

Healing a chronic venous ulceration using the Southland Snail, an innovative pressure device

Pagan A

Abstract

Recalcitrant venous ulcers pose a myriad of challenges for healthcare professionals managing them. Patient and wound related factors affect the healing process and need to be identified and managed appropriately, with adequate resources and by experienced healthcare professionals¹. This case report illustrates the effectiveness of applying an inexpensive supplemental pressure device under compression bandaging to a recalcitrant ulcer to achieve wound closure.

Introduction

The Southland District Health Board is a secondary level health service serving a population of 107,000. A nurse-led wound care clinic is situated in the outpatient department at Southland Hospital. The clinic provides focused wound assessment and individualised patient management plans, health education and promotion activities, and ongoing management for patients requiring compression therapy. Specialised wound clinics have been proven to standardise practice, be cost-effective, reduce hospital admission rates, improve healing and reduce wound recurrence rates^{2,3}. Nurse-led services also support critical thinking and innovative practice⁴.

Despite best wound care practice, some venous ulcers remain unresponsive to treatment⁵. This may be attributed to the imbalanced cellular activity in chronic wounds which exhibit elevated levels of proinflammatory cytokines and matrix metalloproteinases (MMPs) and low levels of tissue inhibitor of metalloproteinases (TIMPs); however, if corrected, healing can be reactivated⁶. Lipodermatosclerosis, often associated

with venous disease, also signifies a disproportion of specific MMPs and TIMPs in the sclerotic tissue and can precede ulceration⁷.

Ulcers situated in close proximity to the malleolus pose clinical challenges, given that it is difficult to apply sufficient compression in this concave area. Localised supplemental pressure can be achieved by filling the affected area with extra gauze or foam over the ulcer before compression bandaging is applied, thus increasing pressure and improving healing^{8,9}. The following case report demonstrates the use of localised supplemental pressure and presents a novel device developed in our clinic to aid healing in a recalcitrant chronic venous leg ulcer.

Case report

Mr M was an 84 year old gentleman with a 17 year history of recurrent venous ulcerations to both legs despite wearing compression hosiery. These had successfully healed in the past using high-stretch compression bandaging. Mr M presented with a recurrent distal medial malleolus ulcer on his right leg; both lower legs presented with haemosiderin staining, areas of atrophie blanche and lipodermatosclerosis surrounding the wound. The original wound size was approximately 4cm² and was managed with four-layer compression therapy (Profore) from June 2005, progressing slowly over 17 months to approximately 0.5cm² (Figure 1), then becoming static.

Critical thinking and reasoning is fostered within the clinic environment and is achieved in partnership with the

Amanda Pagan RCpN, BN, PGCert HSc
Clinical Nurse Specialist Wound Care
Southland District Health Board, Kew Road
PO Box 828, Invercargill, Southland, New Zealand
Tel (64) 321 81949 ext 8100
Fax (64) 321 81194
Email mandy.pagan@sdhb.govt.nz



Figure 1. Mr M's presenting wound.

patient by exploring alternative therapies, researching the literature, applying interventions, and re-evaluating these¹⁰. In Mr M's case, assessment was based on the TIME wound bed preparation principles⁵. The wound tissue exhibited granulation tissue with minimal areas of yellow fibrin; the wound was not infected but was assessed to be in the chronic proliferative phase of wound healing¹¹. The wound exudate was serous and controlled by weekly compression bandaging, but the wound edge was fibrotic and rolled and therefore not advancing.

It was determined that localised supplemental pressure was required to reduce the rolled wound edge. Initially, additional dressing foam layers were used over the ulcer to try and achieve this but, on evaluation, the foam fatigued and therefore did not provide sufficient pressure to affect any change to the wound edge. It was established that a firmer but pliable device was required. This was fashioned using approximately 25cm of 3-inch stockinet rolled into a conformable shape of a snail (Figure 2) that was approximately 1cm high and was therefore given the nickname 'Southland Snail'. Note that the Snail can be trimmed down to reduce height if necessary.

With informed patient consent, the Southland Snail was applied over the primary wound dressing (silk) with a stockinet interface and held in place with fixomull, a synthetic adhesive (Figure 3) under compression bandaging for 7 days. Mr M was instructed to remove the bandaging and to contact the clinic if he experienced any discomfort or pain from the device.



Figure 2. How to make the Southland Snail – three step method.

On re-evaluation, the clinic team and patient were impressed with the wound edge reduction. After 1 month (Figure 4), the advancement of healing was dramatic; after 2 months (Figure 5), healing continued. Full wound closure was achieved using the Southland Snail after 4 months. The Snail was reused if it was visibly clean but often it provided extra absorptive properties under compression and was therefore discarded and re-made.

Findings

The Southland Snail did not fatigue under compression, its shape conformed well and it provided sufficient sustained pressure shown by the impression on the skin (Figures 4 & 5). With continued use, Mr M's surrounding lipodermatosclerosed skin became supple and softer. At no



Figure 3. The Southland Snail in situ.



Figure 4. After 1 month using the Southland Snail.



Figure 5. After 2 months using the Southland Snail.

time did he experience pain or pressure damage. These same results have been extrapolated in other patients, including venous ulcers above the malleolus region and facilitating wound union in undermined wounds.

Discussion

The application of localised supplemental pressure to aid healing of venous ulcers is described in the literature^{8,9}. By applying critical thinking principles, the clinical team developed an innovative yet simple and cost-effective device that provided sustained local pressure under compression bandaging to advance healing in a recalcitrant wound. As previously discussed, chronic wounds are distinctly different to healing wounds in both the wound

environment⁶ and surrounding lipodermatosclerotic skin⁷. The Snail provided sufficient pressure to soften the sclerotic skin and flatten the wound edges, but also provided extra absorbency. It is possible that a combination of these factors may have contributed to correcting the cellular imbalance and advancing wound healing. Further exploration and research into this phenomenon would aid our scientific understanding of how this device essentially worked.

On reflection, as clinicians, it is important to nurture and support critical thinking and evidenced-based practice to enhance our learning and ultimately improve patient outcomes. We must also share these learnt experiences so more clinicians and patients can benefit.

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