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RESEARCH ARTICLE

EFFECT OF SHOCKWAVES ON FACIAL FLACCIDITY EVALUATED BY ELASTOGRAPHY

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Abstract

Shock wave therapy (OCD) presents itself as a resource recently used for aesthetic purposes, due to its ability to activate tissue remodeling processes. This research was characterized as a randomized controlled clinical trial, carried out with 2 female participants, whose main complaint was the flaccidity of the face. The parameters used were: 4 applications, each with 2500 pulses, frequency 17 Hz and intensity 2.5 Bar. The study ended up observing that shock wave therapy is recommended for the treatment of facial flaccidity.

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Introduction:-

Shockwave therapy (OCD) is a resource that has been recently used for aesthetic purposes because of its ability to activate tissue remodelling processes through the stimulation of cells that act directly in the repair process (Frairia and Berta, 2012).

Among the responses expected from the use of this device on the skin we highlight an important stimulus to neovascularization, with the release of nitric oxide and growth factors, favouring a biochemical response that activates the collagen production process, improving nutrition and cutaneous appearance (Carvalho et al., 2011).

Christ et al. (2008) report that ultrasound examinations showed the increase in firmness and density of collagen and elastic fibres of the dermis and hypodermis with the use of shockwaves. Elastography is a newly developed ultrasound technique used in several medical specialties, which provides information on the physical properties of tissues in physiological and pathological processes. This study sought to evaluate the possible effects of the application of shockwaves on facial flaccidity using ultrasonography and elastography.

Case Report

The research is characterized as a randomized controlled clinical trial, conducted with 2 female participants with sagging face.

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The study was approved by the Ethics Committee (Approval No. 3,033,733). A radiologist doctor performed the ultrasonography examination of the patients' facial region (left and right nasogenian groove and submental region). The examination evaluated the thickness of the epidermis, dermis and hypodermis, and was performed in 2 stages: prior to application, and 15 days after the last session. The parameters were: 4 applications, each of 2500 pulses per hemicara (nasogenian groove + submental zone, on the same side) at a frequency of 17Hz and intensity of 2.5 Bar.

Case 01:

Volunteer B.V., 56, filed a complaint of facial flaccidity, started treatment on 08/12/17 and ended on 09/29/17.

Table 01:- Ultrasound values before and after treatment.

	Submentonian		RNG		LNG	
Epidermis	0.51	0.88	0.51	0.94	0.48	0.62
Dermis	0.70	1.07	0.85	1.54	0.51	0.76
Hypodermis	0.79	1.25	1.20	1.35	0.94	1.17

RNG: right nasogenian groove. LNG: left nasogenian groove

The colour scale represents the stiffness of all tissues within the region of interest (red = hard tissue, blue = soft tissue)(Christ et al., 2008).

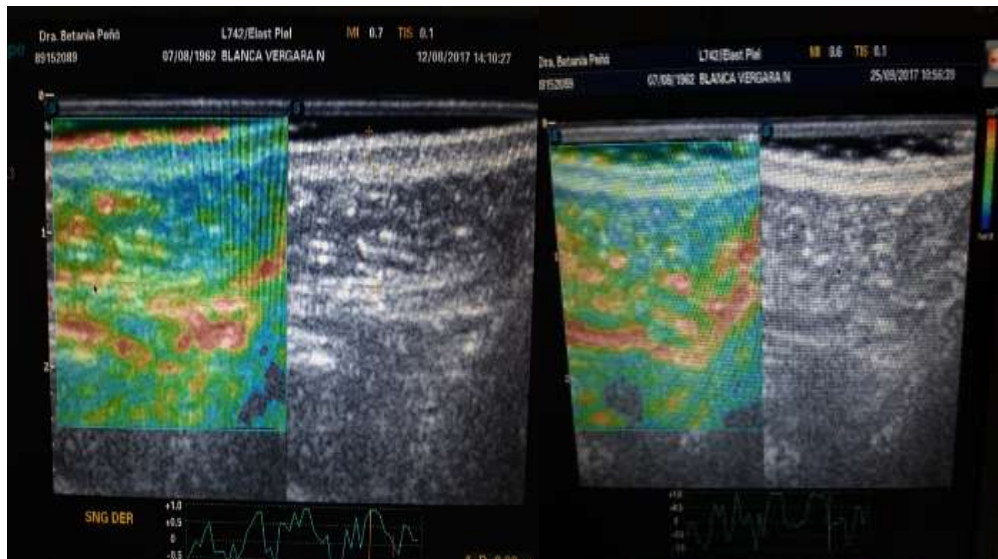


Figure 01:- Images before treatment and 15 days after the last application (submental region).

Case 02:

Volunteer C.S., 50, filed a complaint of facial flaccidity. The treatment began on 08/25/17 and ended on 09/25/17.

Table 02:- Ultrasound values before treatment and 15 days later:

	Submentonian		RNG		LNG	
Epidermis	0.62	0.77	0.60	0.76	0.68	1.02
Dermis	0.57	0.68	0.68	0.97	0.77	1.15
Hypodermis	0.59	0.97	1.01	1.15	1.05	1,32

RNG: right nasogenian groove. LNG: left nasogeniangroove

The elastography presented changes comparing the before and after treatment regarding the red zone, which appears larger after the treatment.

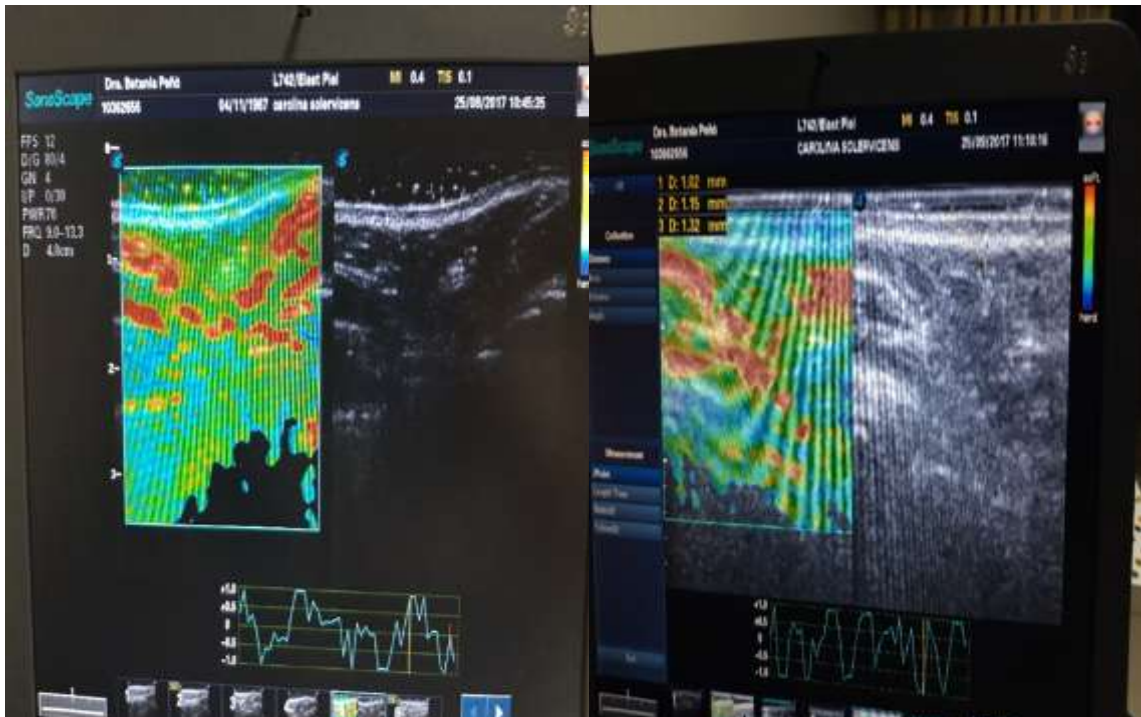


Figure 02:- Images before and 15 days after the last application (left nasogenian groove).

Discussion:-

According to Morais et al. (2018), shockwave therapy has been studied extensively because of its multiple biological properties and has served as an alternative treatment for tissue conditions, including sagging skin.

This study has observed that tissue thickness increased in all layers, corroborating with Morais et al. (2018), which shows that after the application of shockwaves there was an increase in growth factors, observed by histochemical immunoassay, with dermis thickness growth, indicating that neocollagenesis was cumulative and dose-dependent. Adatto et al. (2011), with the same equipment and ultrasonographic analysis, indicated a reduction of the subcutaneous fat layer after six applications. Nassar et al. (2015) found induction of lipolysis and / or apoptosis of the adipose cell.

Through elastography, it was observed that there was an increase in red coloration, indicating a firmer tissue, corroborating with the study by Morais et al. (2018), which suggests the mechanotransduction mechanism as a more effective route than inflammation for the organization of collagen tissue when the mechanical stimulus of OCD is used to stimulate tissue plasticity.

Thus, it is understood that the shockwaves were able to make the tissue more rigid, evidencing its tissue repair acceleration property, exerting direct influence on skin conditions, such as sagging facial skin.

It is important to note that the parameters used for the treatment of flaccidity in this study and for adipose tissue in other investigations cited in the literature were not the same.

This study was conducted under limitations of small sample and lack of a quantification of the elastography test results, but since this is a first study of the application of shockwave therapy on the face, we seek motivation to continue this study in the future.

Conclusion:-

Shockwave therapy is recommended for the treatment of sagging facial skin.

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