



# Advanced Pneumatic Compression Therapy for the Treatment of Chronic Lower Extremity Venous Stasis Ulcerations

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## INTRODUCTION

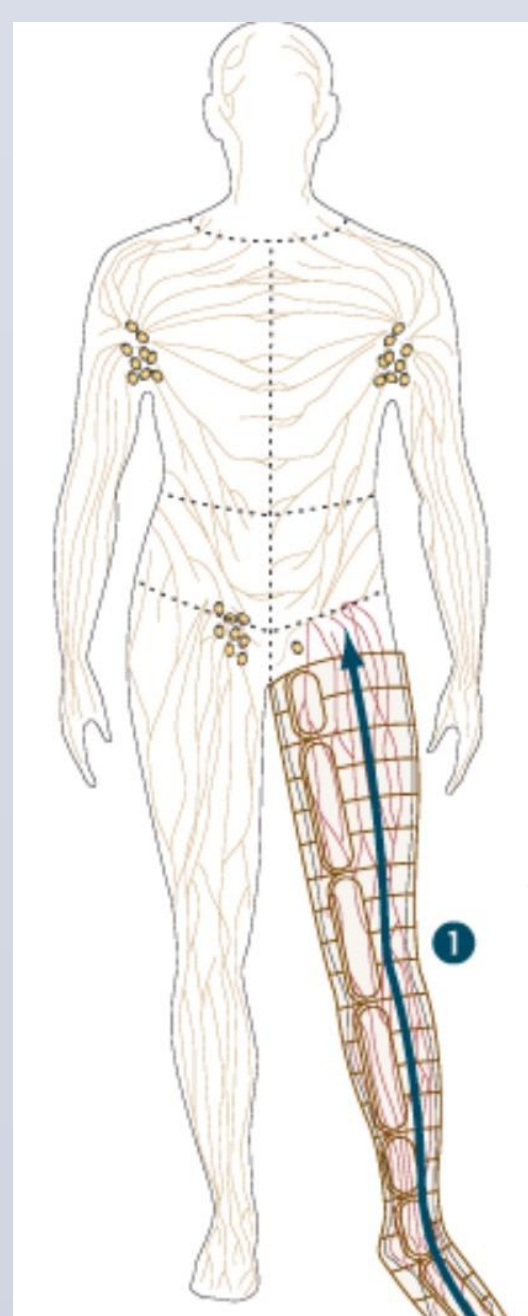
Chronic venous insufficiency increases capillary filtration and interstitial fluid leading to recurrent venous stasis ulcerations (VSU) in the lower extremity [1]. Patient compliance with compression stockings, the current standard of care, is complicated by difficult application and are not effective in sedentary patients. In fact, as many as 63% of patients are non-compliant with standard compression therapy. Thus, healing rates for VSUs using conventional treatment are typically poor, and reoccurrence in five years is as high as 89% [2]. Therefore, adjunctive therapies are warranted to increase patient compliance and reduce the recurrence of ulcerations.

This case series details two veterans with chronic VSU that had failed traditional compression stockings. The Flexitouch® (FT) system, a pneumatic compression therapy device, was prescribed for the treatment and prevention of VSU.

## METHODS



The Flexitouch® system\* provides intermittent pneumatic compression to the lower limb, and is intended for use in the treatment of lymphedema, venous insufficiency, and concomitant wounds.[3-4] Therapy consists of the dynamic application of mild pressure over small therapeutic areas.



Consistent with the physiological principles of the lymphatic system, the FT system delivers sequential pressure to the affected limb via an advanced programmable controller and garment set with up to 32 small chambers. Therapy transports excess fluid in a distal to proximal direction. Brief chamber inflation/deflation over 1-3 seconds creates a gentle, dynamic, short-acting work and release therapy that mimics manual lymphatic drainage treatment. In previous studies, mean limb volume reduction was 8% [5].

Cases are measured in weeks after presentation with VSU to podiatry clinic. Each patient received at-home device education by FT representative upon prescription of pump.

## CASE 1

61 year-old male veteran with chronic venous insufficiency, depression, spinal stenosis, and tobacco use

- Veteran had extensive history of recurrent venous stasis ulcerations to his right medial malleolus. Historically, these ulcerations would heal with compression stockings, but frequently recurred due to patient's poor compliance with this treatment. Patient had significant pain to ulcerations which limited treatment options.
- On week 1, veteran presented to clinic with a recently reopened fibrotic venous stasis ulcer to the right medial malleolus and pain out of proportion. Patient was fitted for new compression stockings, however struggled to apply them and did not wear them regularly. Patient's initial right medial malleolus ulceration healed at week 5. On week 9, patient reported that his wound had reopened and closed again between clinic appointments. In week 23, patient presented with new fibrotic left medial malleolus ulcer and was prescribed lymph pumps.



Fig 1: Case 1 before pump use

- Patient was prescribed a full leg garment for 45 minute treatments bilaterally. Patient had one treatment every A.M. for left extremity and one treatment every P.M. for right extremity.
- Left ulcer healed at 33 week follow up. Patient tolerated pumps well and has been compliant with daily use.
- After 5 months of daily pump use, patient has significantly decreased edema, improvement in skin texture, and no recurrence of full-thickness ulcerations.



Fig 2: Case 1 after pump use

## CASE 2

83 year-old male veteran with peripheral vascular disease, chronic venous insufficiency, and dementia.

- Veteran had history of chronic bilateral medial malleolus venous stasis ulcerations present for 2.5 years. Patient's treatment course was complicated by several hypersensitivities to wound care products including adhesives, chlorohexidine, and Unna boots.
- Five months prior to patient's presentation to podiatry, vascular surgery performed radiofrequency ablation of bilateral perforator veins, which was unsuccessful in healing his ulcerations.
- Patient presented to podiatry with bilateral medial malleolus venous stasis wounds and failed several treatments including compression stockings and collagen dressings. On week 18, wound size decreased following amniotic graft. On week 20, patient returned from a long flight and presented with significantly increased wound size. He was treated with amnion dressing and had some improvement. Patient started lymph pump therapy on week 23.



Figs 3 and 4: Case 2 before pump use

- Patient was prescribed half leg garment for 30 minute bilateral treatments. Patient had one treatment every A.M. for left extremity and one treatment every P.M. for right extremity.
- After four months of pump use, patient had significantly reduced edema, complete closure of right ulcer, and a 60% reduction in size of left ulcer.



Figs 5 and 6 Case 2 after pump use

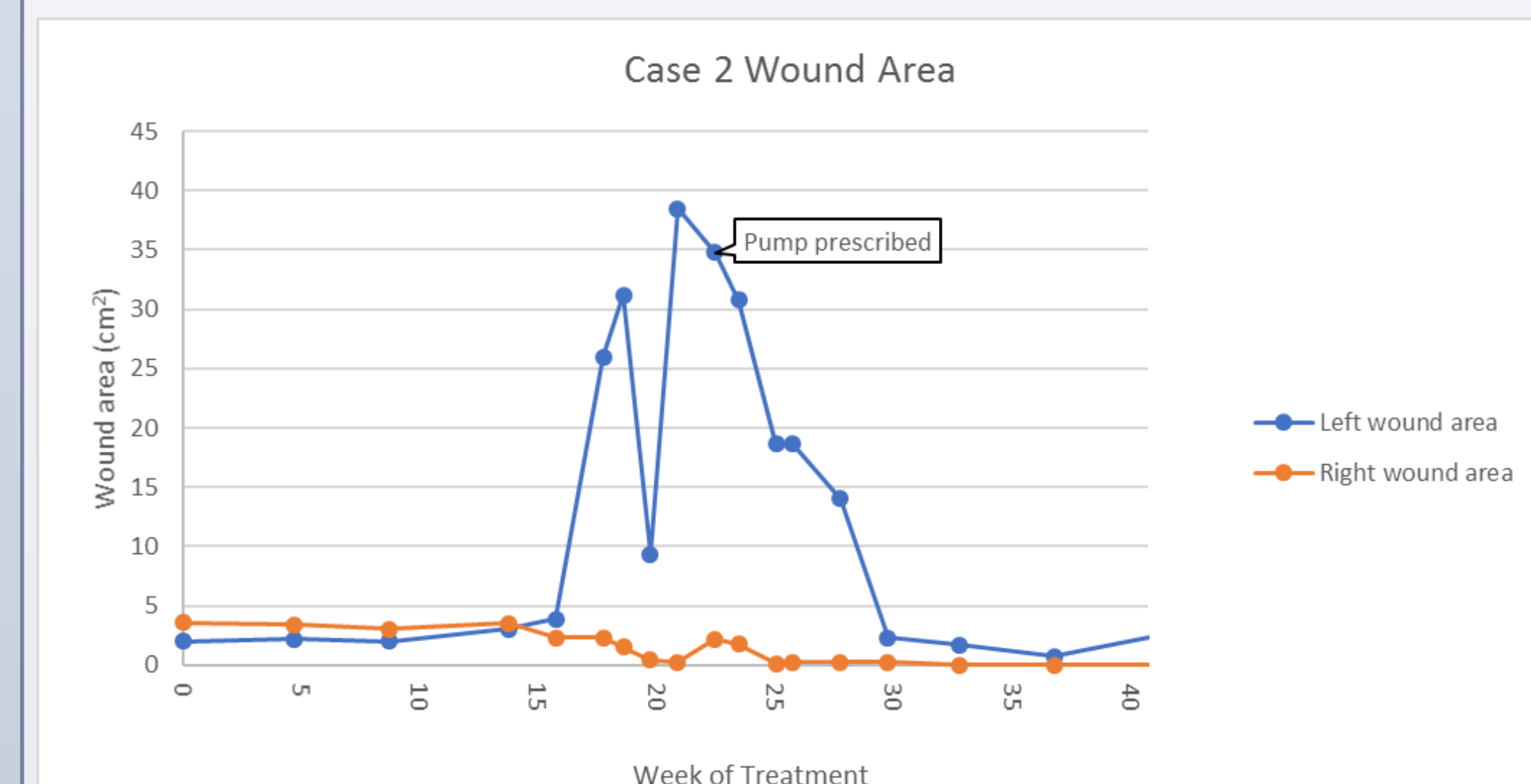


Fig 7: Case 2 wound area by treatment week

## CONCLUSION

Two patients with venous stasis ulcerations secondary to chronic venous insufficiency with poor improvement on compression stockings were provided Flexitouch® pneumatic compression therapy for at-home use. In both cases, patients had improvement of venous stasis ulcerations, decreased lower extremity edema, and have remained compliant with daily use of Flexitouch® pumps. These results support advanced pneumatic compression therapy as effectively transporting fluid proximally to reduce interstitial load and show higher patient compliance for the treatment and prevention of chronic venous stasis ulcerations.

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