

Lymph drainage in patients with joint immobility due to chronic ulcerated lesions

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Abstract

The fibrous process of chronic ulcerated lesions of lower limbs can impair the mobility of the affected limb. The aim of this work was to assess the benefits of lymph drainage in patients who suffer from this disease. Twenty female and five male patients with ages ranging from 53 to 69 years (mean age 60.6 years) were evaluated. All had a history of at least 10 years of varicose veins and/or ulcerated lesions of the lower limbs with initial dermatofibrosis, with the positive Godet sign during the physical examination of the limb. Patients with intermittent claudication, diabetes and trauma were excluded from the study, as well as patients with chronic dermatofibrosis, and in whom positive Godet sign was not seen. Patients with immobility or very limited movement of the ankle and with some limitation in the toe joints were selected. The patients were randomly divided into group A comprising 15 individuals, and group B 10. All the individual treatments were established before the start of the evaluation period. Lymph drainage was performed on the patients of group A four or five times per week. Group B was subjected to a type of massage for the same period and at the same frequency. The mobility of the ankle joints was evaluated using goniometry before the start and after 30 days of treatment. In all the patients who underwent lymph drainage, an improvement of the joint mobility was seen, whereas in the control, group B, there was no obvious change. In conclusion, lymph drainage gave an improvement in the mobility of the ankle joint after impairment due to initial dermatofibrosis in patients with chronic ulcerated lesions.

Keywords: Joint mobility; lymph drainage; chronic ulcerated lesions

Introduction

Contractile failure of the 'calf pump' causes an increase in the venous pressure, where the first effects of this venous hypertension appear in the subcutaneous veins and the capillaries of the skin.^{1,2} In the majority of cases, the pathophysiology of venous disease is still unclear. A failure of the vessel wall

leading to dilation and reflux, thereby causing venous hypertension, is the current hypothesis.

An increase in the permeability allows the exit of larger molecules provoking peri-capillary oedema and an increase in the fibrinogen in the lymph.²

Activated lymphocytes, thanks to the liberation of free radicals, injure the endothelium, and thereby increase the capillary permeability and increasing the inflammatory process. However, it is still necessary to elucidate if the lesion of the endothelium and perhaps of the interstitial space following the inflammatory process triggers the death of the tissue.²

The interstitial space acts as an interface between the blood vessels and the cells, and it suffers alterations due to the venous hypertension. The increase in the venous pressure and the capillary permeability increases the transudate flow in the

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interstitial space. Most of this transudate is eliminated by the lymphatic capillaries. Lymphatic capillaries, including those of the limbs of patients with primary venous diseases or after thrombosis, are normal; however, the small collectors in the skin and the suprapapillar plexus are abnormal in lipodermatosclerosis.³

In the advanced stages of chronic venous failure, the interstitial spaces contain all the elements of the inflammatory reaction: plasmatic proteins, leucocytes, haemocytes and hemosiderin,⁴ and most of the tissue was substituted by fibrosis.⁵ The aim of this work was to assess the benefits of lymph drainage in patients who suffer from this disease.

Materials and methods

In total, 20 female and five male patients with ages ranging from 53 to 69 years (mean age, 60.6 years) suffering from chronic ulcerated lesions were evaluated. All had a history of at least 10 years of varicose veins and/or ulcerated lesions of the lower limbs, cicatrized as C5 of the clinical, aetiological, anatomical and pathological elements (CEAP) classification when the tissue is still at the pitting stage; when pressed by the fingertips, the affected area indents and holds the indentation. Patients with intermittent claudication, diabetes and trauma were excluded from the study as well as patients with chronic intense fibrosis and in whom positive Godet sign (delay for the skin to return to normal after thumb pressure causes a depression) was not identified. Patients with immobility or very limited movement of the ankle and with some limitations in the toe joints were selected. The patients were randomly divided into group A comprising 15 individuals and group B comprising 10. All the individual treatments were established before the start of the evaluation period. Lymph drainage was performed four or five times per week on the patients of group A following the technique developed by the authors.^{5,6} Group B was subjected to a type of massage (regional compression of the muscles) for the same period and at the same frequency. The mobility of the joints was evaluated using goniometry, a standardized routine evaluation performed before the start of the study and after 30 days of treatment.

For statistical analysis, an unpaired *t*-test was used accepting an error α of 5%.

Results

There was a significant improvement in the mobility of the joints in all of the patients treated using

Table 1 Show range of motion before and after treatment in the groups

Patient	Treatment			Control		
	Before	After	Difference	Before	After	Difference
1	21°	21°	10°	23°	25°	2°
2	22°	30°	8°	19°	20°	1°
3	16°	22°	6°	31°	35°	4°
4	24°	31°	7°	22°	23°	1°
5	14°	19°	5°	18°	17°	1°
6	27°	35°	8°	21°	22°	2°
7	23°	32°	9°	24°	26°	2°
8	18°	24°	6°	24°	26°	2°
9	26°	36°	10°	32°	35°	3°
10	24°	32°	8°	19°	19°	0°
11	17°	23°	6°			
12	20°	27°	7°			
13	22°	30°	8°			
14	26°	35°	9°			
15	19°	26°	7°			

lymph drainage of between 5 and 10 degrees in relation to a control group ($P < 0.0001$, Table 1). In the control group B, who only had massage, no real improvement was seen.

The mobility of the pododactyl joints was not measured, but was clinically evaluated and was the first to present an improvement in all of the individuals who underwent lymph drainage.

Discussion

The lymph drainage that was orientated, supervised and observed by a physician proved to be efficient in improving the flexibility of patients' joint immobility and chronic ulcerated lesions. The number of weekly sessions seems to affect the results. At first we dealt with five groups of three patients; each group underwent one to five sessions per week. The results of this preliminary trial suggested that one session per week was insufficient due to the delay, and therefore the effectiveness in relation to the results. Five sessions per week proved to be much more efficient. Owing to these initial results, this was the obvious choice for this study.

Patients with chronic dermatofibrosis show slower results; therefore patients who suffered from initial dermatofibrosis and oedema, specifically when the region of the Achilles' tendon was affected, were selected to participate in this study. This suggests that the same result cannot be expected in the stages where the normal tissue has been substituted by fibrous tissue at a higher rate.

The patients reported improvement in the pododactyl joints first and these alterations could be observed from the fifth session.

The principal function of the lymphatic system is to remove proteins. In the treatment of lymphoedema, it is possible to achieve good improvements with lymph drainage.⁷ This can also be seen in patients with dermatofibrosis caused by chronic venous insufficiency.

The accumulation of proteins in the interstitial space associated with excessive inflammatory stimuli, for instance, leakage of haemocytes that is common in these patients, can contribute to the aggravation of the fibrous symptoms. Patients with deep vein thrombosis normally do not present the same difficulties of scarring of their wounds in the initial phases of the evolution to dermatosclerosis.

The removal of the proteins of the subcutaneous tissue helps in the evolution of the chronic venous insufficiency. The improvement in the joint mobility allows an improvement in the venous return.

Conclusion

Lymph drainage, four or five times weekly meticulously evaluated and followed by the physician, can

improve the joint mobility in patients with limitations caused by chronic venous insufficiency.

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