CHEILOPLASTY IN POST-BURN DEFORMED LIPS

Saadeldeen W.M.

Department of Plastic Surgery, Assiut University Hospital, Assiut Medical School, Egypt

SUMMARY. The lip is a part of the face that is frequently affected by burn injury. Post-burn scar sequelae in this area often result in cosmetic disfigurement and psychological upsets in patients, especially young adult females. A burn destroys the aesthetic features and lines of the lip. Plastic and reconstructive surgery of the face has a long history. Many local and regional flaps have been used for reconstruction of surgical or traumatic defects. Procedures to enhance the cosmetic features of the lips have been performed for centuries. Only within the past 25 years, however, has augmentation cheiloplasty become commonplace. Within that time, a number of different techniques have been developed. The goal of reconstruction is to achieve aesthetic results using plastic materials having the same properties as the affected area. This paper describes some clinical situations and possible reconstructive solutions.

Patients and methods

This study was carried out in the Department of Plastic Surgery, Assiut University Hospital, Egypt, between 20 May 2005 and 5 January 2007 on 46 patients (age range, 17-37 yr; 34 females and 12 males) out of a larger group of 86 patients. Thirty-six of the 46 patients (41.9%) had isolated facial burn scars (27 females and 9 males, respectively 31.4% and 10.5%), while ten (11.6%) had facial burn scars as part of total body burn (7 females and 3 males, respectively 8.1% and 3.5%). Forty patients (28 females and 12 males) presented with functional problems due to a major facial burn as their main complaint, in addition to aesthetic disfigurements of the lips. The functional problems included inter-
ference with eating, partial nostril obstruction, speech problems, and bad oral hygiene. Reconstructive surgery was performed to overcome the functional problems - this group was excluded from the total number presenting with deformities after facial burns. Our target group consisted only of the patients who complained of aesthetic disfigurement of their lips (Table I).

A scar control protocol was designed for patients with recent immature scars. This included pressure garments, topical corticosteroid creams, topical anti-scar gels, topical silicone sheets, and corticosteroid injections. The program was conducted for 6-12 months until complete control of active scars and subsidence in the activity of hypertrophic or keloid scars.

All patients underwent pre-operative assessment of their general condition for pre-operative fitness - 12 patients had their operation postponed owing to anaemia and hypoalbuminema.

A series of photographs were taken of each deformed lip at the time of presentation, pre-operatively, and immediately and late post-operatively.

All patients subjected to surgery signed a consent form stating the importance of their compliance with the long and detailed aftercare programme and the need of immediate post-operative scar control.

The surgical plan was designed in 14 females (30.4%) for the resurfacing of geographic facial areas, release of contractures, and aesthetic lip line reconstruction; 20 females (43.5%) were designed only for cheiloplasty; 8 male patients (17.4%) were designed for the release of contractures and cheiloplasty, and 4 male patients (8.7%) were designed only for cheiloplasty.

Our surgical technique for upper lip cheiloplasty in females was performed as follows: excision of the scarred Cupid’s bow (Figs. 1, 2), upper lip vermilion lifting to augment the vermilion and redraw the lazy M shape of Cupid’s bow (Figs. 2, 3). Lower lip cheiloplasty was designed for bordering, using a full-thickness graft for the chin area (Fig. 4).

Each patient’s chart was reviewed for the following data: age, sex, burn type, burn percentage area, estimated time for complete healing, wound complications during dressing, facial scar types (recent, mature, controlled or not, hypertrophic or keloids, primary or secondary after previous surgery).

Lip scars were categorized in all patients as isolated lip scars, lip scars as part of facial burn scars, or lip scars as part of total body burn scars. Burned lip deformities were analysed and classified as upper lip Cupid’s bow scarring and deformities, upper lip vermilion scarring, upper lip alopecic scars in males, lower lip lining deformities, or lower lip contractures.

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Post-burn cheiloplasty in males was performed by excision of both the scarred Cupid’s bow and the alopecic skin; complete or partial moustache reconstruction was performed using an island superficial temporal artery scalp flap.

<table>
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<th>Number of patients</th>
<th>Type of deformity</th>
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<tr>
<td>46</td>
<td>Aesthetic disfigurement only</td>
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<tr>
<td>40</td>
<td>+ Functional problems (excluded from the study)</td>
<td>46.5%</td>
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<table>
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<tr>
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</tr>
<tr>
<td>14</td>
<td>-</td>
<td>Late</td>
<td>No</td>
</tr>
</tbody>
</table>

Table I - Study group

Table II - The study group of patients

Fig. 1 - Upper lip - deformed Cupid’s bow.

Fig. 2 - Marking of area to be excised.

Fig. 3 - Upper lip - lifting of vermilion.

Fig. 4 - Final result.
The aftercare programme included physiotherapy, prevention of scarring, prevention of hyperpigmentation, and advice on camouflaging and permanent make-up.

Case reports

Case 1
A 27-yr-old female presented 12 months after healing from a flame burn affecting the lips as part of a face burn. The scarred lip aesthetic disfigurement was analysed. Cheiloplasty was performed by upper lip bordering and vermilion lifting, lower lip bordering by full-thickness skin graft, and correction of eversion. Aftercare consisted of the application of anti-scar gels and corticosteroid creams for 6 months following complete healing, plus local care of the full-thickness graft donor site. The follow-up examination after 18 months demonstrated the end result of our cheiloplasty technique in post-burn deformed lip aesthetics and good patient satisfaction (Figs. 5-10).

Case 2
A 15-yr-old female presented 8 months after healing from a flame burn that included the lips as part of a facial burn. Scar control was performed for 6 successive months. The scarred lip aesthetic disfigurement was analysed. Cheiloplasty was performed by upper lip bordering and lifting, plus lower lip bordering by full-thickness skin graft and correction of the eversion deformity. The aftercare programme consisted of the use of pressure garments and silicone sheets, the topical application of anti-scar gels and corticosteroid creams for 6 months following complete healing, and local care of the full-thickness graft donor site. The follow-up examination at 6 months demonstrated the result of our technique for cheiloplasty in post-burn deformed lip aesthetics and good patient satisfaction (Figs. 11-14).

Case 3
A 35-yr-old female presented 24 months after healing from a flame burn that included the lips as part of a facial burn. She had two surgical operations in one session to correct her lip commissure contracture and to reconstruct her lower lip eversion deformity. The scarred upper lip aesthetic disfigurement was analysed. Cheiloplasty was performed by upper lip bordering and vermilion lifting. The aftercare programme consisted of the topical application of anti-scar gels and corticosteroid creams for 6 months following complete healing. The follow-up examination at 12 months demonstrated the result of our cheiloplasty technique in post-burn deformed lip aesthetics and good patient satisfaction (Figs. 15, 16).
Case 4

An 18-yr-old male presented 19 months after healing from a flame burn in the face. He complained of disfigurement of the upper lip and lip skin scarring. Cheiloplasty was performed by excision of the scarred lip skin, upper lip bordering, and superficial temporal artery island flap for total moustache reconstruction. Aftercare included scar control and care of the donor site following complete healing. At 8 months the follow-up examination demonstrated the end result of male cheiloplasty in post-burn deformed lips and good patient satisfaction (Figs. 17, 18).

Fig. 17 - Pre-operative view. Fig. 18 - Eight-month post-operative view.

Case 5

A 21-yr-old male presented 19 months after healing from a flame burn in the face. His complaint was disfigurement of the upper lip and partial alopecia of the moustache. Cheiloplasty was performed by upper lip bordering and superficial temporal artery island flap for moustache reconstruction. Aftercare including scar control and care of the donor site following complete healing. A 2-year follow-up examination demonstrated the end result of male cheiloplasty in post-burn deformed lips (Figs. 19-22).

Fig. 19 - Pre-operative view. Fig. 20 - Immediate post-operative result.

Fig. 21 - Early post-operative view. Fig. 22 - Late post-operative result.

Results

Forty-six cheiloplasty procedures were performed in 46 patients (34 females and 12 males) with post-burn deformed lips. Their ages ranged between 17 and 37 yr. Four of them presented after other primary surgery performed previously after trials to correct their deformities. Twenty-eight patients presented early, before maturation of their scars, and these were put on our scar control programme; 18 patients presented late after maturation of their scars; and 12 patients were unfit for anaesthesia and treatment was postponed in order to check their general condition.

Fourteen females (30.4%) underwent surgery for the resurfacing of geographic facial areas, the release of contractures, and aesthetic lip line reconstruction; 20 females (43.5%) had surgery only for cheiloplasty; 8 male patients (17.4%) had operations for the release of contractures and cheiloplasty; and 4 male patients (8.7%) were subjected to cheiloplasty alone.

Upper lip cheiloplasty in females was performed by upper lip Cupid’s bow bordering and lip vermilion lifting. Lower lip cheiloplasty in females was performed by vermilion lifting and bordering by full-thickness skin graft.

Upper lip cheiloplasty in males was performed by Cupid’s bow lip bordering and partial or complete moustache reconstruction, using a superficial temporal artery island flap.

Two cases (4.3%) that were complicated by minor spotty partial loss of the full-thickness skin graft required frequent dressing until complete healing by secondary intention, followed by additional scar control for the scarred spots. In one case (2.2%) complicated by superficial necrosis of the superficial temporal artery island flap, dressing was carried out until healing occurred with no additional scars. A secondary procedure for additional refinement for the purpose of debulking the graft was performed in two male patients (4.3%). The total infection rate was 0%. Donor site morbidity for the full-thickness skin graft was minimal and controlled by local care after 12 months.

All patients attended for scheduled post-operative follow-up visits in the aftercare program. This programme was conducted for 6 to 12 months and included detailed scar control, as follows: pressure garments for the grafted chin area, silicone sheets, silicone-containing creams and gels, topical corticosteroid-containing creams, and intralesional injection of corticosteroids. After scar control, residual hyperpigmentation was controlled by topical bleaching agents for 3 months.

After 12 months’ follow-up the end result was assessed by patient satisfaction, which was fairly good in 41 cases (89.1%).
Discussion

Burn scars in the lips and disfigured lip aesthetics are commonly treated with psychological assurance and training for perfect camouflaging, especially with regard to female burn victims. Some cases with major deformities that go beyond simply aesthetic considerations are treated surgically either by release of contractures and by local flaps for reconstruction of lip defects or by commissuroplasty.

Partial- and full-thickness skin grafts are commonly used for resurfacing scarred perioral regions, including lip borders and lines, as also for reconstructing post-burn deformed lower lips and, above all, for releasing contracted and everted lips. Skin graft losses are higher in the case of full-thickness skin grafts around the mouth opening because of contamination by food and fluids.

Camouflaging as a solution for deformed lips, using lip bordering and lip liners as either a permanent or a temporary measure, cannot not hide the scar from the patient. Even if a woman tattoos her lip line to treat a scar, she will continue to search for aesthetic surgery to line her lips as a natural acceptable solution for a delicate human being.

This work is the first to present a detailed surgical plan for the correction of post-burn deformed lip aesthetics that does not add more scars to the perioral area with the application of local dermocutaneous flaps. We used cheiloplasty to restore upper and lower aesthetic lip linings, borders, and volume. A description of deformities and the normal aesthetic anatomy of the lips was not the target of this work. We have not focused on the prevention of deformities or on post-operative care as these topics are discussed in detail in other published clinical studies (see below):

- Vandenbussche F. et al., 1980, described and discussed lip burns; he also attempted to clearly define the polymorphic nature of lip burn sequelae by introducing a simple classification of the affection. He added that a correct understanding of the processes involved in scar formation was essential for the development of a rational plan for surgical repair.19
- Lew D. et al., 1987, reconstructed severely burned lips in two patients cases, using a bi-pediced lip flap to transfer both bulk and vermilion from the relatively normal donor lip to the atrophic burned lip. The result was an increase both in tissue bulk and in the size of the vermilion.20
- Lyons G.B. et al., 1989, performed upper lip reconstruction using the free superficial temporal artery hair-bearing flap in male patients.21
- Achauer B.M., 1992, discussed the priorities, timing, techniques, and philosophies of reconstruction of the burned face. He analysed each disfigured anatomic area and described the appropriate procedure. However, he did not mention any procedure for the correction of lip aesthetics.22
- Felman G., 1993, discussed direct upper-lip lifting in thin and tightly pursed lips as a more effective and successful approach for enhancing the shape of the upper lip.23
- Maloney B.P., 1996, analysed the characteristics of the after-effects of a Cupid’s bow, the relative length of the upper lip, and the projection or bulk of the lips. He presented aesthetic guidelines for each of these characteristics, which - when understood by the surgeon - will help the surgeon to formulate an operative plan.24
- Gatti J.E., 1999, discussed serial fat grafting for permanent lip vermilion augmentation in thin atrophic lips.25
- Constantinidis J. et al., 1999, described the functional and aesthetic objectives of the reconstruction of lip defects. They divided the lips into aesthetic subunits in order to benefit from the design of lip reconstruction procedures and they differentiated between vermilion defects on the one hand and partial- and full-thickness lip defects on the other.26
- Niechajev I., in 2000, using a new instrument that he himself originally designed, the dermis-fat graft passer, speeded up and facilitated execution of the dermis-fat graft as one of the surgical techniques he used for lip augmentation. He also used V-Y plasty, lip lifting by buffalo horn excision, lip lengthening by frenulum plasty, and lip reduction by wavy tangential excision.27
- Foyatier J.L. et al., 2001, presented many examples of burn scar treatment. They reconstructed the anatomical units and applied certain aesthetic techniques (such as rhinoplasty, lifting, tattooing, and autologous fat injections) that made equal contributions to the improvement of the quality of results.28
- Garson S., 2002, discussed the aspect of the effect of prevention, which in the lip aesthetics of perioral burns reduces the incidence of disfigurement due to inadequate or inappropriate treatment of this kind of burn, which is most commonly part of face or body burns. However, he added that in deep burns deformity could be inevitable despite good initial treatment, local care of burned lips, and aftercare of healed scars. He judged that the progress made in burns management in the last 40 years had contributed to the improvement of functional and aesthetic prognosis. He stated that early surgical intervention had been modified as a conservative approach.6
- Hafezi F. et al., 2002, used a bitemporal artery hair-
La lèvre est une partie du visage fréquemment atteinte de lésions dues aux brûlures. Souvent les séquelles cicatricielles ont été utilisés pour la reconstruction des défauts chirurgicaux ou traumatiques. Depuis plusieurs siècles il existe des progrès dans la chirurgie plastique. Les lèvres sont un cas particulier, car leur reconstruction est délicate et demande une grande attention aux détails. Les lèvres sont composées de tissus mous, peau et musculaires, qui doivent être restaurés avec soin pour obtenir un résultat esthétique.

La chirurgie plastique et reconstructrice du visage vante une longue histoire, et divers types de lambeaux locaux et récurrents ont été proposés. Pour améliorer l’aspect cosmétique des lèvres. Néanmoins, la technique de la chéiloplastie pour l’augmentation des lèvres est devenue commune seulement depuis 25 ans. Pendant cette période de nombreuses techniques ont été perfectionnées. La technique nous a été proposée par Egeland B. et al., 2008, qui ont obtenu des résultats esthétiques en utilisant des matériaux plastiques ayant les mêmes propriétés de la région atteinte. Il présente une série de situations cliniques pertinentes.

Conclusion

Our technique has several advantages: it is easy to design; it is a one-stage reconstruction of lip aesthetics; operating time is short with good pre-operative marking; it is a reliable technique because it uses local tissues, without any aggressive undermining and without adding any more scars; there is no need of post-operative occlusive dressings as dryness is the rule here; the technique can be widely used in place of permanent tattooing and lining; there is minimal need of post-operative physiotherapy as normal movement of the lips will be spontaneous; and morbidity can be easily treated.

The technique’s disadvantages are as follows: full-thickness skin grafts have a certain percentage of morbidity in the form of partial loss, which may alter the aesthetic results; the possibility of contamination is inevitable in some patients with bad eating habits that could affect such a delicate surgical procedure; the long-term aftercare programme may be tedious for irritable patients seeking immediate results; and the possible need of secondary refinement procedures in male patients with a bulky superficial temporal artery island flap for moustache reconstruction.
BIBLIOGRAPHY