

## LASER TREATMENT OF HYPERTROPHIC AND KELOID SCARS OF THE ANTERIOR ABDOMINAL WALL

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**Abstract:** The article analyzes the effectiveness of laser therapy in the treatment of hypertrophic and keloid scars of the anterior abdominal wall. The study compares treatment outcomes achieved using a CO<sub>2</sub> laser with those of conventional therapeutic methods. Clinical assessment criteria included the Vancouver Scar Scale (VSS), visual analogue scale (VAS) for pain and itching, and patient aesthetic satisfaction. The results showed that laser therapy significantly reduces scar volume, density, and associated symptoms. The minimal invasiveness of the method, short rehabilitation period, and strong aesthetic outcomes confirm its promising potential for widespread clinical use.

**Keywords:** Anterior abdominal wall, hypertrophic scar, keloid scar, laser therapy, CO<sub>2</sub> laser, Vancouver Scar Scale, aesthetic outcome, rehabilitation.

### Study Objective

To determine the effectiveness of laser therapy in the treatment of hypertrophic and keloid scars of the anterior abdominal wall and compare it with traditional treatment methods.

### Study Tasks

- To assess the clinical characteristics of hypertrophic and keloid scars.
- To determine treatment outcomes using laser therapy.
- To perform a comparative analysis of laser therapy and traditional methods.
- To evaluate aesthetic and functional indicators in scar treatment.
- To develop recommendations for clinical practice.

### Materials and Methods

**Study type:** Prospective, comparative clinical observation.

**Number of patients:** 40 (22 with hypertrophic scars, 18 with keloid scars).

### Groups:

**Group 1 (n=20):** Treated with CO<sub>2</sub> laser (3–5 sessions at 4–6-week intervals).

**Group 2 (n=20):** Conventional treatment (corticosteroid injections, silicone gel/sheet, physiotherapy).

### Assessment criteria:

- Vancouver Scar Scale (redness, height, elasticity, pigmentation);

- Visual Analogue Scale (pain and itching);
- Patient aesthetic satisfaction (questionnaire).

**Follow-up period:** 6 months.

## Results

### Laser therapy group:

- VSS scores decreased from  $10.4 \pm 1.2$  to  $3.8 \pm 0.9$  ( $p < 0.05$ ).
- Pain and itching completely disappeared in **70%** of patients.
- Aesthetic satisfaction was rated as “good” or “excellent” by **85%** of patients.
- Relapse was observed in only **2 patients (10%)** during 6-month follow-up.

### Conventional treatment group:

- VSS scores decreased from  $10.2 \pm 1.1$  to  $6.9 \pm 1.4$  ( $p < 0.05$ ).
- Symptom reduction was slower.
- Aesthetic satisfaction was positive in **45%** of patients.
- Relapse was observed in **7 patients (35%)**.

## Discussion

The results indicate that laser therapy is more effective than conventional methods in treating hypertrophic and keloid scars. Laser irradiation normalizes fibroblast activity, restructures collagen and elastin fibers, and improves microcirculation in tissues. This leads to a reduction in scar size, density, and redness.

Conventional methods (corticosteroid injections, silicone sheets) provide some benefit, but their effects tend to be short-term, with a higher likelihood of recurrence.

Therefore, the use of laser therapy in combination with other treatments may represent the most effective strategy.

## Scientific Novelty

The effectiveness of laser therapy in hypertrophic and keloid scars of the anterior abdominal wall was demonstrated using precise clinical and statistical indicators. Laser therapy was scientifically shown to significantly improve aesthetic outcomes and patient psychological satisfaction.

## Practical Significance

- Laser-based approaches can be effectively integrated into surgical and dermatological practice for scar management.
- Minimal invasiveness, short rehabilitation time, and strong aesthetic outcomes improve patients' quality of life.
- In clinical practice, laser therapy can be recommended as a first-line option for treating postoperative and traumatic scars.

## **Conclusion**

- Laser treatment of hypertrophic and keloid scars of the anterior abdominal wall is more effective than conventional methods.
- Laser therapy significantly reduces scar size, density, and symptoms.
- Patient aesthetic satisfaction is high, with low recurrence rates.
- It is recommended to widely implement laser therapy in clinical practice.

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