Available online at **www.ijmrhs.com**

ISSN No: 2319-5886

International Journal of Medical Research & Health Sciences, 2019, 8(9): 25-27

Evolution of Lymphedema in an Obese Diabetic Patient Using Grosgrain Stockings as Monotherapy

Jose Maria Pereira de Godoy[1]*, Lívia Maria Pereira de Godoy[2], Ana Carolina Pereira de Godoy[3] and Maria de Fatima Guerreiro Godoy[4]

[1] Cardiology and Cardiovascular Surgery, Department of the Medicine School in São José do Rio Preto (FAMERP), CNPq, Brazil

[2] Group of the Clínica Godoy, São José do Rio Preto, Brazil

[3] Pediatrics Unit Intensive Therapy of Santa Casa de São Paulo, Brazil and Research Group of Clínica Godoy, São Jose do Rio Preto, Brazil

[4] Medicine School in São José do Rio Preto (FAMERP) and Research Group in Clínica Godoy, Sao Jose do Rio Preto, Brazil

**Corresponding e-mail: godoyjmp@gmail.com*

ABSTRACT

The objective of this study was to show the evolution of lymphedema in an obese diabetic patient using grosgrain stockings as monotherapy. A 51-year-old obese male with diabetes since childhood did not perform adequate control of the condition, progressing to vision loss and diabetic neuropathy. About 10 years ago, he began to have edema in the left leg, which progressed. Therefore, bioimpedance analysis was used, which demonstrated generalized lymphedema. The use of compression stockings made of grosgrain fabric was proposed to which the patient presented good tolerability for 1 year. At one of the evaluations, the generalized edema had returned but subsequently improved again. However, the lymphedema of the trunk and lower limbs remained, despite the weight loss. Systemic clinical lymphedema evaluated by electrical bioimpedance analysis was reduced with the weight loss of the patient throughout treatment.

Keywords: Evolution, Lymphedema, Obese, Diabetic patient, Treatment, Grosgrain stockings, Monotherapy

INTRODUCTION

Lymphedema is a clinical condition in which macromolecules accumulate in the interstitial space, leading to the retention of liquids in this space as well as in the cells. The condition may be congenital or acquired, is normally progressive and there is no cure, but treatment can bring the affected limb within or close to the range of normality [1-3]. The diagnosis is clinical, but complementary exams can be performed when necessary. The diagnosis is confirmed by measurements of volume (volumetry using the water displacement technique and determination of circumferences) and electrical bioimpedance analysis. Lymphoscintigraphy is an exam that evaluates aspects of the anatomy of the vessels and can reveal reflux and the retention of macromolecules [1,2]. Bioimpedance analysis is a diagnostic tool used to determine the amount of water in the entire body, limbs, and trunk. This non-invasive method enables the follow up of patients by offering information on the redistribution of bodily liquids with treatment [4].

In animal models, an increase in weight is associated with several changes, including a reduction in the pumping mechanism of lymphatic vessels, the inflammatory process and changes in capillary permeability [5]. Studies evaluating the redistribution of liquids in obese human subjects with the aid of bioimpedance analysis have detected an initial increase in intracellular and extracellular water beyond the limits of normality in the limbs and thorax without characterizing clinical lymphedema. This progresses to lymphedema, which initiates in the lower limbs, then passes to the trunk and finally the upper limbs [6]. The objective of this study was to show the evolution of lymphedema in an obese diabetic patient using grosgrain stockings as monotherapy.

Case Report

A 51-year-old obese male with diabetes since childhood did not perform adequate control of the condition, progressing to vision loss and diabetic neuropathy. About 10 years ago, he began to have edema in the left leg, which progressed. Four years ago, the patient sought a clinic for specialized treatment. The initial evaluation revealed clinical lymphedema. Volumetry was not performed due to the patient's limitations. Therefore, bioimpedance analysis was used, which demonstrated generalized lymphedema, with intracellular and extracellular water beyond the limits of normality in the limbs and trunk (Table 1).

Table 1 Changes in intracellular and extracellular body liquids in limbs and trunk

	2014	2014	2014	2015	2016	2017	2018	2019	Normal water	TEW/TBW
Total intracellular water		26.3	26.3	25.3	22.1	21.6	20.4	21.4	16.9-20.7	
Total extracellular water	20.7	18.9	18.4	17.4	15.3	15.4	13.6	14	10.4-12.6	
TEW/TBW	0.427	0.418	0.412	0.406	0.408	0.415	0.401	0.397	0.36-0.39	
BMI	42.2	40.8	39.5	38.8	32.3	32.1	32.1	33.4		
Body weight	117.8	113.8	110.1	108.5	90.1	89.5	89.5	93.1		
Right arm	0.39	0.381	0.382	0.391	0.382	0.39	0.382	0.379	1.39-1.69	0.384 limit (0.36-0.39)
Left arm	0.395	0.386	0.391	0.39	0.385	0.388	0.379	0.38	1.39-1.695	0.388 limit (0.36-0.39)
Trunk	0.421	0.413	0.409	0.405	0.408	0.415	0.401	0.398	12.6-15.4	0.399 limit (0.36-0.39)
Right leg	0.418	0.405	0.409	0.398	0.406	0.416	0.396	0.393	4.37-5.35	0.399 limit (0.36-0.39)
Left leg	0.456	0.47	0.433	0.433	0.427	0.425	0.416	0.411	4.37-5.35	0.419 limit (0.36-0.39)

The use of compression stockings made of grosgrain fabric was proposed, to which the patient presented good tolerability for 1 year. However, he had lost sensitivity in the feet, and the use of the stocking began to become problematic. When the stocking was folded over, it caused trauma that the patient did not perceive due to the loss of sensitivity.

The limbs in this phase were without clinical edema, but with the diagnosis determined by bioimpedance. In the 4 years of follow up, the patient lost weight and the edema continually diminished. At one point, he regained weight but subsequently lost it again. The systemic clinical lymphedema evaluated by bioimpedance improved with weight loss. At one of the evaluations, the generalized edema had returned but subsequently improved again. However, the lymphedema of the trunk and lower limbs remained, despite the weight loss.

DISCUSSION

The present study shows the change in body liquid during treatment for lymphedema using grosgrain stockings. Generalized systemic lymphedema was diagnosed on the first evaluation using electrical bioimpedance analysis. Throughout the course of the treatment for lymphedema with grosgrain stockings and weight loss, a reduction in edema occurred in the limbs and trunk with the reductions in total intracellular and extracellular water. Bioimpedance analysis revealed that the reduction in the upper limbs reached the range of normality. In contrast, the reductions in the lower limbs and trunk did not reach normalization.

Systemic lymphedema (diagnosed by bioimpedance analysis) has been detected in obese patients with a high BMI, generally higher than 60 kg/m^2. However, the condition was detected in the present case in a patient with a BMI of 42.2 kg/m^2. With weight loss, a considerable reduction in systemic lymphedema occurred. However, lymphedema is generally more significant in the lower limbs in such patients, likely due to the effect of gravitational pressure.

In animal models, an increase in weight is associated with the inflammatory process as well as changes in the pumping mechanism of lymphatic vessels and capillary permeability [5]. Studies involving humans have shown that subclinical systemic lymphedema progresses to systemic lymphedema diagnosed by bioimpedance, which initiates in the lower limbs, then passes to the trunk and finally the upper limbs [6]. Such findings point to a new line of research that enables gaining a better understanding of the evolution of edema in obesity.

CONCLUSION

Systemic clinical lymphedema evaluated by electrical bioimpedance analysis was reduced with the weight loss of the patient throughout treatment.

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

[1] Pereira, JM De Godoy, et al. "Intensive outpatient treatment of elephantiasis." *International Union of Angiology,* Vol. 31, No. 5, 2012, pp. 494-99.

[2] Lee, B. B., et al. "IUA-ISVI consensus for diagnosis guideline of chronic lymphedema of the limbs." *International Union of Angiology*, Vol. 34, No. 4, 2015, pp. 311-32.

[3] Pereira, JM De Godoy, et al. "Lymphedema in patients in different BMI ranges and therapeutic response to intensive treatment." *International Journal of Medical Science and Diagnosis Research,* Vol. 2, No. 6, 2018, pp. 11-18.

[4] Asklof, Madeleine, et al. "Bioelectrical impedance analysis; a new method to evaluate lymphoedema, fluid status, and tissue damage after gynaecological surgery-A systematic review." *European Journal of Obstetrics and Gynecology and Reproductive Biology*, Vol. 228, 2018, pp. 111-19.

[5] Nitti, Matthew D., et al. "Obesity-induced lymphatic dysfunction is reversible with weight loss." *The Journal of Physiology*, Vol. 594, No. 23, 2016, pp. 7073-87.

[6] Pereira de Godoy, Jose Maria, et al. "Bariatric surgery and the evaluation of subclinical systemic lymphedema." *Journal of Surgical Case Reports*, Vol. 2, 2019, pp. 1-3.