

# USE OF A NOVEL ELECTRICAL STIMULATION DEVICE TO KICKSTART HEALING IN TWO PATIENTS WITH LOWER LIMB ULCERS COMPLICATED BY DIABETES MELLITUS

Dr Salma Alktebi and Dr Amira Al Adab

Wound Care and Plastic Surgery Team, Al Qassimi hospital, Sharjah, United Arab Emirates

## Background and Aims:

Electrical stimulation therapy has been shown to kickstart lower limb ulcer healing with a strong evidence base in the treatment of venous leg ulcers and pressure ulcers.<sup>1</sup> A single-use, portable, easy-to-use electrical stimulation device, Accel-Heal\* has been proven to be effective in previous clinical studies on leg ulcers to stimulate healing<sup>1</sup> and reduce pain.<sup>2,3</sup> This study aimed to investigate the use of Accel-Heal as an adjunctive therapy in the management of diabetic ulcers.

## Methods:

Two patients with non-healing ulcers presenting to our wound clinic, were considered for treatment with Accel-Heal electrical stimulation device (Figure 1). During routine dressing changes, electrode pads were applied either side of the wounds and along-side the chosen wound dressing. Electrical stimulation was applied for 12 days, in line with the instructions for use. Healing was monitored both during this treatment period and after therapy had ended.



Figure 1. Accel-Heal electrical stimulation device.\*

## Results:

### Patient A

A 65 years old male patient, with fairly well-controlled diabetes mellitus, had undergone a left below-knee amputation in December 2019. The patient developed post operative blistering and infection in small area along the surgery site. This progressed to a wound measuring 3x2cm and 2cm deep. Over the subsequent three months, the wound made little progress, despite being managed in the wound clinic, with limited granulation tissue formation and no change to wound dimensions (Figure 2A).

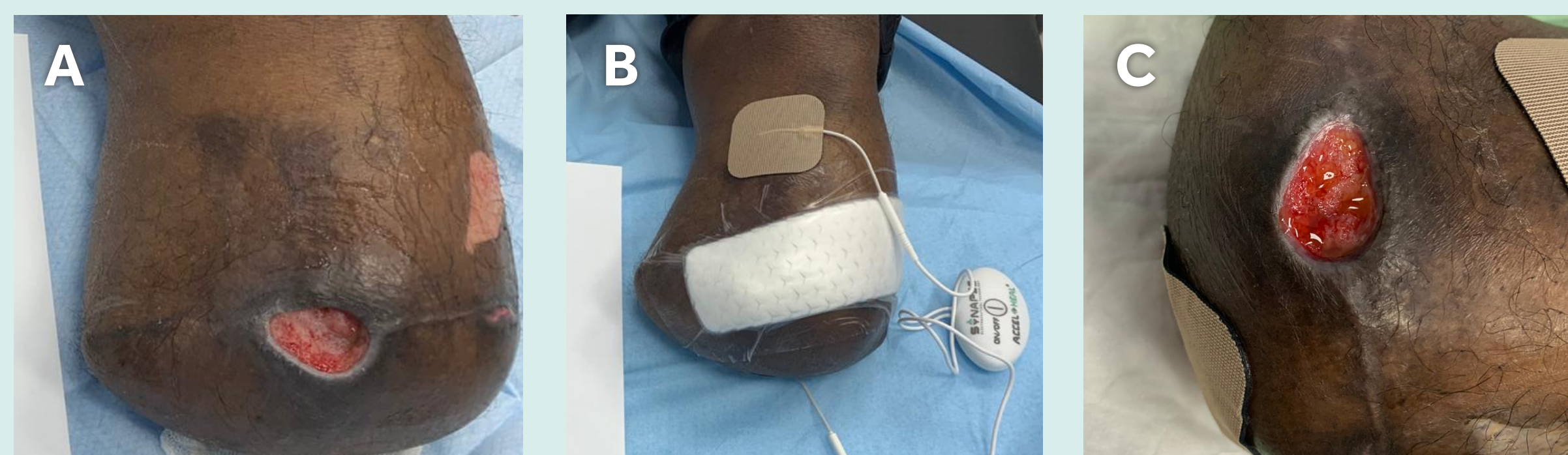


Figure 2. Appearance of the wound before (A), during (B) and immediately after (C) the 12-day treatment period with Accel-Heal.

Electrical stimulation was applied on 3<sup>rd</sup> March 2020, along with a collagen dressing (Suprasorb, L&R, Figure 2B). By the end of the 12-day treatment period, (Figure 2C) the wound was observed to have progressed, with an improvement in granulation tissue obvious. Accel-Heal treatment was removed at this point and the wound was treated with Epifix.

By 14<sup>th</sup> April the wound had progressed well towards healing and was switched to a paraffin gauze dressing (Jelonet, S&N; Figure 3A). Last visit for the patient was on 23<sup>rd</sup> April 2020, eight weeks after starting treatment with Accel-Heal, at which point the wound had healed completely (Figure 3B).

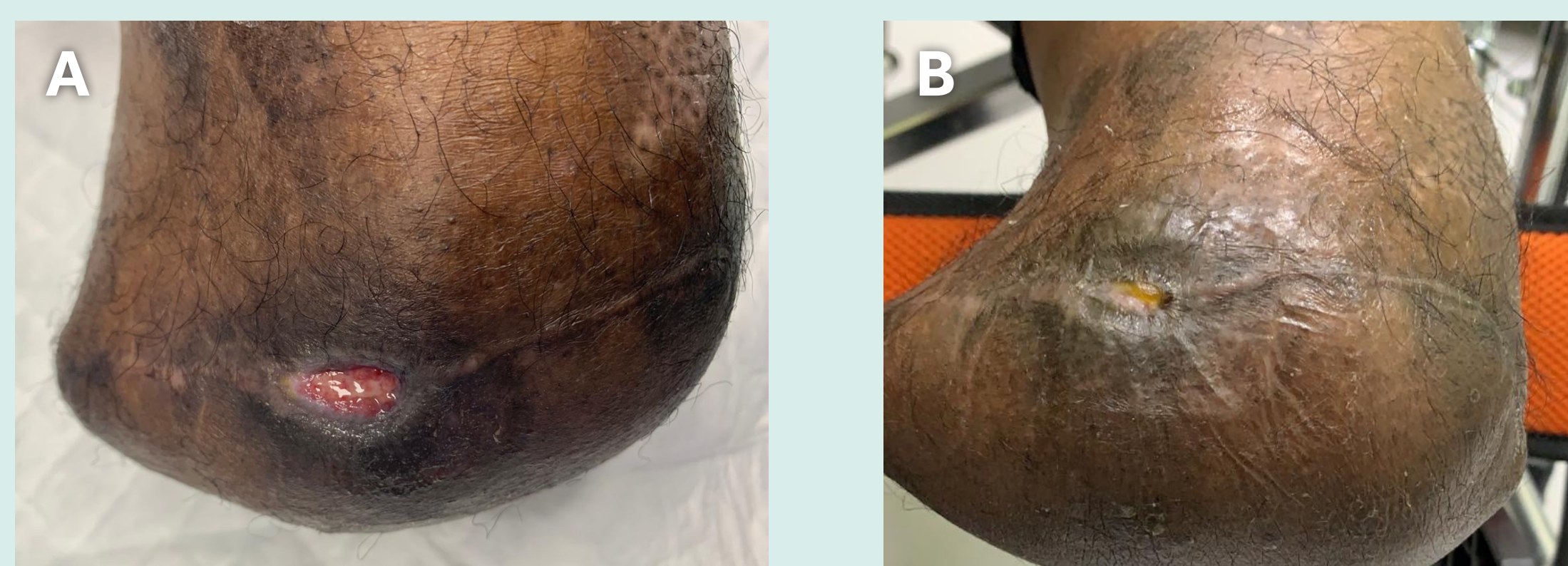


Figure 3. Continued wound progression following treatment with Accel-Heal. Reductions in wound size were evidence by approximately 6 weeks (A) and the wound was healed 8 weeks (B) after starting Accel-Heal therapy.

### Patient B

A 67-year old man with poorly controlled type 2 diabetes, hypertension and on dialysis for the management of end-stage kidney disease, presented with a diabetic foot ulcer of 15-years duration. The patient had a history of repeated wound debridement procedures and treatment with different wound dressings. He had always been reluctant regarding use of off-loading shoes or devices.

Electrical stimulation was applied on 17<sup>th</sup> March 2020, (Figure 4A) along-side a collagen dressing. (Suprasorb X, L&R). The dressing was changed every other day. The patient was also supported to use off-loading shoes and to improve his blood sugar levels.

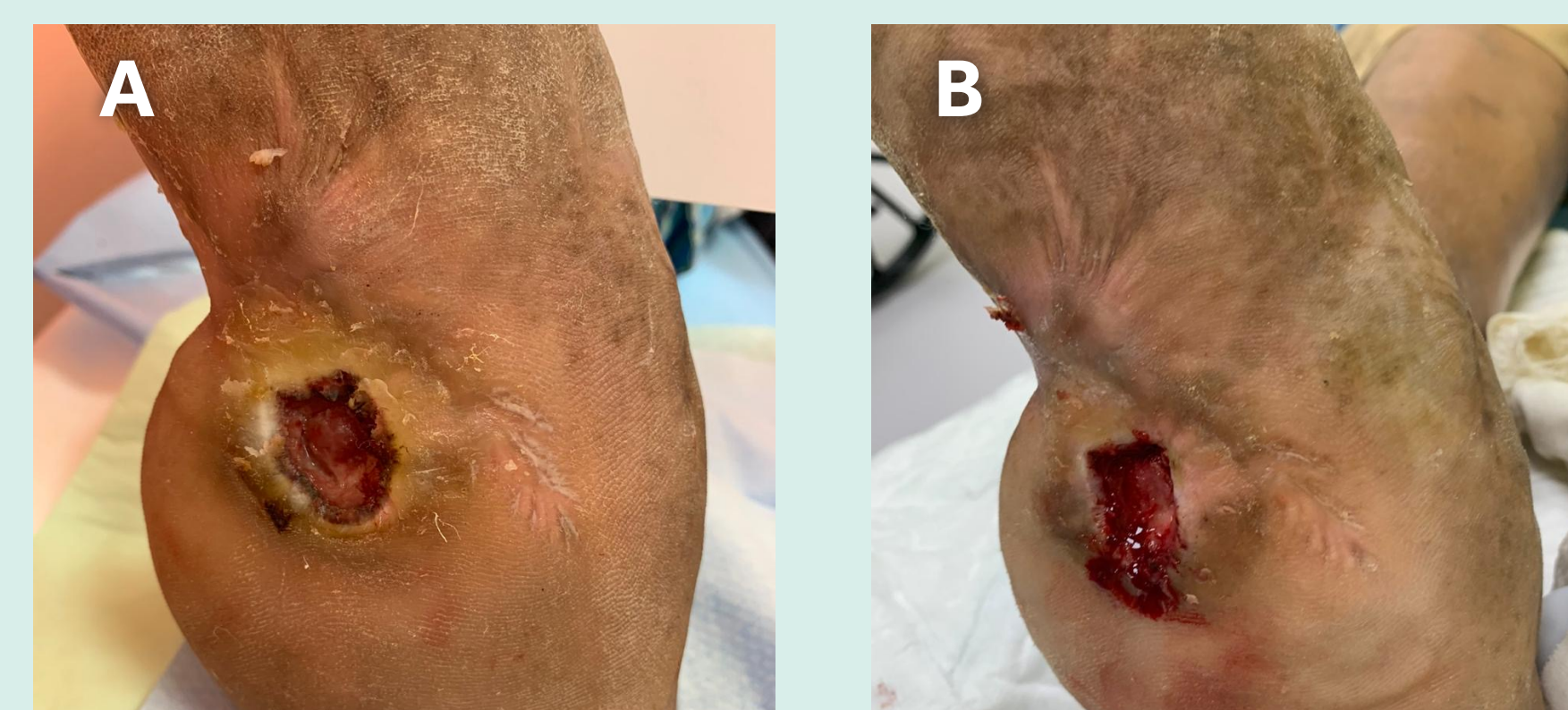


Figure 4. Appearance of the wound before (A), and immediately after (B) the 12-day treatment period with Accel-Heal.

At the end of the 12-day treatment period an improvement in the wound was noted (Figure 4B).



Follow up was hampered by the COVID-19 pandemic with the patient reluctant to attend clinic. However by 4<sup>th</sup> June, approximately 11 weeks after starting Accel-Heal therapy, the wound was fully healed (Figure 5).

Figure 5. Continued wound progression following treatment with Accel-Heal. The wound was healed approximately 11 weeks after starting Accel-Heal therapy.

## Conclusions:

Accel-Heal was used with the aim of kick-starting healing in two previously non-healing diabetic foot ulcers. During the 12-day treatment period, the condition of both wounds improved.

This improvement continued after the Accel-Heal treatment came to an end; excellent results were observed in both patients, achieving full wound closure within 2 months of starting treatment with Accel-Heal.