

Pilot study on the treatment of lower limb lymphedema using grosgrain socks

Estudo-piloto no tratamento do linfedema de membros inferiores com meia de gorgurão

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ABSTRACT

Objective: the objective of this study was to evaluate lymphedema reduction in lower limbs using grosgrain socks (inelastic) as an isolated form of treatment. **Method:** 13 consecutive patients with lymphedema in the lower limbs treated with grosgrain socks were evaluated in prospective clinical assays for volumetry in the Godoy Clinic in 2012. There were five male and eight female patients, with ages ranging between 26 and 72 years and average of 49.0 years. The inclusion criterion was presenting grade II lymphedema in the lower limbs regardless of the cause; patients with a history of allergies and intolerance to containment mechanisms, infectious processes, joint immobility, and other causes that could interfere with the edema were excluded. The treatment used grosgrain socks, which are inelastic, custom made and closed through eyelets that allow adjustment by the patient. The volumetric technique was used to measure water-offset at the start and all follow-ups. The paired t-test was used for the statistical analysis considering a 5% alpha error. **Results:** the study was approved by the Research Ethics Committee. A significant reduction was detected in treated patients, two-tailed paired t-test with p.

Key words: Lymphedema; Lymphedema/therapy; Lymphedema/prevention & control; Lower Extremity.

RESUMO

Objetivo: o objetivo do presente estudo foi avaliar a redução do linfedema em membros inferiores utilizando meia de gorgurão (não elástica) como forma isolada de tratamento. **Método:** foram avaliados em ensaios clínicos prospectivos 13 pacientes consecutivos com linfedema em membros inferiores tratados com meia de gorgurão e avaliados pela volumetria na Clínica Godoy em 2012. Foram cinco do sexo masculino e oito do sexo feminino, com idades variando entre 26 e 72 anos, com média de 49,0 anos. O critério de inclusão foi ter linfedema grau II em membros inferiores, independentemente da causa; houve também a exclusão de pacientes com histórico de alergias e intolerância a mecanismos de contenção, processos infecciosos ativos, imobilidade articular e outras causas que pudessem interferir nos edemas em geral. O tratamento realizado foi a meia de gorgurão, que é inelástica, confeccionada sob medida, em que o fechamento é feito com ilhós e permite ajustamento pelo próprio paciente. Foi feita volumetria - técnica de mensura por deslocamento de água - no início e em todos os retornos. Para análise estatística foi utilizado o teste-t pareado, sendo considerado erro alfa de 5%. **Resultado:** o estudo foi aprovado pelo Comitê de Ética em Pesquisa. Detectou-se redução significativa nos pacientes tratados, teste t pareado bicaudal com p.

Palavras-chave: Linfedema; Linfedema/terapia; Linfedema/prevenção & controle; Extremidade Inferior.

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INTRODUCTION

Lymphedema is the accumulation of water, salts, electrolytes, high molecular weight proteins, and other elements in the interstitial space, resulting from dynamic or mechanical alterations in the lymphatic system, leading to a progressive increase in a limb or body region with a decrease of functional and immunological capacity, weight gain, and morphological alterations.¹ The combination of therapies such as manual and mechanical lymphatic drainage, mio-lymphokinetic exercises, restraining mechanisms, hygienic care, nutritional, and psychological are recommended in the treatment of lymphedema.²

The restraining mechanisms are the main form of therapy for lymphedema. However, they are always associated with muscle activity in order to have a synergistic effect in reducing edema, both venous and lymphatic.^{3,4} The main mechanism of action of socks is the potentization of the differential pressure in the venous and lymphatic systems.⁵ The decreasing compression in the elastic socks is another mechanism of fundamental importance in which the pressure applied can interfere with the effectiveness of treatment.⁵⁻⁷ Inelastic mechanisms are suggested in the treatment of lymphedema, however, there are difficulties in their development. The aim of this study was to evaluate the use of grosgrain socks (inelastic) as an isolated form of treatment in patients with lower limb lymphedema.

METHOD

Design

The reduction of lymphedema of the lower limbs was evaluated in a prospective clinical trial with 13 consecutive patients treated with grosgrain socks and evaluated through volumetry.

Casuistic and location

A total of 13 patients, five males, and eight females, aged between 26 and 72 years old, with a mean age of 49.0 years, at the Godoy Clinic in 2012.

Inclusion criteria

Included patients with lymphedema grade II in the lower limbs, independent of causes.

Exclusion criteria

Patients with a history of allergies and intolerance restraining mechanisms, active infectious processes, joint immobility, and other causes that could interfere with the edemas in general.

DEVELOPMENT

Thirteen consecutive patients with lymphedema grade II in bilateral lower limbs (26 limbs) were selected; a single therapy using grosgrain socks was indicated. The grosgrain is a custom made inelastic sock that closes through grommets. This type of closure allows the adjustment by the patient. The socks were controlled weekly when the need for adjustment by a professional was assessed. The evaluation of edema was made by volumetry – water displacement technique – on all follow-up appointments. The first, and last volumetry were taken as evaluation measurements during two months of follow-up. Approval by the Ethics Committee of the FAMERP - Opinion 172 286/2012.

STATISTICAL ANALYSIS

The paired t-test was used considering an alpha error of 5%.

RESULT

A significant reduction was observed in the treated patients, two-tailed paired t-test with $p < 0.007$. Figure 1 (box plot) shows volume variations during the treatment of lymphedema.

DISCUSSION

This study provides a new approach to the treatment of lymphedema of the lower limbs, which is the

grosgrain restraining sock used as a monotherapy in the treatment of lymphedema. Among the various therapies used, the restraining mechanism acts reducing the volume and maintaining results. What is observed in the lymphedema is the progression of edema without treatment with the use of this sock. The evolution of socks brings new contributions to the treatment of lymphedema; inelastic socks can improve the treatment's results. There are several studies using restraining grosgrain socks associated with other forms of lymphedema treatment that were effective in the acute reduction of edema volume and maintenance of resultados.⁸⁻¹⁰

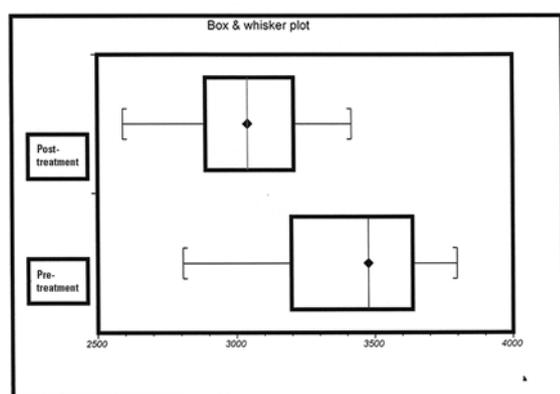


Figure 1 - Box whisker plot showing volumetric reduction in lymphedema of lower limb with grosgrain socks, post- and pre-treatment.

The grosgrain sock is custom made with polyester, polyamide, or cotton-associated fabric. The use of grommets in the form of adjusting laces allows the patient to keep the sock always adjusted. It is an inelastic sock, but the grosgrain fabric allows low extensibility in the transverse direction and good extensibility in the longitudinal direction, which provides the basic requirements for the restraining treatment of lymphedema.⁸⁻¹¹ The patient can wear or take it off easily for hygiene. On the other hand, it presents the same contraindications existing in restraining mechanisms (wraps/elastic socks), which are chronic arterial insufficiency, active infection, and allergic processes to the material. Thus, every patient, before starting its use, is evaluated and oriented to remove it immediately and seek professional advice if symptoms of pain or discomfort arise.

Muscular work is fundamental to the stimulation of the venous-lymphatic circulation in which the restraining socks provide external resistance generat-

ing wave of pulse similar to that performed by the muscular contraction venous return.⁵ However, if the sock is maladjusted, it will be same as not using it.

The control was performed weekly and scheduled according to the availability of patients. Whenever necessary, adjustments were made by a seamstress, being proportional to the loss of edema volume. Patients were instructed to check and adjust the sock several times a day. When the normalization of the limb edema occurred, the follow-ups began to be performed monthly.

The lack of adjustments may compromise the results. Volumetry was chosen in the evaluation because it is the gold standard bringing more reliability to the assessments. Adherence to treatment, and the work of a multidisciplinary team are other important aspects for the best results. The evaluation of joint mobility is crucial for the monitoring of these patients because it interferes with the pulse aspirative pumps.¹¹ However, the combination treatment is recommended in lymphedema.^{12,13}

CONCLUSION

A grosgrain sock is an isolated form of treatment of lymphedema.

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