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# Laser and Collost against post-acne

Combination therapy for post-acne scarring: collagen complex and hardware cosmetology.

## Introduction

In modern cosmetology, methods of stimulating cicatricial deformations of the skin are widely used: neodymium laser, vascular dye laser, phototherapy, needle RF, laser resurfacing (non-ablative and ablative).

The trigger for changes in the biological structure of the epidermis and dermis are destructive processes. Positive stimulation, on the contrary, involves deep restorative therapy of the skin. For this purpose, collagen-based, hyaluronic acid-based preparations and plasma therapy are used.

## Materials and methods

The basis of collagen therapy of the skin is the use of injectable sterile products based on heterologous collagen with a preserved triple-helix structure. When these products are injected into the dermis, the activity of matrix metalloproteinases is enhanced, and during the breakdown of the injected collagen, the amino acids necessary for the synthesis of new protein accumulate in the extracellular matrix. With an increase in the concentration of amino acids and peptides, the synthesis of collagen by fibroblasts is activated by a feedback mechanism.

Also, due to the mechanical impact on fibroblasts, their proliferative and synthetic activities are enhanced.

One of such injectable collagen-containing medical products, officially registered in Russia, is the biomaterial "Collost". This is a native, unreconstructed collagen, which is produced using a unique technology that allows obtaining a highly purified collagen matrix with a preserved structure of fibrillar fibers, intended for the repair of damaged or altered connective tissues.

The thread-like structure of native collagen macromolecules serves as the basis for directed migration and differentiation of cells; it allows fibroblasts to migrate in a directed manner and over a greater distance than usual. Being gradually absorbed, the collagen implant is replaced by autologous tissue, which in its histological structure is similar to the surrounding tissues, which is its exclusive advantage over currently manufactured products based on isolated or fractional (split) collagen.

One of the indications for the use of injectable collagen is cicatricial deformations of the skin, in particular post-acne. "Collost" 7 % treats single and shallow scars, "Collost" 15 % - multiple and deep scars. Possible options for hardware cosmetology in combination with injections of Collost gel:

- vascular dye laser,
- phototherapy,
- neodymium laser,
- Needle RF,
- fractional non-ablative erbium laser,
- fractional ablative laser - CO<sub>2</sub> or erbium.

## Biomaterial "Collost"

has been widely used in dermatology and aesthetic medicine for over fifteen years.

## Vascular Dye Laser (VBeam, Candela)

A pulsed dye laser (PDL) is a laser that emits a wavelength of 585 or 595 nm in the yellow band of visible light. It uses as a target (chromophore) hemoglobin, present in red blood cells circulating in blood vessels, and acts primarily through photothermal effects. The dynamic cooling device (DCD) allows to cool the epidermis without significant cooling of the vessel and to actively work in the presence of rashes and post-acne.

**Protocol:** The first procedure — VBeam is preferable, as a result the “color” of post-acne is significantly reduced and inflammation is reduced. After two weeks - “Collost” and then every two weeks alternate procedures No. 3 and then 3-5 “Collost” procedures.

## Combination of techniques: highly selective laser therapy and dermatotrophic therapy

BBL (from Broad Band Light) is a device used for photo procedures. This platform also has the SkinTye II program: infrared heating of the dermis collagen, which starts the processes of its renewal.

**Protocol:** The first procedure is preferable to BBL. The result is a significant reduction in the “color” of post-acne, a decrease in inflammation and improved regeneration. After two weeks - “Collost” and then every two weeks alternate procedures No. 3-4, then 3-4 “Collost” procedures.

## Neodymium laser 1064 nm Nd: YAG (Photona)

Treats acne and post-acne at all stages of the disease, has a bactericidal effect, activates the synthesis of collagen and elastin.

**Protocol:** first procedure – 1064 nm Nd is preferred: YAG-laser. The result is a significant reduction in the “color” of post-acne, a decrease in inflammation and improved regeneration. After two weeks - “Collost” and then every two weeks alternate procedures No. 3-5, “Collost” - 3-4 procedures.

## Needle RF

Thanks to penetration of microneedles into the deep layers of the dermis, it is possible to affect collagen fibers. In addition to the effect of the generated radiofrequency pulses, which heat the skin to 40-42 °C, the device produces microtraumas. This triggers the process of creating new elastin and collagen chains.

**Protocol:** RF, after two weeks — “Collost” and then every two weeks alternate procedures No. 3, “Collost” - 3-4 procedures.

## Fractional Non-Ablative Laser (Fraxel re: storeTM Laser: 1550 nm and 1927 nm)

Thermal damage from non-ablative laser promotes the formation of new collagen and the restoration of the collagen and elastin architecture of the dermis, which provides skin tightening and restructuring of scar deformities.



Fig. 1. A — before the procedures, b — after two procedures with “Collost” 7 %.

The combined use of methods is especially relevant in older patients, since their skin regenerative processes are reduced and the vascular wall suffers significantly after laser use.

**Protocol:** The first procedure is biorevitalization with hyaluronic acid preparations. After 1-2 weeks - fractional non-ablative laser. After another 1-2 weeks (depending on the parameters of the laser procedure and the use of application anesthesia) - the first Collost procedure, after two weeks - fractional laser, after another two weeks - the second Collost procedure, and so on.

**Number of sessions:** 3-6 procedures, depending on the severity of atrophy.

## Fractional ablative laser

*The working body of an ablation laser* is a solid body: erbium-doped yttrium aluminum garnet crystals (Er:YAG), chromium-erbium doped yttrium scandium gallium garnet crystals (Er:Cr:YSGG laser) or a gas mixture (CO<sub>2</sub> laser). Ablative lasers heat the water in the tissues to 300 °C, resulting in instant evaporation of cells (vaporization) at the point of beam penetration.

**Protocol:** The first procedure is biorevitalization with hyaluronic acid preparations. After 1-2 weeks - fractional ablative laser. After 1-4 weeks - the first Collost procedure, after 2-4 weeks - fractional ablative laser, after 1-4 weeks - the second Collost procedure, and so on.

**Number of sessions:** 2-4 laser procedures and 5-7 Collost gel procedures (Collost 15% is preferable when working with cicatricial deformations).

## Conclusion

Practical experience of the combined use of instrumental cosmetology and Collost gel has shown a number of advantages: rapid rehabilitation in patients with reduced regenerative potential, potentiation of the effect when working with scars. The treatment plan for each patient is individual; it depends on the characteristics of the pathological process, intermediate results, protocols of instrumental techniques used, and the capacity of scar tissue when introducing collagen material.

An individual approach, focus on the physiological stages of tissue restoration and a combination of treatment methods provide optimal results. To achieve this, time is also required, which correlates with the physiological stages of tissue restoration, the time of collagen synthesis and reorganization of scar tissue.