
Original Article

Palpebral Skin Bio-Restructuring

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Abstract

Restructuring treatment to reverse aging of the periorbital region is one of the challenges faced by plastic surgeons. Although there is no single treatment for different skin types, it is nonetheless important to evaluate which treatments are most suitable. Our study compares amino acids injection treatments with treatments combining percutaneously injected dermaroller and amino acids. We considered parameters like patient's discomfort during treatment and post-treatment satisfaction. Such data were analyzed with the Students' t-test. Infiltration with amino acids proved to be more effective in the long term than the combined approach.

Keywords

Eyelid, aging, mechanical stimulus, chemical stimulus

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Introduction

The periorbital region includes lower and upper eyelid and the external area formed by zygomatic and frontal bone structures. This region is frequently affected by early signs of aging, often requiring intervention in order to improve wrinkles, abnormal pigmentation, skin relaxation, and brow ptosis, albeit, without altering the facial expression¹. In order to determine the best treatment, it is necessary to define a global approach to the affected area, since most aesthetic defects are often associated. There are two approaches; on the one hand, the surgical route (lower blepharoplasty, upper blepharoplasty, eyebrow lifting and cantopexy, cheekbone lift and lipofilling)²⁻⁴; on the other, the medical-aesthetic solution, which presents the most used and standardized options, like botulinum or hyaluronic acid injections, peeling treatments and the use dermarollers⁵. Both approaches are often integrated with each other in order to obtain comprehensive results to the subcutaneous-muscular structure, as well as to the skin proper (*Figure 1*).



Figure 1 - Transdermal technique.



Figure 2 - Injectable technique.

1 AMPOULES

Freeze dried Amino Acids (100mg)

- Glycine 50 mg
- L-Proline 37.6 mg
- L-Lysine 5.4 mg
- L-Leucine 7 mg

1 VIALS

- 1 % Sodium hyaluronate 200 kDa - 1 ml

Figure 3 - Description of the injected mix.

Materials and methods

Our study was performed on 10 patients who were treated at our office in 2015. Our aim was to verify the effectiveness of the bio-revitalizing treatment by comparing it with the use of dermapen and bio-revitalizing products. Our female patients had a mean age of 53 years (39-73) and no relevant associated diseases. All patients present a light to moderate facial aging (0-2 Lemperle scale)⁶.

Each patient was treated in one eye contour area with bio-revitalizing micro-particles (amino acids + noncross-linked hyaluronic acid) (*Figure 2*). The injected mix was 1 cc of noncross-linked hyaluronic acid + 100 mg of freeze dried amino acid (50 mg of Glycine, 37.6 mg of L-Proline, 5.4 mg of L-Lysine, 7 mg of L-leucine) (*Figure 3*).

The other eye contour was treated with a 1.5 mm dermapen with controlled mechanical and biorevitalizing damage seeping through small incisions (*Figure 4*).

Patients were visited 1 day and 7 days after treatment, respectively. Lastly, we assessed patient's satisfaction with the results of treatment, as well as mild-moderate complications, if any, and the discomfort of both treatments, which we determined on the VAS scale and compared with the Students' t-test to define the statistical significance of averages.



Figure 4 - Pre and post treatment.

Results

During follow-up, we identified a standard trend, both in terms of satisfaction and the onset of complications; on the other hand, we also took account of non-uniformity of assessment, with regard to the pain of both treatments. In terms of the onset of complications, on the first day, 8 in 10 patients had greater swelling in the area treated with bio-revitalizing concentrate injection, whilst 2 out of 10 women did not present any difference with the area treated with dermapen. 2 out of 10 patients had bruising in the area treated with bio-revitalizing concentrate injection. Notwithstanding initial swelling-related discomfort, 7 days after treatment, patients reported greater satisfaction about

the area treated with bio-revitalizing concentrate injection, with an average VAS score of 8.1, compared with a 6.7 scored by the area treated with dermapen (*Tables 1 and 2*). A comparison between our data with Students' t-test yielded a statistically significant average variance ($p < 0.012$).

Finally, we evaluated patient discomfort.

This datum did not demonstrate uniformity in the sample. Patients evaluated discomfort at the time of treatment with bio-revitalizing concentrate injection with a mean of 5.4, while the average VAS score was 5.5. in the area treated with dermapen.

The difference between the two data is not statistically significant ($p < 0.87$).

Patient	Bio-revitalizing concentrate	Dermapen + Bio-revitalizing concentrate
1	7	6
2	9	8
3	8	7
4	6	6
5	9	8
6	10	8
7	8	5
8	7	6
9	9	6
10	8	7
Average	8.1	6.7

Table 1 - Aesthetic satisfaction in patients after one week from treatment in areas treated with Dermapen + Bio-revitalizing concentrate, and in those treated with only Bio-revitalizing concentrate injection.

Patient	Bio-revitalizing concentrate	Dermapen + Bio-revitalizing concentrate
1	7	6
2	6	7
3	5	5
4	6	4
5	8	5
6	4	6
7	4	4
8	5	7
9	3	5
10	6	6
Average	5.4	5.5

Table 2 - Discomfort perceived during treatment with Dermapen + Bio-revitalizing concentrate, or with only Bio-revitalizing concentrate injection.

Discussion

Proper treatment of the periorbital area continues to be challenging for plastic surgeons. For a better approach to treatment, it is necessary to fully understand the structures involved in this area's aging process and leverage or counteract their features in order to improve aesthetic results.

Starting from the deepest structure, it is important to identify the bone surface that can function as support and be used for anchors, suspensions or the implantation of prostheses⁷⁻⁸.

Next, we reach the orbicular muscle, whose sphincter movement leads, over the years, to the formation of so-called "crow's feet"; the action of this muscle can be countered in a simple and effective way with the use of botulinum toxin. However, although the intent is to counteract the muscle movement and to prevent the formation of additional wrinkles, existing wrinkles must also be treated. The eyelid skin adheres loosely to the orbicular muscle and becomes more evident with age, when subcutaneous tissue and collagen component (which are already very scarce in this area) tend to disappear. What is enhanced, therefore, is thin skin, which is often loose, non-elastic and with dark spots caused by sun damage.

This is, in our experience, the most difficult area to treat. The use of long-chain hyaluronic acid is to be discouraged, since it is often perceptible to the touch in areas where the skin is so thin, and because it will likely migrate due to the action of the underlying muscle⁹⁻¹⁰. The combined use of botulinum toxin, bio-revitalizing concentrate injection and chemical peeling acts at different levels, starting from the muscle up to the horny layer, and considerably improves skin elasticity, texture and brightness. The addition of dermaroller with its controlled mechanical action on the dermis creates a further action of a different type.

Our patient sample showed greater satisfaction with the side treated only with bio-revitalizing concentrate. This result means for us that, although non-crosslinked hyaluronic acid and amino acids have a relatively low molecular weight, percutaneous penetration, even if facilitated, of the dermaroller, is not satisfactory. Conversely, direct injection of bio-revitalizing concentrate, though at first produces greater trauma and greater liquid retention (swelling), eventually minimizes complications and becomes more effecting within one week from treatment.

Amino acids in the bio-revitalizing concentrate, indeed, stimulate collagen synthesis and growth factors. Ultimately, the action is to recreate the normal structure of the dermis, improve tissue nourishment and activate metabolic processes, while also slowing down catabolic reactions. In our experience, therefore, the best non-surgical treatment against aging of the periorbital area is bio-revitalizing concentrate infiltration following botulinum toxin treatment, to be completed with appropriate peeling.

Conclusions

Treatment of the periocular area with a combined approach including surgery and aesthetic medicine is always advisable. In our experience, in fact, this area has strong aesthetic and emotional relevance for patients, and effective remedy to aging leads to great satisfaction. Although it requires excellent knowledge in both fields, the dual approach is essential and useful even in cases of small surgical complications, which can be improved through cosmetic medicine measures.

Disclosure

The authors declare that they have no conflicts of interest and have not received any contributions for this publication.

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