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## Rationale for the use of Nd:Yag laser for the prevention of cicatricial complications of postoperative surgical wounds

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After the review of articles describing the studies of scar formation, it is possible to conclude that angiogenesis is one of the main processes in the second and third phases of the wound healing process. On the basis of the reviewed articles appeared a hypothesis about the possibility of correction of angiogenesis by selective coagulation of the maturing scar vessels, without disturbing the processes of proliferation and epithelialization. Nd:YAG lasers are used to work with vascular formations in medicine. Nd:YAG lasers have a small absorption in melanin and expressed in hemoglobin. This type of laser is mainly used as a treatment of vascular pathologies of the skin, laser treatment of different inflammatory dermatoses and in the phlebology. Nd:YAG lasers allow us to transfer a significant energy flow to the vessel without causing damage to the surrounding tissues, there is no risk of skin burns with effective vascular coagulation.

**The purpose of the study:** To find optimal protocols of the Nd-Yag laser usage.

As an experimental proof of our hypothesis, we conducted several treatment procedures. We treated a group of 10 patients, who previously underwent surgical intervention with usual wound suturing. The patients were divided into 2 groups: 1<sup>st</sup> group: patients who underwent laser treatment after operations; 2<sup>nd</sup> group: patients who were followed up after operations by the traditional method of wound healing.

**Results:** In the 1<sup>st</sup> group, we observe a faster resolution of postoperative edema in the suture area, as well as a lesser severity of hyperemia. Within a month, sessions of laser treatment of the suture area were performed, which made it possible to reduce the area of scars, and their color practically did not differ from the color of the surrounding skin. Ultrasound

examination in the area of scars in both groups revealed that its structure and dimensions in the 1st group is closer to intact skin, compared to the results in the control group.

**Conclusions:** The data obtained during this trial can show the direct correlation between angiogenesis and the process of scar formation, as well as the possibility of controlling this process by local impact on the wound with a Nd:Yag laser. The advantage of the proposed method is its availability, ease of use, lack of systemic effects and side effects, as well as high efficiency and relatively low cost.

### Recent Publications

1. Evsyukova ZA, Glushko AV. Protocol of conservative treatment of persistent edema after rhinoplasty, Journal of Nursing & Healthcare. 2022; 7(2): 01-04.
2. Z Evsyukova, E Prazdnikov, F Farhat. The feasibility of studying neodymium laser effects on wound healing in mice. Design of a preclinical experiment. Journal of Nursing & Healthcare. 2022; 7(2): 01-06.
3. Daniel R K, Palhazi P. Ligaments and nasal tip in rhinoplasty: An anatomical study. Aesth Surh J, 2018;38(4):357-68..

### Speaker Biography

Zoya Evsyukova is a plastic surgeon, dermatologist, medical director of the Scientific and Practical Center for Aesthetic Medicine. Zoya graduated from the First Moscow State Medical University named I.M. Sechenov in 2012, since then she has been actively involved in dermatology, namely the problems of regeneration, scar formation and scarless methods of wound healing. Currently investigating the effect of a Nd:Yag laser on the healing of postoperative wounds in animals in an experiment and in humans in clinical practice. She has several patents for the invention of methods for the treatment of cellulite, rosacea, author's protocols for the treatment of complications in plastic surgery. Author of articles on surgery, dermatology, regenerative medicine.

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