



Managing Four Cases of Venous Leg Ulcers with Graduated Compression Bandage and Silver Methylene Blue Gentian Violet Polyurethane Foam

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Introduction

Venous leg ulcers (VLUs) are the greatest proportion of chronic wounds in the population over 60 years of age from a retrospective analysis of 5 years data on chronic wounds managed in Shanghai, China (Xiaofang et al, 2017). Venous leg ulcers are most often occur in the gaiter region of the lower leg, from just below the ankle up to mid-calf. They are defined as any break in the skin that has been present for at least six weeks or occurs in someone with a previous history of venous leg ulceration (Norman et al, 2016). Compression therapy (CT) remains the cornerstone of standard care, and adjuvant care with topical or systemic agents is used for wounds that do not heal within 4 weeks (Heyer et al, 2017). A topical foam dressing of polyurethane (PU) integrated with gentian violet (GV), methylene blue (MB) and silver have been studied as a triple antimicrobial action against chronic wound pathogens (Edwards, 2016). Hence, the aim of this study is to evaluate the effect of PU-GV/MB silver foam combined with graduated CT in the treatment of VLU.

Case Series

- We report a 52-year-old obese female patient with diabetes and hypertension who suffered from a 4 years duration of left VLU. Initial assessment revealed an ulcer of 4.5 x 3.5 x 0.5 cm above the left medial malleolus with signs of local infection. ABSI charted as 0.83 and there was no evidence of osteomyelitis on X-ray analysis. This ulcer has not responded well to the compression therapy in combination with various previous topical dressing. (Figure 1A-1D)
- A 49 year old obese female working as cook with hypertension developed two ulcers over the left gaiter region due to a trivial trauma 19 months ago but showed no advancement despite regular dressing. ABSI recorded 1.22 with no osteomyelitis on X-ray film. (Figure 2A-2D)
- We report a 54 year old female who underwent venous stripping surgery 5 years ago for her varicosity and developed a wound above the left ankle for 8 months and worsening over the past 2 weeks. Wound assessment discovered an ulcer measuring 6cm x 5cm x 0.5cm with an eczematous periwound and signs of local inflammation. ABSI was within normal range and no evidence of osteomyelitis. (Figure 3A-3D)
- The last documented case was a 65 year old female with no known comorbidities who had a non-healing ulcer above the right medial malleolus for more than a year. Documented ABSI 1.07 and no osteomyelitic changes on the X-ray film. The patient was never advocated for compression therapy and was doing daily dressing with super-oxide solution with no recovery. Wound assessment revealed an ulcer measuring 8.5cm x 7cm x 2cm with a sloughy base and signs of local inflammation. (Figure 4A-4D)

Methods

Wound progression and pain scale were assessed by charts provided by the Malaysian Ministry of Health (MOH). All dressing procedures were carried out based on the MOH Standard Operating Procedures. The wound was cleansed with sterile water, the silver, methylene blue, gentian violet foam was placed onto the wound bed and was secured by taping after circumferential gauze to gauze cover. Conventional secondary

dressing and orthopedic bandage were applied before the application of graduated compression bandage. This protocol was repeated every two days initially, then converted to every three days regime until complete re-epithelialization.

Results

A reduction of wound surface of 38% was seen from day twelve and the wound achieved complete re-epithelialization at six weeks duration. Local infection subsided at day six onwards. Pain score had reduced from day nine and onwards. Rapid wound healing observed until wound closure which took a total of six weeks.

Discussion

The results from this study revealed a significant reduction of wound surface area to complete healing in six weeks duration. Although the mechanistic action of the PU-GV/MB silver foam dressing is not fully known, it is understood that the mechanical properties of the foam facilitate the wicking of wound exudate away from the wound surface into the dressing itself. Inside the foam dressing, it has been posited that the two antibacterial bound to the foam creates a microenvironment that inhibits the metabolism of microorganisms by altering the oxidation / reduction potential inside the dressing to a state not conducive to bacterial growth or attachment (Hoffmann et al, 1944). We believe that the combination of the antimicrobial properties in the PU-GV/MB silver foam and the compression therapy contributed to its successful wound healing in this case series. These all 4 ingredients creates singlet oxygenation to initiate healing process from chronic wounds which fail to heal. With easy to use, comfortable and surface conforming advanced modern dressing, the wound healed faster.

Conclusion

Graduated compression bandage with silver, methylene blue and gentian violet polyurethane foam is effective in healing these chronic wounds. Cost effectiveness and reduced clinic visits thus improved quality of life attained by the patients. Furthermore, large clinical trials are needed to establish the efficacy of this notable blue foam in treating venous leg ulcers. Despite wound closure, all the patients were recommended to wear above knee compression socks to prevent wound recurrence.

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