

Stasis edema in poorly mobile nursing home patients: A treatment protocol

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Introduction

Prolonged immobility in the sitting position in the elderly is known to produce venous stasis with leg edema and possible skin lesions. Compression stockings and bandages are often applied for treating these clinical problems. But the use of compression stockings or bandages is not always easy to use for the elderly. Adjustable compression Velcro wraps are interesting alternative because of their simple and rapid application and a short learning period. Some studies have already shown interest in different forms of edema and in leg ulcers.¹⁻⁵ A recent study⁶ has shown that this compression Velcro wrap is more effective after a two-hour test than a short stretch bandage in the stasis edema.

It remained to evaluate this compression device under real life in patients living in a nursing home after a test of 30 days and determine the best strategy to maintain the results after the reduction of edema.

The main aim of this study was to quantify the reduction of volume of the legs caused by an adjustable compression Velcro[®] wrap (Circaid Juxtalite[®]) after a daily wearing them for 15 days and to compare the effect on the leg volume for the next 15 days with 15-20 mmHg compression stockings (CS).

Materials and Methods

In this randomized comparative prospective pilot study, 2 groups of 15 patients each were included: i) A first group (Circaid-Circaid) treated with Circaid Juxtalite[®] for one month; ii) A second group (Circaid-CS 15-20) treated with Circaid Juxtalite[®] from D0 to D14 and with a 15-20 mmHg CS (Mediven Microtec[®]) from D14 to D30; iii) Compressive treatment was applied at least 8 hours a day; iv) Circaid Juxtalite[®] was applied in a way to provide a 40mmHg pressure (according the Medi guide card).

Inclusion criteria

We selected patients with poor mobility or unable to walk independently or unable to walk at all.

Exclusion criteria

Bed-ridden patients unable to sit, patients suffering malignancy, patients suffering from congestive cardiac failure/orthopnea, patients with severe renal failure with GFR <30 mL/min (Cockcroft), patients with an ankle brachial index <0.6 and patients with exudative or macerated skin lesions were not included in the study.

Parameters assessed during this study

- Leg volume at D0, D15, D30: volume calculation was done using the truncated cone formula from the circumference measurements (Leg-O-Meter) (Figures 1 and 2).⁷
- Assessment of the skin conditions with photographs were taken at D0, D15, D30.

Statistical methods

The statistical analysis was performed blinded with JMP software (version 12 pro for Mac). The mean comparison of the volume was tested with the Student's *t*-test with a P<0.05 considered as significant.

Results

Four patients were excluded: 2 patients in the group Circaid/Circaid (one for cutaneous infection 7 days after the inclusion and one for delirious episode) and two in the group Circaid/CS 15-20 (one for refusal to wear the compression and one for hospitalization). We noted a volume decrease (Table 1) between D0 and D15 by 10,8% in 26 patients (52 legs). There is no significant difference between the 2 groups at the inclusion (D0) and after 15 days (D15). We observed a non-significant difference at D30. Under the CS the volume increased by 1.3% and under Circaid Juxtalite[®], there was a further volume decrease by 1% (Figure 3).

Discussion

The reduction of volume observed under Circaid Juxtalite[®] is comparable with the previously published results (2.5) in 2 studies. Its quick and easy application (less than one minute according to the personal experience of the authors) does not require the presence of a nurse provided that the staff is properly trained. The learning period

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Table 1. Volume decrease after Circaid Juxtalite between D0 and D15.

| | D0 | D15 | P |
|-------------|--------|--------|-------|
| Mean (mL) | 1355.8 | 1210.3 | <0.05 |
| SD (mL) | 233.3 | 193.4 | |
| % | | -10.8% | |
| Median (mL) | 1330.6 | 1151.9 | |
| % | | -13.5% | |
| Min (mL) | 929 | 831,8 | |
| Max (mL) | 1829.5 | 1591.1 | |



Figure 1. Leg-O-Meter with tape-measures.



Figure 2. Note the decrease in edema of the dorsal aspect of the right foot despite the low local compression.

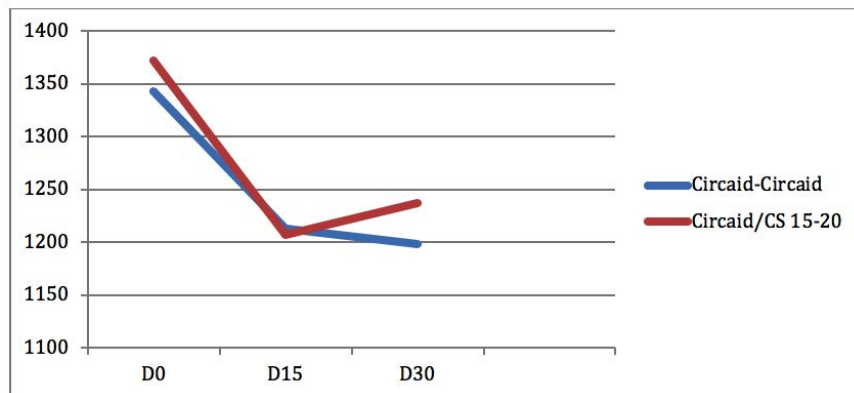


Figure 3. D0-D15 reduction phase, D15-D30 maintenance phase.

for correctly using Circaid Juxtalite^R is short.

The daily application of low pressure CS (15-20 mmHg) seems sufficient to maintain the medium-term results. Indeed, by increasing the tissular hydrostatic pressure at the level of the venous capillaries, the low pressure CS could be sufficient for opposing the venous hyperpressure created by a permanent sitting position in the elderly (Starling's law).⁸

Conclusions

Circaid Juxtalite^R is very efficient in reducing stasis edema in the elderly. Stabilization of the leg volume with the use of 15-20 mmHg CS suggests that the pressure to maintain results does not require high backpressure. This simple fact could challenge the dogmatic view that high pressure is required to maintain the reduction of edema.

References

1. Blecken SR, Villavicencio JL, Kao TC. Comparison of elastic versus nonelastic compression in bilateral venous ulcers: a randomized trial. *J Vasc Surg* 2005;42:1150-5.
2. Mosti G, Cavezzi A, Partsch H, et al. Adjustable velcro compression devices are more effective than inelastic bandages in reducing venous edema in the initial treatment phase: a randomized controlled trial. *Eur J Vasc Endovasc Surg* 2015;50:368-74.
3. Damstra RJ, Partsch H. Prospective of compression bandages in the initial treatment of leg lymphedema. *J Vasc Surg Venous Lymphat Disord* 2013;1:13-9.
4. Mosti G, Partsch H. Self-management by firm, non-elastic adjustable compression wrap device. *Veins and Lymphatics* 2017;6:7003.
5. Caprini JA. Velcro compression devices. *Veins and Lymphatics* 2017;6:1.
6. Benigni JP, Uhl JF, Balet F, et al. Evaluation of three different devices to reduce stasis edema in poorly mobile nursing home patients. *Int. Angiol* 2018 [Epub ahead of print].
7. Devoogdt N, Lemkens H, Geraerts I, et al. A new device to measure upper limb circumferences: validity and reliability. *Int Angiol* 2010;29:401-7.
8. Starling EH. On the absorption of fluids from the connective tissue spaces. *J Physiol* 1896;19:312-26.