Original Article

Pilot Study on the Association of Different Compression Mechanisms to Maintain the Results of Lymphedema Treatment over One Year

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Abstract

Background: Lymphedema is a chronic disease that has no cure but with treatment it is possible to reduce the swelling to close to normal. **Aim:** The objective of this study is to report the association of elastic stockings and low-stretch grosgrain stockings to maintain the results of treatment. **Method:** The maintenance of the results of lymphedema treatment was evaluated for a period of one year in a pilot study. Eleven female and four male patients with a mean age of 58.4 years who had been treated for lower limb lymphedema at the Clinica Godoy were enrolled in this study in 2014. All patients had clinical stage I primary or secondary leg lymphedema; the volume of the leg had been normalized or close to normalized with clinical treatment. After reducing the edema, the patients began to use Venosan® 30/40 mmHg knee length cotton elastic stockings for five days per week and a low-stretch grosgrain stocking twice a week. The paired t-test was used for statistical analysis with an alpha error of 5% being considered acceptable. **Results:** There were no significant differences between the volume of the leg immediately after treatment and one year later (paired t-test: p-value >0.05). **Conclusion:** It is possible to maintain the results of treating stage I lymphedema by combining the use of an elastic stocking with a low-stretch grosgrain stocking.

Keywords: Lymphedema; Treatment; Elastic stockings

Introduction

Lymphedema is a clinical condition resulting from the accumulation of macromolecules in the interstitial space leading to fluid retention which consequently causes increases in volume of the affected region. Lymphedema is characterized as primary when the patient is born with some alteration of the lymphatics and secondary when the patient's lymphatic system is damaged during their lifetime. [1]

There is no consensus on the best form of treatment for lymphedema but an association of therapies is suggested. This association generally includes manual and mechanical lymph drainage, exercises and compression mechanisms, but the psychological aspect of patients must also be addressed. [1,2] In recent years, Godoy and Godoy have developed new concepts of lymph drainage and new constraint mechanisms. [3-6] Furthermore, they propose intensive treatment in an outpatient setting that can reduce the volume of lymphedema by about 50% within five days and even normalize the edema.

The second challenge is to maintain the results; the same forms of therapy can be applied to achieve this. Elastic stockings are the best option at this stage because of their practicality and availability. However, Godoy & Godoy developed a stocking of grosgrain fabric that can be made both at home and commercially and used as constraint during treatment or for maintenance. [5]

The objective of this study is to report the association of elastic stockings and low-stretch grosgrain stockings to maintain treatment results.

Method

The maintenance of the results of lymphedema treatment was evaluated for a period of one year in a prospective clinical trial. Eleven female and four male patients with a mean age of 58.4 years who had been treated for lower limb lymphedema at the Clinica Godoy were enrolled in this study in 2014. All patients had clinical stage I primary or secondary leg lymphedema. According to bioimpedance, the volume of the leg had been normalized or close to normalized with clinical treatment even though the toes remained swollen in some cases. After reducing the edema, the patients began to use Venosan® 30/40 mmHg knee length cotton elastic stockings for five days per week and a grosgrain low-stretch stocking twice a week. The paired t-test was used for statistical analysis with an alpha error of

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5% being considered acceptable. This study was approved by the Research Ethics Committee of FAMERP (#078478/2016, CAAE 58529616.4.0000.5415) and all patients signed written consent forms before starting the study.

Results

There were no significant differences between the volume of the leg immediately after treatment and one year later (paired t-test: p-value > 0.05). Table 1 and Figure 1 shows the volumes of the lymphedematous leg immediately after treatment and one year later.

Table 1: Leg volumes (mL) immediately after treatment and one year later.

Immediately after treatment	One year after treatment	Difference
2862	2801	61
2671	2633	38
2989	2861	128
2622	2573	49
3186	3156	30
3131	3023	108
3264	3256	8
3195	3120	75
2669	2674	-5
2545	2586	-41
2883	2815	68
2625	2642	-17
3322	3314	8
3158	3210	-52
3994	4064	-70

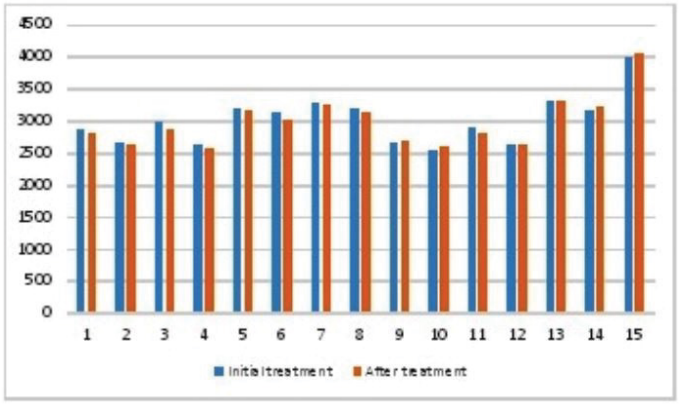

Figure 1: Leg volumes (mL) immediately after treatment and one year later.

Discussion

The current study evaluated the association of Venosan® 30/40 mmHg knee length cotton elastic stockings for five days a week and a grosgrain low-stretch stocking twice a week in the maintenance of treatment results over a period of one year. As part of a research line about compression mechanisms, the current study proves that the combination of elastic stockings and a low-stretch stocking was sufficient to maintain volume reductions obtained by lymphedema treatment.

An initial study compared 20/30 and 30/40 mmHg elastic stockings and a low-stretch grosgrain stocking. The results showed that the use of the grosgrain stocking for one week was sufficient to normalize the limb size after the use of 20/30 mmHg compression. Subsequently, the idea of using a 30/40 mmHg elastic compression stocking for five days a week was evolved.

This study offers options to provide more flexibility in the use of compression mechanisms to maintain the results of lymphedema treatment. However, the flexibility of treatment depends on the situation of each patient. What is observed is that after normalization of the edema, elastic stockings are more useful to control edema. Awareness in respect to the use of these stockings to maintain the results of rehabilitation is fundamental. Patients should be made aware that if they do not follow the treatment prescribed by their care team, lymphedematous legs often begin to swell again.

In venous disease, this adhesion may be influenced by several factors, but the patients present less severe edema than those with lymphedema. Another aspect is that in patients with lymphedema, control must be more rigorous due to the higher probability of relapse. Elastic stockings for lymphovenous disease are well-defined [7-10] however the present study warns about the need to normalize the edema; elastic stockings are only indicated for maintenance. If the volume of the lymphedema is not reduced completely, elastic stockings are not always able to maintain the losses achieved with treatment and the limb can start to swell again.

One study showed that the reduction in limb volume is greater when elastic stockings are used after lymph drainage compared to when lymph drainage is performed in isolation: [11] the adjustment of the stockings has a synergistic effect. [12]

Another aspect regarding the use of socks is the necessity of guidance in respects to activities, in particular the type of activity that best suits patients with lymphedema. The influence of working pressure exerted at the skin-stocking interface during different activities and the joints involved affects the volume of lymphedema. [13-17]

Conclusion

It is possible to maintain the reduction in volume achieved by treating stage I lymphedema by combining the use of an elastic stocking and a low-stretch grosgrain stocking.

Conflict of Interest

All authors declare they have no have conflict interest and had no had financial support to perform this study.

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