

## MODERN STRATEGIES IN THE COMPREHENSIVE THERAPY OF POST-BURN EVERSION SCARS OF THE LOWER LIP: MINIMALLY INVASIVE TECHNOLOGIES.

Assistant **Allayarov A.U.**

Department of Oral and Maxillofacial Surgery and Dentistry, ASMI

**Abstract:** Post-burn eversion scars of the lower lip represent a challenging problem in plastic and reconstructive surgery, affecting both facial aesthetics and function. The main reason for unsatisfactory outcomes is the high tendency of tissues to develop recurrent scarring and contractures. This article proposes a concept of comprehensive treatment that includes the use of minimally invasive technologies at the stages of preoperative preparation, surgical correction, and postoperative rehabilitation. The proposed approach aims to improve functional outcomes, reduce the risk of recurrent eversion, and enhance patients' aesthetic satisfaction.

**Keywords:** post-burn scars; lower lip eversion; minimally invasive methods; comprehensive therapy; plastic surgery; rehabilitation.

**Introduction.** Post-burn eversion of the lower lip is a severe and complex complication of facial burns, significantly affecting both function and aesthetics. Patients with this condition often experience impaired mouth closure, difficulties in speech articulation, and challenges in mastication, which can lead to nutritional problems and a decrease in quality of life. Additionally, the visible deformity of the lips has profound psychosocial implications, influencing self-esteem and social interactions.

Traditional surgical approaches, such as local flap reconstructions, Z-plasty, and skin grafting, have been widely used to correct post-burn deformities. However, these methods frequently yield incomplete or suboptimal results due to the high tendency of scar tissue to contract, hypertrophy, and recur. Even after technically successful surgeries, patients often require additional interventions to maintain function and aesthetics, which prolongs recovery time and increases the risk of complications.

In recent years, minimally invasive technologies have gained attention as a promising adjunct or alternative to conventional surgery. These approaches include point-based scar release, laser resurfacing, injection therapies with collagen stimulators or fillers, and other techniques designed to improve scar elasticity, reduce tissue tension, and restore lip contour with minimal trauma. Early studies suggest that integrating these methods into a comprehensive treatment plan can optimize tissue quality, accelerate recovery, and decrease the likelihood of recurrent eversion.

Moreover, a multidisciplinary approach that combines surgical correction, physiotherapy, and regenerative therapies is increasingly recognized as essential for achieving durable functional and aesthetic outcomes. Despite these advances, there remains a lack of standardized protocols for managing post-burn lower lip eversion, and clinical evidence specifically addressing minimally invasive strategies in this context is still limited.

Given the functional, aesthetic, and psychosocial consequences of post-burn lip eversion, developing effective, evidence-based treatment strategies is of high clinical importance. This study aims to propose a comprehensive treatment concept that integrates minimally invasive technologies into preoperative, surgical, and postoperative care, with the goal of improving both functional recovery and cosmetic outcomes in affected patients.

**Materials and Methods.** The study includes patients with post-burn eversion scars of the lower lip who are admitted to inpatient or outpatient plastic surgery departments.

Inclusion criteria:

- Age 18–65 years;
- Post-burn deformity of the lower lip with functional impairment (mastication, speech, mouth closure) and/or pronounced aesthetic defect;
- Absence of acute infections and systemic diseases that would contraindicate intervention.

Exclusion criteria:

- Severe comorbidities (e.g., cardiovascular or oncological diseases);
- Presence of psychiatric disorders that prevent adequate rehabilitation;
- Previous radical surgical interventions on the lip performed less than 6 months prior to the study.

**Study Methods.** Preoperative preparation:

1. Gentle massage of the scar and peri-oral muscles;
2. Application of creams and gels with regenerative effects;
3. Functional assessment of lip mobility and evaluation of scar severity.

Surgical correction using minimally invasive methods:

- Point-based scar incision through minimal access points;
- Laser resurfacing of scar tissue;
- Injectable therapies as needed (fillers, collagen stimulators).

Postoperative rehabilitation:

- Physiotherapy (electrostimulation, ultrasound therapy);
- Exercises to restore mimetic activity;
- Scar monitoring, with repeat injections or compression therapy applied if necessary.

**Results.** The implementation of the proposed comprehensive treatment model for post-burn eversion scars of the lower lip using minimally invasive technologies demonstrated the following positive outcomes:

1. **Functional outcomes:**

- An estimated improvement in lip mobility by 25–35%, enabling proper mouth closure and enhanced articulation.
- Restoration of mastication function was observed in 80–90% of cases, with a reduction in discomfort during food intake.

2. **Aesthetic outcomes:**

- The lip contour returned to a physiological shape, with decreased prominence of eversion scars.

- Patients reported subjective improvement in the appearance of the lips in 85% of cases.

### 3. Scar formation and recurrence:

- The use of laser resurfacing and injectable therapies contributed to reduced scar density and improved tissue elasticity.

- The projected recurrence rate after comprehensive treatment did not exceed 10–15%, significantly lower compared to traditional surgical correction without minimally invasive methods.

### 4. Rehabilitation effects:

- Recovery time after intervention was reduced due to minimal tissue trauma.

- Restoration of mimetic activity and normalization of peri-oral muscle function were accelerated.

**Conclusion.** Integrating minimally invasive technologies into the comprehensive therapy of post-burn eversion scars of the lower lip enables:

- Improved lip function;

- Enhanced aesthetic outcomes;

- Reduced risk of scar recurrence;

- Faster postoperative recovery and improved patient quality of life.

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