

LPG[®] Technique in the Treatment of Peripheral Lymphedema: Clinical Preliminary Results and Perspectives

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INTRODUCTION

Lymphedema is a chronic worsening disease with progressive appearance of fibrosis in the interstitial tissue involving dermal and hypodermal layers.

LPG technique supplies a sort of standardized massage procedure by means of two moving rollers, shifting over the skin. This method creates a kind of traction on the tissue together with an aspiration effect, that can be continuous or intermittent. The mechanical action on the skin represents a stimulation on the most superficial layers allowing to soften fibrosis.

We tried to use LPG technique to reduce fibrosis in lymphedemas at advanced stages, from the 3rd to 5th, after treating them by combining complex decongestive physical therapies and microsurgical operation.

MATERIALS AND METHODS

We performed a prospective study in twenty patients affected from secondary lymphedema of arms (12) and legs (8) treated by combining physical therapies and microsurgical operations. After a period variable from 1 to 3 months from microsurgery, patients underwent a standardized protocol of therapy by LPG technique to cure the remaining less responsive fibrosis. We used Cell M6-IP device.

The protocol of therapy by LPG consisted in a treatment of 25 minutes, 3 times a week, for 5 weeks.

The results were assessed by photographs, volumetric measurements, US, lymphoscintigraphy, MR and Laser-Doppler.

RESULTS

By comparing photographs before and after LPG treatment, we could notice an evident improvement in terms of reduction in size of the treated part of the limb.

Volumetric measurements showed a decrease of excess volume from 5% to 10% after LPG therapy.

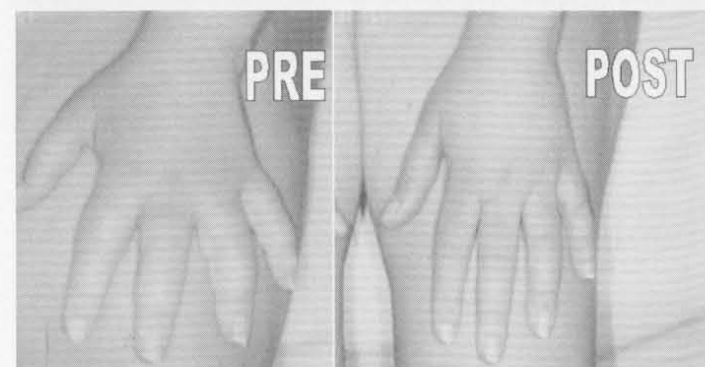
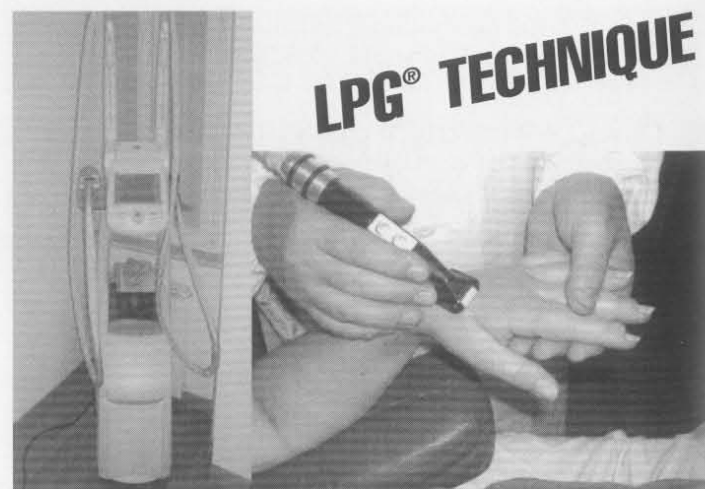
Ultrasounds allowed to obtain a better assessment of fibrosis of tissues and follow results obtained by LPG treatment. Echo-

scanning performed by the same operator demonstrated a significant reduction of fibrosis together with a consequent decrease of the thickness of superficial layers after LPG therapy.

Lymphoscintigraphy showed a reduction of dermal back flow at the site of fibrosis after treating the area by LPG technique.

MR proved to be useful to assess the reduction of fibrosis but is too expensive to be performed routinely.

Laser-Doppler evaluated perfusion of blood microcirculation of superficial tissues and showed a significant improvement of perfusion after LPG treatment of fibrosis.



DISCUSSION AND CONCLUSIONS

Lymphedema is assumed to increase in amount and stage with time. These increases together with that of fibrosis were caused mostly by duration rather than by patient aging¹.

Due to pathophysiological changes that occur in chronic extremity lymphedema, fibrosis progressively appear, resulting also from overexpressions of relevant genes like TGF-beta in the dermal and subcutaneous tissue fibroblasts and subsequent extracellular matrixes syntheses and deposition.

Thus, patients should be persuaded to undergo treatment early, starting with complex physical therapies for 2 intensive weeks of treatment. If after 3-6 months there is the relapse or worsening of lymphedema, notwithstanding proper elastic support (stockings, sleeves, etc.) another cycle of therapy of other 2 weeks is performed. If after 3-6 months after this second treatment lymphedema relapse or increases it is recommended to refer to microsurgical operations, in order to create new pathways of drainage of lymph. This way, the appearance of fibrosis is prevented or at least reduced at the utmost². For those cases addressed to this kind of combined treatment physical and microsurgical late, at the most advanced stages, with a lot of fibrosis already present, LPG technique proved to be extremely useful to greatly reduce and soften fibrosis.

Lymphedema is characterized by complications consisting of infections followed by fibrosis and occlusion of the collecting lymphatic vessels. Lymphedema is worsened by fibrosis.

Manual lymph drainage, through a constant change in pressure, moves fluid in the skin, increases lymphomotricity and softens fibrosis³. But, often fibrosis is not enough responsive to this kind of physical therapy, also if associated with compression, and

requires some other method of treatment.

Microsurgery offers valid solutions in allowing the drainage of the obstructed lymph flow by carrying out lymphatic-venous shunts⁴ or by reconstructing lymphatic-pathways where obstructed by means of autologous venous grafts interposed between lymphatic collectors above and below the obstacle to lymph circulation⁵. This drainage, if applied precociously, can prevent the formation of fibrosis and the progressive evolution of extremity lymphedemas. Unfortunately, several patients are addressed to microsurgical solutions lately when fibrosis is present at a certain amount.

In these cases, LPG technique helped us in reducing fibrotic tissural component, allowing to softening skin and superficial tissues, further improving lymphatic drainage of the affected limb.

As concerns the objective assessment of fibrosis, among different clinical and instrumental criteria, we think that ultrasounds can show better the amount of reduction of fibrosis in lymphedematous tissues from the morphological point of view. Lymphoscintigraphy is useful to evaluate the functional improvement of the drainage of lymph at the areas of fibrosis (reduction of dermal back flow)⁶. Laser-Doppler gives precise information on the benefit effects of the therapy on blood microcirculation and thus is considered an indirect sign of decrease of fibrotic component of tissues.

In conclusion, in our preliminary clinical experience, LPG technique showed to be a valid method to reduce and soften fibrosis in chronic extremity lymphedemas after reducing edema volume by physical therapies associated to microsurgery.

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