

CONJUGATION THERAPY FOR TREATMENT OF FACIAL AGING. USE OF POLYDIOXANONE THREADS AND BIOIDENTICAL HORMONAL REPLACEMENT WITH SUBSTANCES NANOSTRUCTURED TRANSDERMAL VIA

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Abstract: The theme of this work is nanotechnology alternatives to combat facial aging. The clinical application of polydioxanone threads (PDO) is a minimally invasive technique that aims to reposition loose facial tissue with the aim of promoting facial rejuvenation by stimulating the formation of collagen fibers. This type of technique is highly sought after by women of all ages but, above all, by those in post-menopausal conditions, a physiological situation characterized by a sharp decline in hormonal levels and a greater loss of tissue elasticity and facial sagging. The constant use of contraceptive drugs, with a chemical structure that differs from natural hormones, and the use of other drugs, such as antidepressants, can worsen the general health of these patients, accentuating problems that lead to facial aging. The replacement of bioidentical nanostructured steroid hormones is very important for the formation and maintenance of collagen fibers in tissues. Objective: in this study we describe the treatment carried out on a perimenopausal patient with loss of tissue elasticity and marked sagging of facial tissues using PDO threads in conjunction with replacement with bioidentical hormones developed by nanotechnology. The transdermal absorption of these hormones was intensified through a nanostructured vehicle developed from oxygen liposomes (lipO2). The patient underwent Nanostructured Bioidentical Hormone Replacement Therapy (TRHBN) and received facial harmonization treatment with the insertion of smooth, conical and barbed PDO threads. Result: Within 30 months, a significant reduction in facial expression wrinkles and an increase in facial skin elasticity were observed, making it possible to observe a decrease in tissue sagging. Conclusion: Facial harmonization treatment using PDO threads in conjunction with nanostructured bioidentical hormone

replacement therapy is a promising facial rejuvenation therapy.

Keywords: Aging. Facial harmonization. Bioidentical hormones. Polydioxanone. Nanotechnology.

INTRODUCTION

Polydioxanone thread (PDO) is a surgical fiber obtained by the polymerization of paradioxanone monomers. From a molecular point of view, it has the following formula: $C_4H_6O_3$. PDO threads are commonly used in facial rejuvenation processes through collagen biostimulation. Facial lifting with threads is a minimally invasive surgical technique for facial rejuvenation that has been increasingly sought after in clinics due to its anti-aging results. It is known that skin aging is directly associated with a decrease in the production of progesterone and estrogens (1). Its incidence is also seen in patients with low testosterone levels, being an important regulator of bone metabolism, especially in patients diagnosed with osteoporosis (2).

Facial aging is a degenerative process that damages the contour and angular prominence, generating an appearance of tiredness and sadness in the facial appearance (3). The decline in estradiol levels after menopause is associated with a dramatic reduction in skin health and well-being, negatively impacting dermal cellular and homeostatic mechanisms, as well as other important biological functions. Additionally, changes include loss of collagen, elastin, fibroblast functions, vascularization, and increased enzymatic activities of matrix metalloproteinases, resulting in cellular and extracellular degradation that leads to dryness, wrinkles, atrophy, impaired healing, barrier function, decreased antioxidant capacity, decreased attractiveness and psychological health, and increased perception of aging (4).

In Brazil, with the approval of Federal Law No. 9965/2000, which ratifies the prerogative

of prescribing anabolic steroids and peptides by dental surgeons, a new look is launched on how mucous membranes communicate with systemic pathways and how any process inflammation in the body has repercussions on other sites in the human body (5).

The present study aims to describe the benefits of the treatment carried out on a perimenopausal patient, with loss of tissue elasticity and marked sagging of facial tissues, with the use of PDO threads in conjunction with replacement with bioidentical hormones developed by nanotechnology. And prove that this combined treatment can enhance the effects of facial rejuvenation, improve inflammatory parameters and provide greater longevity and quality of life for the patient.

REPORT OF CASE

The patient, a 41-year-old female, sought facial aesthetic treatment at a dental office, with her main complaint being facial aging with the presence of wrinkles and a tired appearance. An anamnesis was carried out to check their oral conditions and general health. In the anamnesis, the patient reported having the following main symptoms: xerostomia, depression, fatigue, skin redness, low immunity, vaginal fungal infections, rhinitis, heavy menstrual flow, swelling, gum retraction, low libido, irritability and premenstrual tension. Furthermore, she presented several episodes that ranged from fear, anxiety, aggression and depression, without a satisfactory response to the prescribed allopathic therapy. Furthermore, she used Escitalopram Oxalate 10mg and Donaren Retard 50mg to treat insomnia and anxiety attacks.

Previously, at the age of 39, he had started a treatment with PDO threads for facial rejuvenation in which, on each side of the face, 5 barbed threads USP 0.0 21G cannula (MEDITHREAD) were used with the All On

Five technique, in the skin procedure flaccid nasolabial folds, in the marionette line, 2 nose threads and several smooth threads for collagen biostimulation on the face and neck. Her results were not as satisfactory as expected and it was assumed that this was due to the low quality of life and interference of allopathic medications and clinical weaknesses that the patient reported. (Figure 2A)

Given her weakened clinical situation and low quality of life, when she returned to the office after 2 years, at the age of 41, new serum tests were requested. In the analysis of their exams, it was noted that the inflammatory parameters were well above normal parameters and the anti-inflammatory parameters below, as we can see in Table 1. As a result, a new treatment proposal was made with the combination of the aesthetic part of facial harmonization and hormonal replacement, using nanostructured bioidentical hormones (Lab. Buenos Ayres São Paulo/SP). This time, the procedures were performed using PDO wires used on each side of the face, 5 USP barbed wires 2 18G cannula (MEDITHREAD) with the All on Five technique, USP 2 conical 18G cannula and modified Extreme Neck technique (Figure 2B).

In May 2022, after 4 months of facial harmonization procedures carried out and the continuous use solely and exclusively of nanostructured bioidentical hormones, without the allopathic drugs that the patient was taking, the signs and symptoms decreased considerably and the aesthetic results advanced significantly, as demonstrated in figures 2A and 2B. Data from the present study showed that the use of nanostructured bioidentical hormones increased the longevity-extending effect of implant patterns in retention lifting with PDO.

In a second analysis of their serum tests, 8 months after starting TRHBN, we obtained a considerable increase in steroid levels (natural

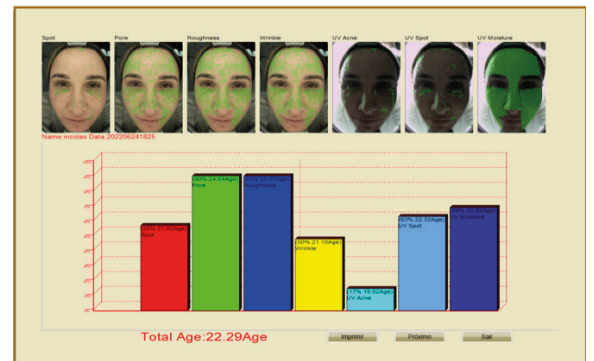
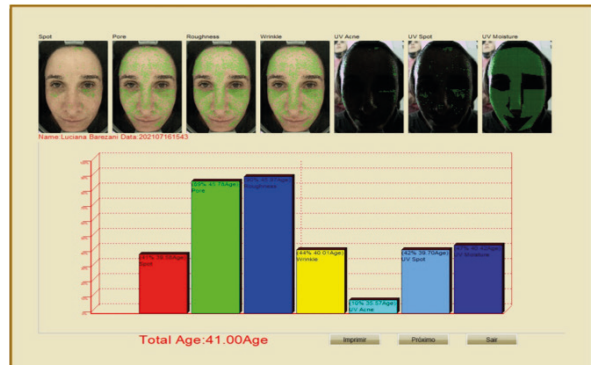
anti-inflammatories) and a decrease in inflammatory parameters (Table 1). Contrary to prevailing opinion, the patient reported a substantial improvement in her quality of life and her dental problems, without any side effects such as masculinization of the body.

Regarding hormone replacement with transdermal bioidentical hormones, the following dosages were administered: testosterone 75mg/g; progesterone 100 mg/g; estradiol 5 mg; 10mg estriol; cholecalciferol 50,000IU, vitamin A 5000 IU and vitamin K2MK7 120 mcg. In addition to practicing daily physical activities. As a result, upon reaching 6 months of treatment, the patient, who weighed 64 kg, reached 63 kg, with a significant increase in lean mass. No complications were reported and the patient presented an excellent evolution from her initial clinical health condition with a significant improvement in her skin conditions 6 months after starting the replacement.

The improvement in several of the facial aesthetic standards was observed, through the analysis generated by the FACEBOX PRO Machine, which reproduces standardized photographs of the face with “natural” light and ultraviolet light and quantification through graphs of the various variables: facial wrinkles, size of pores, “blemishes”, acne, etc.). In fact, the measurements carried out revealed a reduction in the biological age of the skin, from 41 years to 22 years (Figures 3A and 3B).



Figures 2A and 2B. Photographs of the patient’s face: Before and After the treatment performed



Figures 3A and 3B. Digital Photographs and Before (2021) and After (2022) Graphics generated by the FACEBOX PRO Machine. (Standardized photographs of the face with “natural” light and ultraviolet light and quantification through graphs of the different variables: facial wrinkles, pore size, “blemishes”, acne, etc.)

	PRE THERAPY (11/2020)	POST THERAPY (07/2021)
Age (years)	41	43
Weight (Kg)	6	6
Testosterone (ng/dL)	1	259
Estradiol (pg/mL)	50	81
Progesterone (ng/mL)	0,21	0,46
Vitamin D (ng/mL)	34,3	264,4
TGO (U/L)	18	25
TGP (U/L)	19	22
Homocysteine (micromol/L)	15,11	12,09
Fibrinogen (mg/dL)	24	21
Triglycerides (mg/dL)	8	5
TSH (microUI/mL)	1,09	0,5
PCRus (mg/L)	1,22	0,85

Table 1. Serum hormonal levels and inflammatory parameters before and after 8 months of transdermal bioidentical hormone replacement.

ANALYSIS AND DISCUSSION

There are several reports in the literature that cite hormonal deficiencies directly related to depression versus quality of life, low immunity, xerostomia (loss of saliva production capacity), various allergies, asthma, heavy menstrual flow, premenstrual tension, gum retraction and, finally, skin aging (6, 7, 8, 9, 10, 11).

The degree of skin aging is determined by genetic (intrinsic) and exogenous (extrinsic) factors. Typical characteristics of facial aging include not only the degeneration of subcutaneous fat in the middle third of the face, but also typical intrinsic and extrinsic signs of aging, such as loss of elasticity and wrinkling of the face (12). Tissue flaccidity is associated with several chronic inflammatory processes. Chronic overload of the body's own detoxification mechanisms, caused by cumulative oxidative stress, leads to prolonged aging. An important role in this process is played by the interaction of fibroblasts and the fiber network, which exerts a strong attraction between them. According to Sattler & Gout (2017), with increased fragmentation of this fiber network, fibroblasts lose their function, which directly leads to a decrease in the force exerted on them. This opens up possibilities for using interventional approaches to improve this coupling, such as the insertion of Polydioxanone threads, reported in this present study. And when this procedure was carried out concomitantly with nanostructured bioidentical hormonal modulation, the result was even better, see Figures 2A, 2B, 3A and 3B.

Recent articles show that hormone replacement regulates calcium transport and reduces the severity of the inflammatory process (13). Some studies have shown that after hormone replacement there was an improvement in the preservation of bone loss (13). Bioidentical steroid hormone

replacement is considered a safe and effective therapy in the treatment of hormonal declines, especially in perimenopausal women, as well as in the control of chronic inflammation (14). The decrease in hormone production and lack of hormone replacement have been associated with increased degeneration of subcutaneous fat in the middle third of the face (12).

Replacement with bioidentical hormones regulates several physiological processes in the body, being essential for human health and a better quality of life. The patient who underwent dental treatment concomitantly with facial harmonization with PDO threads, agreed to undergo nano hormone replacement therapy, in order to improve the longevity of the lifting retainers with polydioxanone (PDO). And as a result, she achieved a better quality of life, restoring her self-esteem.

Along with stimulating collagen, increasing dermal thickness and proliferation of fibroblasts promoted by polydioxanone (PDO) threads (15), estradiol is also shown to be one of the main responsible for stimulating collagen and elastin, improving the function of fibroblasts (4), sagging, hydration and facial contour as seen in Figure 2B. It is also possible to highlight that testosterone promotes increased collagen synthesis and maintains muscle tone (16); while progesterone increases the expression of vascular endothelial growth factor (VEGF), inhibits inflammation and increases the activity of superoxide dismutase (SOD) (17). For these reasons, the authors believe that the present work provides strong evidence of the role of steroids as anti-inflammatories, acting effectively in the aging process.

CONCLUSIONS

The data from the present study show that the use of transdermal bioidentical hormones with nanoparticles indicated for HOF suggested an increase in the useful life of the threads when associated with procedures with lifting retainers with polydioxanone (PDO), significantly increasing the quality of the skin such as wrinkles facial features, pore size, blemishes, as well as muscle tone and thickness of the dermis and epidermis.

Furthermore, it brought a better quality of life to the patient by removing allopathic drugs. However, more studies are needed to reaffirm these findings.

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