Management of Forehead Scars

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KEYWORDS

• Wound healing • Scars • Forehead • Facial plastic surgery • Laser • Filler • Reconstruction • Eyebrow

KEY POINTS

- The homogenous topography of the forehead makes the creation of inconspicuous scars challenging.
- Careful preoperative planning, open communication, and setting realistic expectations are vital to any scar revision case.
- Use natural borders (hairline, brow, temporal line, facial rhytids) to disguise scars whenever possible. Hair transplant can help restore appearance when scars involve hair-bearing skin.
- Protection of function always takes priority over restoration of form.
- Convex, contracted scars may benefit from injection of filler, including fat transfer.

INTRODUCTION

Injuries to the forehead pose several challenges to the facial plastic and reconstructive surgeon. Some of these challenges are held in common with other facial regions, and others are unique. This article is designed to take the reader through an organized, stepwise approach to acute and chronic scar management of the forehead region. Forehead wounds may present for a variety of reasons, including facial trauma, defects remaining after excision of malignant or nonmalignant lesions, the result of congenital facial lesions, and from iatrogenic causes.

Reconstruction of forehead wounds can be approached using a standardized and complete methodology. Repair may range from local wound care, primary closure, local tissue rearrangement, regional flap reconstruction and complex free tissue transfer, or any combination thereof. In addition to optimizing the patient's aesthetic appearance, goals of repair include protection of vital structures, prevention of infection, and avoidance of chronic wound complications.

Successful reconstruction depends on several synergistic factors. The nature of the wound, careful preoperative planning, surgical competence, and the global medical status of the patient all play a role. When one of these pillars of wound repair are lacking, the others become even more important. Patients who smoke, have vasculopathy, or are not medically stable to undergo an intensive procedure may have limited options for repair. The importance of this concept cannot be emphasized enough for the neophyte surgeon. Patients may require serial procedures (in the case of tissue expander use, for example), and the possibility of this should be discussed up front. Depending on the nature of their injury, patients may remain significantly disfigured, even after the

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best possible reconstructive effort has been executed well. It is vital for the surgeon to maintain open and honest communication with the patient throughout the reconstructive journey.

A scar is the final, unavoidable result of any wound, whether it is repaired masterfully or neglected in its entirety. Facial scarring can be particularly troublesome to patients because it is something the patient and those they encounter will see on a daily basis. Even if vital structures have been protected and function restored, an unappealing facial scar can cause persistent and significant emotional suffering in patients.[1] Surgeons can minimize the impact of facial scarring on a patient through careful planning and the use of optimal reconstructive measures.

Scars are fluid, evolving over time. They change in color when healing and when exposed to various environmental factors such as sunlight or a chemical irritant. They change in shape when exposed to tension or movement during wound healing. Although the strength of a scar builds over time, it will never regain the full resilience of native tissue. Last, scars are subject to hereditary forces. Some patient's wound healing may be burdened with the challenges of dyschromias, scar hypertrophy, or keloid reactions over time. The successful facial plastic surgeon uses a broad armamentarium to address the unique needs of each patient and optimize final outcomes.

MANAGEMENT AND TREATMENT

Overview

Scar management begins at the time of cutaneous insult. Wounds should be cleaned, and copious irrigation used. Anesthesia (local, intravenous, or general) may be needed for adequate debridement and examination. Never allow treatable patient discomfort to limit one's initial examination.[2] Depending on the wound class, antibiotics may be indicated. In cases of polytrauma, where the facial wound is not a singular injury, cooperation with several other treatment teams may be necessary. When forehead wounds are the result of a surgical excision, these primary steps may have already occurred.

In comparison with other facial regions, the forehead is relatively devoid of geometric complexity. Any aberration of the symmetric, gentle contour, and homogenous appearance of the forehead readily stands out to the observer. A concave scar within the convex topography of the mid-forehead can cast shadows and distort light reflection patterns, making an otherwise innocuous scar readily stand out.

A complete understanding of facial anatomy as well as the biomechanical interactions that occur both acutely and over time within the face is a foundational principle in successful facial reconstruction. One of the first things a surgeon should become facile with is facial analysis. Facial analysis helps to define both aesthetic ideals, as well as aberrations. Facial analysis can be performed from many observer views (frontal, oblique, profile), but forehead analysis is often most helpful using the frontal view. One should be careful not to perseverate with exacting geometric definitions at the expense of patient preference and the pursuit of global facial harmony.

All forehead intervention must take into consideration the effects it will have on adjacent key anatomic structures. Forehead tissues are generally unforgiving, and distortion of adjacent subsites is a frequent challenge. It is also important to anticipate future changes, such as the effect of balding on hairline shape and location. A carefully placed scar line within a young male's hairline may become painfully obvious several years later.

Facial Analysis

The facial frame can be divided into subunits both vertically and horizontally. Facial height can be divided into thirds, with the forehead comprising the superior third. The superior third (forehead) is defined as running from trichion to glabella (**Fig. 1**). Although typically described as the superior third, variability in a patient's hairline may result in the forehead subunit comprising significantly more or less than one-third of the overall vertical facial dimension.

The face can also be subdivided into vertical segments using the facial vertical fifths model. This results in 3 unique vertical subunits: mid-forehead, paramedian, and lateral (temporal; see

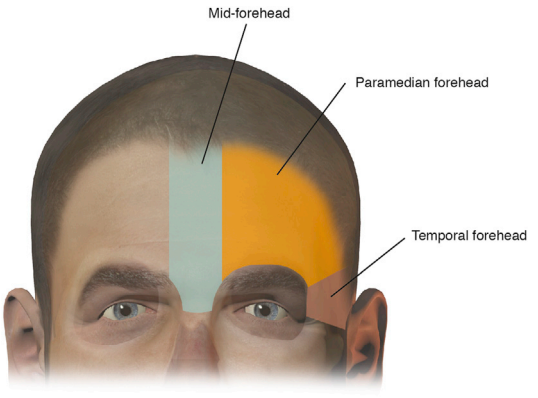

Fig. 1. Forehead subunits (mid-forehead, paramedian, temple).