A neuromuscular electro-stimulation device (the geko™ device, Firstkind Ltd) as an adjunct therapy in the management of a venous leg ulcer

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Introduction

Venous leg ulcers (VLUs) are open lesions on the lower limb (on or above the malleolus), in the presence of venous disease that take longer than two weeks to heal.[1] They are typically long lasting with a high risk of recurrence resulting in a negative impact on a patient's health related quality of life. Approximately 1.5% of the adult population in the UK is affected by active leg and foot ulceration, with prevalence increasing with age.[2]

This case study discusses the wound management of 84-year-old John (pseudonym), an ex-smoker with a past medical history of hypertension and iron deficiency anaemia. John was referred to the tissue viability nurse (TVN) with non-healing venous leg ulcers of over 3 months duration to the lateral gaiter area of his left leg. Whilst John was mobile, he nonetheless sat in his armchair for protracted periods of the day.

Method

On examination, John's largest heavily exuding wound, measuring 14cm x 13cm, was static with 60% slough and 40% granulation tissue. There was extensive maceration to the plantar surface of his foot due to the level of exudate, with no advancement of the wound edges. The TVN considered that with its non-healing status and exudate that the presence of biofilms was highly likely.[3]

The aims of treatment were exudate management, wound debridement and ultimately wound healing. The treatment plan included polyhexamethylene biguanide hydrochloride and betaine gel for wound cleansing, a silver primary dressing and foam secondary dressing, together with compression therapy in the form of short stretch bandaging.

A Neuromuscular Electro- Stimulation (NMES) device (the geko™ device, Firstkind Ltd) was introduced as an adjunct to the existing treatment regimen to aid in the healing process by augmenting venous and arterial blood flow. The device was positioned (as per the instructions for use) to the skin overlying the common peroneal nerve at the head of fibula on his affected leg. A moderate regular twitch of the foot indicated that the muscles of his leg and foot were being stimulated every second. The usage was 12 hours on and 12 hours off each day for seven days a week. The positioning of the device was marked so that John could remove and re-apply the device himself at home.

Results

John tolerated the new treatment regimen well with a marked improvement evident within the first two weeks of use. After 12 weeks John's wound had significantly reduced in size measuring 6.7cm x 4.5cm equating to an 83.6% surface area reduction. The wound was covered with 100% granulation tissue. John stated that he felt he had more mobility in his ankle whilst wearing the geko™ device.

Discussion

The geko™ device is a small disposable, internally powered device that is applied externally to the leg. It is self-adhesive and applied to the outer/lateral aspect of the knee. This positioning enables integral electrodes to apply a stimulus to the common peroneal nerve. The stimulation of this nerve by the device causes the muscles to contract isometrically and will not affect normal movement of the limb nor mobility of the patient.

Contraction of the muscles comprising the calf and foot muscle pumps will boost blood flow from the lower limbs back to the heart, thus increasing venous return and local blood circulation.[4] The geko™ device has several stimulation levels to balance maximal effect of calf and foot muscle stimulation with patient comfort.

Electro activation of the muscle pumps has been used successfully to treat hard-to-heal leg ulcers[5] as an adjunctive therapy together with best practices for the management of VLUs, because of its ability to increase blood circulation thus augmenting blood supply to the leg.

Conclusion

The use of the geko™ device in this case accelerated the rate of healing of this large, static venous leg ulcer. The enhancement of both venous flow and the additional enhancement of microcirculatory flow delivered by the device created a positive benefit. This case suggests that the use of the geko™ device offers an effective adjunct treatment option for hard to heal venous ulcers.

John was very excited to try this innovative device, feeling included in his care as he was able to remove and reapply the device himself. He was delighted to see the difference in his wound which was finally on the pathway to healing.

04 February 2022, before the geko™ device

05 April 2022, starts the geko™ device

06 June 2022, 3 months later

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