Evaluation of the effectiveness and safety of absorbable threads, made of polylactic acid in combination with caprolactone, in age-related changes of the skin

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Abstract

The goals of this clinical study were to understand the biophysical properties of the skin of women who were implanted minimally invasive absorbable Aptos threads. Several skin parameters were evaluated in 32 patients at different time intervals: elasticity, hydration, intensity of pigmentation, number and size of pores, skin architectonics. Improvement of skin biophysical properties has been proven and the effectiveness and safety of the method have been confirmed.

Key words: age-related changes of the skin, thread lifting, Aptos threads

Modern aesthetic medicine offers many options for solving the problems of ageing. In recent years, interest of practitioners in minimally invasive methods of thread lifting is dramatically increased. The threads can be made of various materials, having various kinds of configurations. Despite positive clinical effects, doctors and patients are still concerned about the safety of this method in a delayed time interval.

With the active application of threads, the incidence of side effects and complications increased. Evidence-based medicine will help us to understand which methods are better to use in clinical practice with minimal risks of delayed side effects.

We conducted a clinical study to understand the biophysical properties of the skin of women who were implanted minimally invasive absorbable Aptos threads, made of polylactic acid in combination with caprolactone [1-3].
Materials and methods

This study included 32 women with age-related changes aged 35-65 years. All patients have been divided in 3 age groups:

1st group: 35-45 years old women, active reproductive period;

2nd group - 45-55 years, late reproductive period;

3rd group - 55-65 years, perimenopause period.

Patients mostly had combined and oily skin with combined and deformation morphological types of ageing. All patients underwent general clinical, laboratory and instrumental examination.

All participants underwent thread lifting for correction age-related changes [4-7] in the middle third of the face, mental and submental areas, using Aptos Excellence Visage, Thread 2G, Needle 2G - absorbable material made of polylactic acid in combination with caprolactone [8-10].

Results were evaluated using diagnostic instrument complex - Multi Skin Test Center MC 900, VisioFace Quik (manufactured by Courage-Khazaka electronic GmbH, Germany) - for evaluation of the skin condition.

The following parameters were evaluated:

- Elasticity;
- Hydration;
- Intensity of pigmentation;
- Number and size of pores;
- Skin architectonics.

All parameters were evaluated at different time intervals: before thread lifting and 1, 3, 6 and 12 months after implantation in three age groups, considering skin characteristics of each age group of patients.
Statistical processing of the results was carried out using classical mathematical methods of variation using the Microsoft Excel 2007 program analysis package on a personal computer.

**Results and discussion**

Analysis of the biophysical properties of the skin after the thread lifting using Aptos methods (threads made of polylactic acid in combination with caprolactone) showed the following results:

In the study of skin elasticity, it was found that in 7 (21.87%) patients of the active reproductive period aged 35-45 years, the elasticity increased by 25 conventional units at a 3rd month and a stable effect persisted throughout the year (Figure 1). In 15 (46.87%) patients of the late reproductive period aged 45-55 years, the elasticity was as high as possible at a 6th month, increased by 16 conventional units and a year later remained at the level of data achieved at a 3rd month (Figure 2). In 10 (31.25%) patients of the perimenopause period aged 55-65 years, the elasticity also increased by 16 conventional units, gradually increased within 6 months and a year after thread lifting procedure it was higher than the initial level by 10 conventional units. (Figure 3).

In all the subjects of all age groups the level of hydration increased by 10, 9 and 6 conventional units respectively. In patients aged 35-45 years, it was 1.7 times greater than in the group of patients of the late reproductive and perimenopause periods. The maximum level of hydration was noted at the 3rd month (Fig. 4).

The study of the intensity of skin pigmentation showed reduction by 3 conventional units in patients, aged 35-45 years, by 7 conventional units in patients, aged 45-55 years - and by 13 conventional units in patients, aged 55-65 years. Besides, all patients reported significant improvement of skin tone (Figure 5).

Visualization and evaluation of skin structure showed reduction of the number and size of pores by an average of 1.8 times in 97% of cases in patients of active and late reproductive periods and 1.5 times in 89% of cases in women of Perimenopause period (Figure 6, 7).
When assessing skin architectonics in all age groups, its improvement was noted at 10, 17 and 23%, respectively. Visual evaluation of skin structure was carried out in the periorbital and mental regions (Figures 8, 9).

Thus, the analysis showed that in all patients with age-related changes of the skin after implementation of absorbable Aptos threads, the biophysical properties of the skin improved according to the age groups:

- The elasticity increased by 25-16 conventional units;
- The level of hydration increased by 10, 9 and 6 conventional units, respectively;
- Intensity of pigmentation decreased by 3-13 conventional units;
- The size and number of pores decreased from 1.8 times to 1.5 times;
- Architectonics of the skin improved by 10, 17 and 23%, respectively.

These data are confirmed by clinical results, which are recorded in photographs of patients before and after thread application of various modifications of absorbable Aptos threads. A positive result of lifting with the use of absorbable threads with multidirectional barbs preloaded in cannula, is presented in Figure 10.

The desired aesthetic effect was obtained after the thread lifting, which combined the use of 2 absorbable threads made of polylactic acid in combination with caprolactone: Excellence Visage (with multidirectional barbs) in the middle third of the face and Thread 2G (thread attached to the double needles), in the mental region (Figure 11, 12).

**Conclusions**

Biophysical properties of the skin showed significant improvement in patients with age-related changes of the skin in all age groups: an increase of elasticity and hydration, reduction of intensity of pigmentation, reduction of size and quantity of pores, and an improvement of skin architectonics have been proven.

The results of the clinical study confirmed that the Aptos thread lifting method, using threads composed of polylactic acid in combination with caprolactone, is safe and highly effective. It
provides improvement of skin quality and structure that lasts from 1 to 3 years, depending on the degree of age-related changes.

References:


5. Aptos Methods: steps of skin rejuvenation. Internet resource: http://aptos.ru/


Fig. 1. Dynamics of skin elasticity in patients of the 1st group

<table>
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<tr>
<th>Time</th>
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<tr>
<td>After 1 mo.</td>
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<tr>
<td>After 3 mo.</td>
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Fig. 2. Dynamics of skin elasticity in patients of the 2nd group

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Fig. 3. Dynamics of skin elasticity in patients of the 3rd group

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Fig. 12. Patient 3. Before (A) and 2 months (B) after lifting, using Excellence Visage for the middle third of the face and Thread 2G for the mental area