

The use of strapping to increase local pressure: reporting of a sub-bandage pressure study

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Abstract

High compression is the gold standard for venous ulcer management. This brief report presents the results of a sub-bandage pressure study that investigated the pressures received from compression therapy in the region of the retromalleolar fossa. The study tested the hypothesis that therapeutic compression is not achieved behind the malleolus. The results confirm this, showing that less than 5-mmHg sub-bandage pressure is achieved despite high compression at the B1 level. This report demonstrates that the application of novel strapping below the malleolus substantially increases the compression at rest, standing and dorsiflexion. The clinical implications of this are discussed.

Introduction

The development of the strapping technique has been discussed and presented previously.¹ This technique was developed in response to the clinical complexities seen in lower limb ulceration where the ulcers are on the foot or behind the malleolus in the retro malleolar fossa. These sites typically prove difficult to heal with standard high compression therapy. This small study tested the hypothesis that standard high compression does not apply adequate pressure in this region; that therapeutic compression is only achieved at B1 or gaiter area. Standard compression therapy is ineffective in the retro-malleolar fossa region due to bandage hammocking from the heel to the malleolus. This study aimed to test this hypothesis and provide some evidence for the clinician and patient experience of this novel technique.

Materials and Methods

The sub-bandage pressures were obtained using a Picopress® [Microlab Elettronica Sas, Roncaglia di Ponte San Nicolò (PD), Italy] with

probes at standard B1 plus the retromalleolus fossa, both medially and laterally. Cohesive inelastic compression (Actico, Lohmann & Rauscher GmbH & Co. KG, Neuwied, Germany) was applied using a standard regime of 10 cm spiral or a non-standard 8cm in a figure of 8 from the toes. These regimes were compared with additional strapping. Strapping was applied in a fan distribution¹ (Figure 1). Sub-bandage pressures were collated at resting, standing and at dorsiflexion.

Results

The mean pressures at B1 using cohesive inelastic regime were 42 mmHg at rest and 62 mmHg on standing. Figure 2 demonstrates the range of sub-bandage pressures exhibited from the probe placed behind the malleolus. When the probe was placed in the inner/medial or outer/lateral retromalleolar fossa, the pressures were under 5 mmHg at rest, standing and on dorsiflexion. With the application of strapping, pressures in this region increased, ranging from 25 mmHg to 48 mmHg (Figures 2-4).

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Figure 1. Fan strapping.

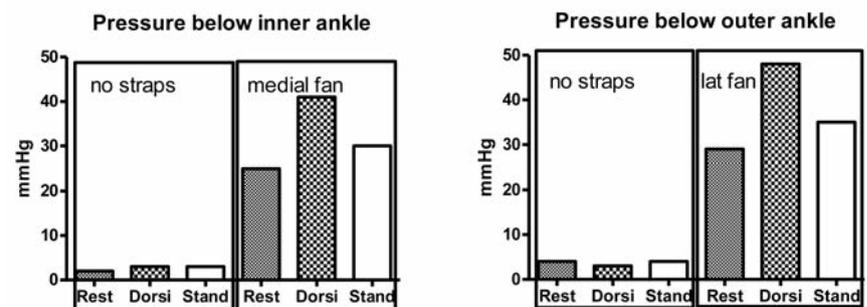


Figure 2. Range of sub-bandage pressures.

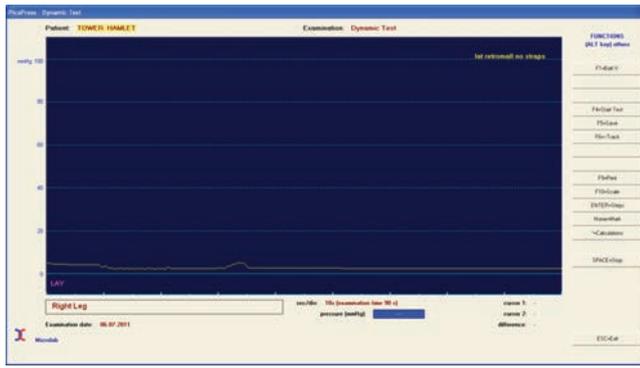


Figure 3. Lateral ankle, no straps.

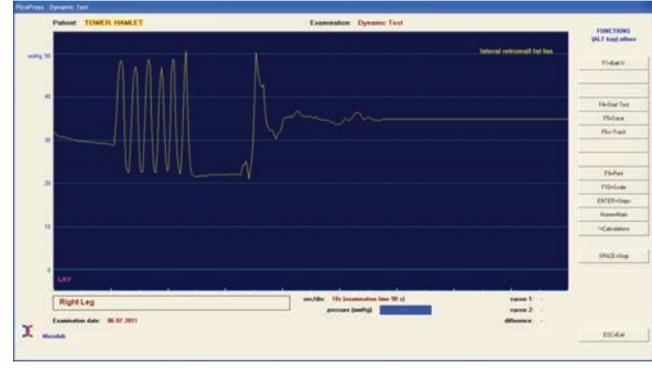


Figure 4. Lateral ankle, with straps.

Discussion and Conclusions

This simple study confirmed the hypothesis that standard high compression does not provide compression to the retromalleolar area despite achieving high pressures in the B1 area. Thus this region does not receive therapeutic compression. The use of a strapping technique has been shown to significantly increase compression to this area.

The authors contend that this is of clinical significance. Where there is non-healing ulceration below the ankle and on the foot, this technique targets that area. High compression can be focused on the site without resorting to increasing compression through multiple layers of bandage from toe to knee; thus manage-

ment is tailored to the patient and limb improving tolerance of treatment. Patients report that they feel the additional pressure from the straps, that it promotes a support to the ankle and offers pain relief. This novel technique impacts on compression stiffness and also assists in reshaping the foot and anatomical shape of the malleolar fossa; the latter has often been lost through edema and reduced ankle range of motion. The pressures demonstrated at the ankle region through the use of the strapping dispute the promotion of standardized compression regimes for all patients.

The strapping technique was developed in a primary care trust. The authors claim this is a key factor in having a venous ulcer prevalence of 0.14 per 1000.²

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