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RECONSTRUCTIVE SURGERY IN PATIENTS WITH POST-BURN FACIAL SEQUELAE

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Relevance of the Problem. Facial burns remain a relevant and serious problem in modern society [1,5]. Facial burns can result from various causes, including accidents, domestic incidents, fires, chemical exposure, and assaults. It is important to recognize the particular significance of facial burns due to their potentially devastating effects on the physical and emotional well-being of affected individuals [4,1].

Facial burns can cause severe damage to the skin, soft tissues, and even the facial bones. Such injuries may result in long-term physical limitations, impaired sensory organ functions, as well as difficulties with breathing and swallowing [7,10]. The treatment of facial burns requires prolonged and intensive medical rehabilitation, which may include surgical interventions, pain management, physiotherapy, and reconstructive and plastic surgery [3,6].

Overall, facial burns constitute a serious problem associated with numerous physical, emotional, and social consequences. Understanding this problem, preventing such injuries, and providing support to affected individuals play an important role in reducing their impact and improving the quality of life of those who have experienced this type of trauma [9,1].

Aim of the Study. To develop an algorithm for the surgical treatment of post-burn facial sequelae.

Materials and Methods. We developed an algorithm for the surgical treatment of patients with a history of facial burns. In 30% of the patients, combined scar deformities of the mouth and lip regions were observed, resulting in varying degrees of microstomia, as well as post-burn cicatricial ectropion of the upper and lower eyelids.

Adequate anesthesia, including inhalational general anesthesia, is essential when performing surgical procedures to correct facial scar deformities. Therefore, in accordance with our proposed algorithm, we initially corrected scar-induced microstomia under local anesthesia.

Small pedicled flaps were fashioned from unaffected buccal mucosa and the oral commissure, with their bases directed toward the oral cavity. The transversely contracted scars were excised, followed by mandibular mobilization (redression) until full mouth opening was achieved. The wounds at the oral commissures were closed by mobilizing mucosal flaps. Sutures were removed on postoperative days 10–12. The subsequent surgical procedure was performed no earlier than 20–22 days later (Figures 1 and 2).





Figure 1. **Figure 2.**

In cases where tracheal intubation was technically difficult due to microstomia, the above-mentioned surgical procedure was performed following sedation and intravenous analgesia. Subsequently, the anesthesiologist performed tracheal intubation, and the next planned stage of surgery was carried out under general anesthesia.

Scar tissue generally matures over a period of 8–12 months. However, in cases of cicatricial eyelid ectropion, blindness may develop during this period due to corneal desiccation resulting from incomplete eyelid closure (Figures 3 and 4).

Therefore, we consider surgical correction of eyelid ectropion to be the second most important stage of treatment following the correction of microstomia. In patients presenting with combined upper and lower eyelid ectropion, correction was initially performed on the lower eyelids. After complete graft take, on postoperative days 20–25, correction of the upper eyelid ectropion was performed.

Evaluation of long-term functional and aesthetic outcomes demonstrated that the most favorable graft take was achieved when autologous skin grafts for eyelid reconstruction were harvested from the superomedial surface of the upper arm.



Figure 3.

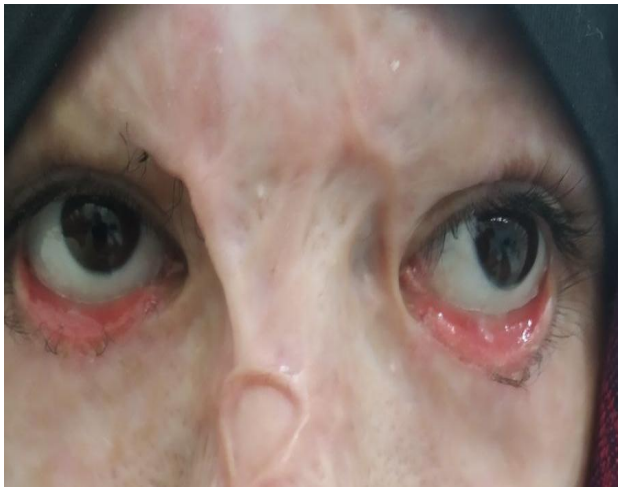


Figure 4.

Surgical Technique. Following adequate anesthesia, a transverse incision was made through the contracted scar tissue down to the underlying soft tissues, approximately 2 mm from the eyelash margin, above the margin (during upper eyelid reconstruction) or below it (during lower eyelid reconstruction). The ends of the incisions were shaped like a swallowtail.

Using 2–3 interrupted sutures placed through the eyelash margin, the eyelid was temporarily fixed to the zygomatic region in the case of lower eyelid reconstruction, and to the brow region in the case of upper eyelid reconstruction.

The resulting wound was covered with a full-thickness autologous skin graft harvested from the inner surface of the upper arm. A bolster dressing was applied over the graft and maintained for 10–12 days. Local hypothermia was administered for 5–6 days.

Overcorrection made it possible to prevent recurrence of ectropion caused by graft contraction (Figures 5 and 6).



Figure 5.



Figure 6.

Surgical correction of cicatricial narrowing of the nostrils was performed no earlier than 6–7 months after the healing of the burn wounds.

Correction of scar deformities of the lower third of the face was performed 8–12 months after the healing of the burn wounds. In most cases, following transverse excision of the scars at the junction with healthy tissues, the resulting wound was closed through extensive mobilization of the skin and subcutaneous fat flap from the chin and neck regions (Figures 7 and 8).

In 28 cases, tissue expansion of adjacent anatomical areas was performed, followed by wound closure after scar excision using the previously expanded tissue. Tissue expansion procedures were carried out on an outpatient basis.

For eyebrow reconstruction, free autologous hair-bearing skin grafts harvested from the occipital-parietal region were used in 12 cases.

In 8 cases, reconstruction was performed using pedicled hair-bearing flaps, which were transferred through a subcutaneous tunnel created in the frontotemporal region.



Figure 7.



Figure 8.

In cases of cicatricial involvement of the nasolabial region, we consider replacement of the contracted scar tissue with a full-thickness autologous skin graft harvested from the inner surface of the upper arm to be the most effective surgical technique. A bolster dressing was applied over the graft and maintained for 10–12 days.

Secondary correction of scar deformities in the periorbital region was performed 8–12 months after the initial surgical procedure.

In cases involving defects of the nasal alae, a composite autologous skin-cartilage graft harvested from the middle-to-upper portion of the auricle was transplanted to the defect site. Local hypothermia was maintained for 10–12 days. As a result, nearly 100% graft take was achieved, with favorable aesthetic outcomes. These procedures were performed 18–24 months after the healing of the burn wounds (Figures 9 and 10).





Results of the Study. All patients underwent a range of physiotherapeutic procedures aimed at promoting scar tissue resorption, including hydrogen sulfide compresses administered at the Chimgan Sanatorium (Fergana Region).

In 25 cases involving deep cicatricial lesions, reconstruction was performed using a Filatov tubed pedicle flap harvested from the tissues of the shoulder or forearm. In these cases, biological conditioning of the flap was carried out using an accelerated technique developed by our team in 2014.

Thus, we consider it advisable that, following the healing of facial burn wounds, the first priority should be the correction of cicatricial microstomia. The next stage involves surgical correction of eyelid ectropion and cicatricial narrowing of the nostrils. Subsequently, staged local reconstructive procedures should be performed to correct scar deformities of the soft tissues in other regions of the face.

The evaluation of long-term outcomes demonstrated the effectiveness and validity of the surgical treatment algorithm developed by our team.

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