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# Using Mustardé Flap for Reconstruction of a Traumatic Facial Injury: Case Report

**Francisco de León Gálvez[1*], Luis Fernando Montenegro Carrillo[2]**

[1]Private Plastic Surgery Clinic, Guatemala City, Guatemala
[2]Men's Plastic Surgery Department, Guatemalan Social Security Institute, Guatemala City, Guatemala
Email: *fdeleong21@gmail.com, dr.luismontenegro@hotmail.com

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## Abstract

Flaps become the first option when primary closure is not possible, using them to reduce the tension in the closure, as well as improving the texture and color, which ends in having a better aesthetic outcome. The Mustardé flap is a flap used for the cheek and lower eye lid defects. We present a 26-year-old male with an avulsive wound in the right maxillary region, with no bone injuries, taken to the operative room performing a Mustardé Flap for reconstruction of the defect area. Patient completed a 7-day antibiotic regimen, using non-steroid anti-inflammatories for pain, wound cleaning and flap hydration with mineral oil, subsequently having an adequate clinical and aesthetic evolution. Conclusion: The Mustardé flap can be a useful pedicled flap for the reconstruction of full-thickness defects.

## Keywords

Aesthetic, Color, Defect, Flap, Mustardé, Patient

## 1. Introduction

Flaps become the first option when primary closure is not possible to cover defects, reducing the tension and improving the appearance because of their texture and color [1]. Reconstruction depends on the size of the defect and the different techniques aim to achieve good aesthetic quality and acceptable sequel at the donor site [2]. Advancement flap design is relatively simple and can be successfully applied to repair a wide variety of small- or moderate-sized cheek defects. This group of flaps is based on an incision that allows "sliding" movement of the tissue [3]. Reconstruction depends on the size of the defect and the different techniques aim to achieve good aesthetic quality and acceptable sequel at the donor site [4].

The cheek rotational flap, or Mustardé flap, was described by Mustardé in 1971 and then by Callahan & Callahan (1980) [5]. For reconstruction, as written by

Mustardé, "When the eye is still present, reconstruction of an eyelid or even a part of it requires a minimum of three elements: an outer layer of skin, an inner layer of mucosa, and a semirigid skeleton interposed between them" [6]. Considering the cheek aesthetic unit, the following flaps are used in the cheek reconstruction: advancement, rotational and cheek advancement flaps (Mustardé) rotation flaps, cervico-facial and rhomboidal (Limberg), transposition or primary closure. The Mustardé flap is an appropriate choice for the repair of primary defects that compromise both (nasal and cheek) aesthetic units [7].

An incision is made from the lateral aspect of the defect to the lateral canthus and extends superolaterally, then inferiorly ending at the preauricular area. The flap is elevated in the subcutaneous plane widely to create a tension-free closure. The most medial aspect of the flap should be oriented vertically to reduce the chances of a standing cone. Additionally, a deep inverted triangle may need to be excised inferior to the defect to allow the flap to rotate adequately. The flap is tacked to the medial wall of the orbit medially and the lateral wall of the orbit laterally. Some will place a small vacuum drain in the wound to prevent fluid collection formation [8].

## 2. Objective

To demonstrate that Mustardé's flap can be considered in facial traumatic reconstructive wounds, because of its versatility, simplicity and its aesthetic result.

## 3. Case Report

We present a 26-year-old male patient brought to the emergency room presenting a 2-hour facial wound, patient indicates he suffered an accident on a motorcycle, without his helmet, colliding with the sidewalk, causing a fall and a facial injury. His physical examination showed normal vital signs, patient was alert, active, conscious, and oriented, presenting an avulsive wound in the right maxillary region (**Figure 1**), no active hemorrhage, no bone exposure, Glasgow score was 15 points. X rays were performed, without showing any facial bone fractures. For this reason, the wound was irrigated with sterile water, and covered with wet to dry cure, after completing fasting time and having the test results, he was taken to the operating room for surgical treatment.

**Figure 1.** Emergency room photograph.

The defect was assessed after washing it with iodine soap and saline sterile solution and debrided (Figure 2), it was determined to use a Mustardé flap which has great versatility and good applicability in face defects, preserving functionality and aesthetic of the face. It was also considered because of its straight forwarded performance, avoiding delayed or multiple stage-closures. The flap was performed (Figure 3), two-plane closure was used with 4 - 0 vycril and skin closure with nylon 6 - 0 and steri strip (Figure 4). After the surgery was executed, patient completed a 7-day antibiotic regimen (clindamycin), using non steroid anti-inflammatories

**Figure 2.** Trans operative defect size and Mustardé marking.

**Figure 3.** Trans-operative flap.

**Figure 4.** Post operative surgical wound.

for pain management and also proper wound cleaning every day and flap hydration with mineral oil (Figure 5). Patient was discharged and re-evaluated in the outpatient clinic. At his 8th post operative day stitches were withdrawn and mineral oil was used for the flap hydration. Patient was also evaluated at the two week post operative period, as well at his 45th post operative day (Figure 6) in which scar protrusion was visualized, for which massage over the scar and hydration was reminded. At his third post operative month reevaluation no visible complications were seen. Finally due to a satisfactory evolution the case was concluded at his 6th post operative month (Figure 7).

Figure 5. 4th post operative day.

Figure 6. 45th post operative day.

Figure 7. 6th month post.

## 4. Discussion

Facial injuries become a great challenge for any reconstructive surgeon. Soft tissue defects on the face should be tailored to the unique characteristics of the defect, localization, patient expectations, and surgeon's experience. The ultimate objective of treatment is to achieve functional and cosmetic restoration [9].

Local flaps encompass the skin and subcutaneous tissue directly to a vascular supply, transferred to an adjacent or nearby site. Additionally, flaps have the added benefit of redistributing tension lines around defects [10]. Advancement, rotational, and transposition flaps are considered random pattern local flaps, referring to the arterial blood supply of the flap being derived from perforating musculocutaneous blood vessels within the flap's pedicle feeding into the dermal-subcutaneous microcirculatory plexus [11].

The Mustardé technique has notable limitations to discuss. One involves vascular integrity. Patients with histories of smoking, scar tissue from previous surgeries or radiation, and other risks of vascular compromise to the area have the potential for decreased blood supply to the new flaps [10]. Due to the size, the risk of ectropion is high; therefore, the specific placement of tracking sutures is essential to redirect tension vectors and avoid the distortion of free margins, most notably on the eyelids and nasal alae. Therefore, it is important to consider a patient's history concerning the potential for vascular complications [7]. Cosmetic preferences also influence the choice of repair method. For example, in men with beards, facial hair could move from its usual preauricular location to the cheek region, limiting the Mustardé flap to patients without facial hair. Other disadvantages of the Mustardé technique are the possibility of lower eyelid retraction with scar contracture, ectropion, entropion, and epiphora, as well as risks of facial nerve damage, hematoma formation, and excessive facial scarring [12]. Often, local skin flaps provide the best result with the least morbidity. As described, rotation and transposition flaps can be utilized successfully for facial reconstruction when the flap is chosen correctly and is well designed and executed [13]. Facial reconstruction requires careful consideration of the unique qualities of each facial subunit and the corresponding advantages and risks of each type of reconstructive option [12].

## 5. Conclusion

Plastic surgery is constantly evolving, which leads to surgical techniques innovations and patient approaches. Facial plastic surgery represents an important surgery branch that makes life changing and lifesaving transformations, in which patient's expectations have to be considered. There are many surgical options available for a reconstructive surgeon to use. However, it is essential that each patient has to be assessed and approached individually, considering detailed planning and longtime prognosis, aiming for the best aesthetic outcome.

## Patient Consent

The patient provided written consent for the procedure and the use of the images.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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