Effect of Compression... Beyond the Swollen Leg

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ABSTRACT

Purpose: Compression applied to the lower extremity is standard for the management of venous leg ulcers (VLUs). Mechanisms of the impact of compression on healing of VLUs has focused primarily on the impact that compression has in maintaining venous return with concomitant reduction of tissue edema. However, there is an extensive literature that supports the use of flexible or "elastic" compression, which can be applied directly to contact the wound and has devices that distribute the compression to peripheral intact skin. The findings of these studies demonstrates that compression has beneficial effect on wound healing. However, to date the authors of this case study have found no mention of the impact of compression on the subcutaneous tissue. Chronic non-healing wounds have a unique combination of edema and skin stiffness. The localized variation of compression directly on the skin, wound base and margins has demonstrated signs of enhanced edge effect as evident by resolution of induration and fibrosis in the peri-wound tissue, thereby increasing performance to promote wound healing.

MATERIAL AND METHOD

Fuzzy Wale Elastic compression textile is a product that consists of fuzzy woven fabric to create a unique compression approach that impacts the subcutaneous tissue. The textile has an open basket weave structure that is designed to hold a specific volume of fluid. The compression profile created is comparable to "fluid" compression (15, 30mmHg).

This is a natural evolution of the patient’s compression system. The textile system consists of three main units for treatment of face and leg ulcers: The textile is designed to maintain a constant volume of fluid in/around the wound causing an improved edge effect as evident by resolution of induration and fibrosis in the peri-wound tissue, thereby increasing performance to promote wound healing.

Each patient received moist wound care and Fuzzy Wale Elastic compression textile either in direct contact with or over a single layer fine knit layer. Data collected included volume change, wound areas and time to wound closure.

Case 1
A 1 year old female with chronic pressure cutaneous ulcer round due to deep dependancy
- Primary treatment: NPPD, moist wound care, collagen, topical debridement with allograft placement, 4x4 dressing.

Case 2
- 3 year old female with chronic venous ulcer due to LE
- Primary treatment: NPWT for VLU, dressing, PO, Lint, 1% Dakin's Weekly treatment

Case 3
- 6 year old male with diabetic ulceration (all sites)
- Primary treatment: NPWT for VLU, dressing, colloid, 3M, 1% Dakin's

Conclusion

The addition of Fuzzy Wale Elastic textile demonstrated on immediate positive impact on the macroscopic tissue edema observed, seen at patients those traditional rural grade compression (i.e. those with <4x4 cm) is counter productive. The Fuzzy Wale Elastic textile demonstrated reduction of volume, stiffness, edema in tissue the wound base and margins with improvement in edge effect as well as reduced hemostasis existing in the surrounding tissues. Migration of epithelial cells along the margin (can be simply explained).

There is clearly need for additional scientific investigation looking at the mechanism of actions of the type of compression, as well as on a cellular scale the impact of the applied compression and edema management.

References