, medication-related complications, and severe psoriasis—his short-term response to the geko™ NMES device was promising.

Despite the premature discontinuation of NMES therapy, the case reveals potential pathways for enhanced healing and reinforces the need for flexible, patient-centered solutions in chronic wound care.

## Vasculitis healing progression with the application of the geko™ device:



Wound progression after no care.



Application of the device.



11 June - Reduced.



18 June - Reduced.



2 July - Improved.



9 July - Further.

Day 1 of using the geko™ device.

Wound after 5 weeks of using the geko™ device.

