

Increased Autonomy and Consistent Compression with an Adjustable Air-filled Compression Device

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BACKGROUND

Compression is the principal therapy for managing both chronic venous insufficiency (CVI) and lymphedema (LE). Given the prevalence of VLU and other sequelae from these diseases, a large market of compression therapies has emerged. Most require weekly applications by trained professionals. Our practice trialed a new removable air-filled compression system that delivers gradient compression to lower extremities.

METHODS

19 patients with unilateral or bilateral CVI or LE were included in this pilot study using Aero-Wrap™ as either the primary form of compression or as an adjunct to compressive bandages. These patients were all receiving compression at enrollment. Circumferential measurements of calf, ankle and foot were taken weekly over 1 month. Patients were surveyed on ease of use and overall satisfaction with this device.

RESULTS

There were 27 limbs enrolled, 15 legs with diagnosed CVI and 12 with LE. Eight patients, 5 with LE, stopped wearing the device mid-study preferring prior forms of compression therapy. Additionally, 3 of 4 patients who used the device overtop multi-layer compression didn't complete the study.

Of the 11 who completed the study, there was a mean circumferential decrease of $0.41 \pm 4.64\text{cm}$, ($-11.5 \pm 12\text{cm}$) in the calf, $0.19 \pm 1.73\text{cm}$, ($-4 \pm 4\text{cm}$) in the ankle and an increase of $0.64 \pm 1.98\text{cm}$, ($-2 \pm 5\text{cm}$) in the foot.

After stratification by diagnosis, there was an average 1.5cm circumferential increase in those with LE and a 2.5cm decrease in those with CVI.

Of the 6 patients with wounds, the initial average wound area was 4.6 cm^2 , which decreased by 26% by week 4. Average patient satisfaction of those participating was 8.4/10 and ease of application was rated 4.8/5.



Aero-Wrap™ (Sun Scientific Inc. Dobbs Ferry, New York)

DISCUSSION

This device was effective at maintaining compression for those with lower extremity edema with or without ulcers. Since all patients were getting long-term compression therapy prior to enrollment, the lack of significant differences in leg circumference demonstrates its efficacy.

The device was more successful in CVI patients, possibly due to greater tissue elasticity than LE patients who often have irregular leg shapes and require stiffer bandages. The wrap wasn't tall enough for some patients resulting in calf swelling, however, an extension panel being developed for longer legs could address this. Additionally, contour around the ankle and foot was sometimes an issue.

Overall, the Aero-Wrap™ works well alone or overtop additional compression therapies to prevent swelling and provide consistent pressure. Plus, the ease of application affords patients remarkable autonomy.