



SOFT TISSUE INJURIES OF THE FACE: EARLY AESTHETIC RECONSTRUCTION IN POLY TRAUMA PATIENTS

Plastic Surgery

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ABSTRACT

INTRODUCTION One of the most challenging and common problem faced by the plastic surgeons in polytrauma ward are Facial Soft tissue injuries, which can be completely isolated or be in combination with other injuries. The face consists of several organs and aesthetic units. The final outcome depends on initial wound care and primary repair. So one should know the "do's and don'ts". Disfigurement following trauma, becomes a social stigma and has the gross detrimental effect on the personality and future of the victim. Therefore, such cases are most appropriately managed by Plastic Surgeons who have a thorough knowledge of applied anatomy, an aesthetic sense and meticulous atraumatic tissue handling expertise, coupled with surgical skill to repair all the composite structures simultaneously.

METHOD This study is conducted in the department of Plastic and Reconstructive surgery, SMS Medical College & Hospital Jaipur India from January 2019 to December 2020. 50 patients with history of facial soft tissue injuries who were admitted in the polytrauma ward are included in the study.

RESULTS Seventy-five percent of the facial injuries were repaired primarily and the remainder were reconstructed with skin grafts or local flaps from adjacent tissues. We had no post-operative infection, hematoma, ischemia, or necrosis in our patients and the patients were satisfied after the operation.

CONCLUSION The study concludes that Primary reconstruction should be the mainstay of management and the most important responsibility of the surgeon is to convert the contaminated wound to a clean one and then to perform reconstruction.

KEYWORDS

Facial injury, Facial reconstruction, Polytrauma, Soft tissue injuries.

INTRODUCTION

One of the most challenging and common problem faced by the plastic surgeons in polytrauma ward are Facial Soft tissue injuries, which can be completely isolated or be in combination with other injuries^{1,2,3}. Despite its magnitude, most literature with respect to craniofacial trauma concentrates on fractures.⁴ The literature has not done justice to the importance of early aesthetic reconstruction of the face in patients of polytrauma as it has failed to put requisite emphasis on it.

The patients with facial injuries may witness injury to self-esteem and confidence temporarily or permanently. The aim of management of Facial Soft Tissue injuries is not just functional but also aesthetic recovery in the shortest amount of time. Most of these cases in India come to the casualty after having incorrect and random single layer deep stitches with misaligned tissue. Presence of various foreign bodies and unnoticed hematoma further complicates the case. Due to the complex nature of facial structure, it is very important to anticipate injuries in various structures underneath the surface of the wound. The first chance is most essential crucial in repair as it drastically affects the outcome. The surgeon needs to understand the biochemistry, molecular biology of wound healing, biomechanics of tissue wounding, and the art of soft-tissue repair.

Trauma often leads to complex facial injuries with loss of tissues. Motor vehicle crashes and assault bite wounds are the top two most common causes of facial injuries. Most defects if reconstructed immediately may lead to better restoration of function and form with the help of early rehabilitation.⁵⁻¹⁷ There is a wide range of options for repairing a given defect that includes healing by secondary intention, primary closure, placement of a skin graft, mobilization of local or regional flaps, and free flaps. Local flaps are often responsible for superior functional and aesthetic results in a patient. One of the advantages of local flaps is that the tissue closely resembles the missing skin in both color and texture. These flaps can be rotated, advanced, transposed, or interpolated onto the tissue defects, as the situation demands.¹⁸⁻²² Most of the facial malformations in adults are attributable to early childhood traumas as trauma has deleterious effect on the growth and development of facial bones and structure.

AIM

The aim of this study is to elucidate proper management of facial soft tissue injuries in polytrauma patients.

MATERIALS AND METHODS

MATERIALS

This study is conducted in the department of Plastic and

Reconstructive surgery, SMS Medical College & Hospital Jaipur India from January 2019 to December 2020. The patients with history of facial soft tissue injuries who were admitted in the polytrauma ward are included in the study while patients with severe life threatening CNS, skeletal and other injuries are excluded from it. All patients with soft tissue injuries of the cheek, lip, scalp, ear, nose and eyelids, accounting to 50, are included in the study.

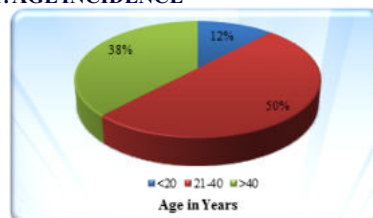
METHODS

The methods comprises of first obtaining a thorough history of patient, mode of injury and site of injury, thorough both clinical examination and necessary investigations. Initial care of trauma patients was done with the help of algorithmic protocol of ATLS (Advanced Trauma Life Support). Proper pre-operative planning was then done before proceeding with the procedure. Patterns & templates were made as per tissue loss at the site of the injury. Digital photographs of the patients were taken pre-operatively, intra-operatively and post-operatively. Immediately after admission, patients were given anti-tetanus Prophylaxis and wound swab were taken for culture and sensitivity. Thorough wound wash was then done using saline and povidone iodine solution. Any foreign body in the tissue was duly removed while dead and devitalized tissue was excised from the site. A course of intra-venous antibiotics was started for first 2-3 days after which oral antibiotics were prescribed.

In stable patients with clean uncontaminated wounds, primary single staged repair or the first stage of the staged reconstruction was done on the day of injury as per the requirement of the case. In patients with contaminated injuries secondary reconstruction was planned. Procedures, complications, outcomes were explained to the patients and informed written consent were obtained from them. Cases were followed up after 1 week, and 2 weeks and then monthly for the period of atleast 3 months post operatively till the final stage of reconstruction surgery.

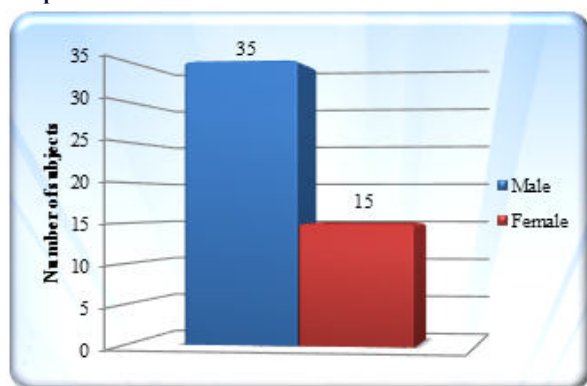
OBSERVATION AND RESULTS

Graph 1.1: AGE INCIDENCE



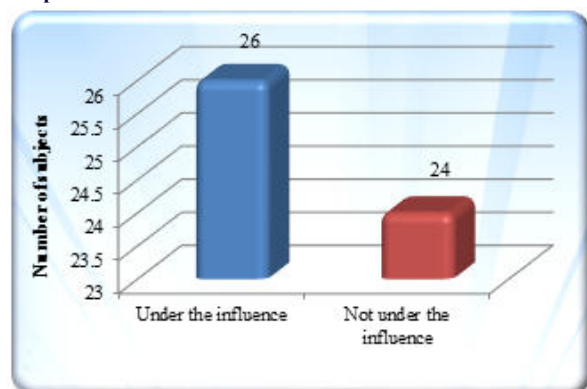
The data shows that about 50% (n = 25) patients belonged to 21-40 years. 38% (n=19) of patients belonged to 41-60years age group and 12% (n=06) of patients were less than 20years.

Graph 1.2: SEX INCIDENCE

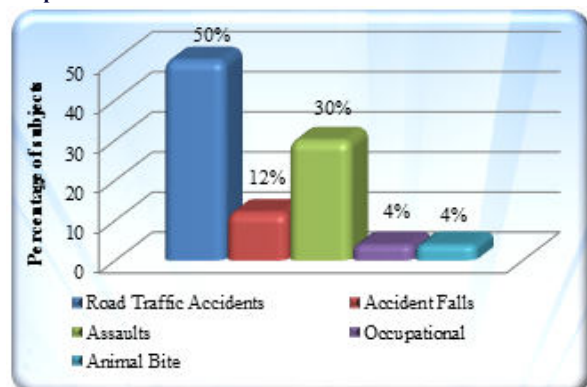


Out of 50 cases 70% (n=35) of patients were males and 30% (n=15) were females.

Graph 1.3: ALCOHOL STATUS OF PATIENTS



Graph 1.4: MODE OF INJURY



Road traffic accidents were the commonest cause for facial injuries contributing 50% followed by assault contributing 30%.

Table 1: Site of Injury

S. No Site of injury No of patients Percentage

Facial Region	Male	Female	Total Number
Forehead	3 (7.9)	2 (4.7)	5
Ear	5 (7.9)	2 (3.17)	7
Eyelid and eyebrow	9 (15.8)	4 (7.9)	13
Nose	7 (12.6)	3 (4.7)	10
Cheek	4 (11.1)	2 (3.17)	6
Lips	3 (9.5)	2 (3.17)	5
Chin	3 (6.3)	1 (1.58)	4

* Data are presented as No. (%).

RESULTS

Overall, 50 patients including 35 (70%) men and 15(30%) women with 88% of age more than 20 underwent facial reconstruction procedure due to soft tissue trauma in different facial zones (Table 1). Sharp wounds were seen in 12 (24%) patients and blunt trauma lacerations were seen in 38 (76%) patients. In both sexes, the most common site of injury was the periorbital area and the least common site was the chin. seventy-five percent of the facial injuries were repaired primarily and the remainder were reconstructed with skin grafts or local flaps from adjacent tissues. We had no post-operative infection, hematoma, ischemia, or necrosis in our patients and the patients were satisfied after the operation. The facial lacerations were managed in the early 24-48 hours after injury. The esthetic results of the patients were evaluated with both clinical examination and comparing the photographs taken at various stages of the procedure.

The final result helped in restoring a sense of normalcy to the face with appropriate sizes and proportions and removal of the signs of visible trauma to a large extent. A meticulous skin closure and a good definitive surgical scar were obtained in every patient. Every time flaps were used, partial or total necrosis was never observed. There was no occurrence of any complication worthy of note.

DISCUSSION

The concept of "damage control" surgery was discovered and introduced for patients with multiple injuries.²³ In this paper, we want to put emphasis on the concept of early aesthetic reconstruction surgery of the face in emergency situations that represents one of many new evolving trends in the care of polytrauma patients. The "Advanced Trauma Life Support" (ATLS) protocol of the American College of Surgeons' Committee on Trauma is the standard procedure algorithm for the management of trauma victims.²⁴ In the soft tissue injuries complexity of these injuries is duly represented in the potential for loss of relationship between the aesthetic subunits of the head and the functional aspect of them.²⁵ The restoration of facial contour after trauma is no different than reconstruction of any form of non-emergency facial asymmetry. The facial wound may be contaminated by foreign material and orosinonasal secretions, and can contain nonviable soft tissues and bone. The cleaning and debridement must be performed very precisely. Before treating the soft tissue the bony foundation must be reconstructed. In facial surgery, the appearance of final scar plays a keyrole. Whether a plastic surgeon is available or not, every surgeon, regardless of the surgical specialty, has to engage to obtain the most aesthetically pleasing incision and the best surgical scar in a facial injury presented in a polytrauma patient.

There are several reconstructive options for facial trauma such as primary repair, skin grafts, regional flaps, local different flaps or distant and free flaps. Size, location, and involvement of deeper structures determine the choice of reconstructive procedure that will be used. Previous scars should be excised and whenever possible, modified as incision sites for the surgical procedures, when facial soft tissue injuries are treated electively. To treat residual defects, the basic surgical strategy is to rearrange the scars to lie in the natural skin folds.

This often necessitates a slight modification of standard flap designs. In addition, modification of the selected surgical procedures is needed to replace all missing elements of the face and simulate the original tissues as much as possible. From the esthetic point of view, this means the facial structures should simulate the original tissue and the adjacent tissues in terms of contour, thickness, color, texture, hair bearing, and skin elasticity and should be in consonance with the adjacent tissues. Functionally, the reconstructed areas should also be able to participate in the normal facial movements, smiling, and speech. Such revisions and secondary operations are often necessary.⁵

A good color and texture harmony with adjacent tissues is a sign of ideal facial reconstruction. It is also desirable to have minimal donor site deformity and hidden scars at the site. Optimal esthetic reconstruction of facial defects is dependent on the availability of donor sites with color, texture, sebaceous quality, and thickness similar to the defective tissues. Over the years, a great number of local flaps, micro-vascular free flaps and pedicle flaps have been employed for the reconstruction of mid-facial defects.



Figure 1: (a) Deep lacerated wound with gross displacement of tissue. (b) pre op (c) cheek advancement flap done with proper placement of tissues by key stitches (d) post op



Figure 2: (A) Left lower eye lid defect post RTA for which Nasolabial propeller flap raised (B) Immediate post op (C) & (D) 1 week post op



Figure 3 : (A) Post traumatic defect involving right eye lateral canthal area with right malar defect (B) After realigning lateral canthal area intra op with key sutures (C) Limberg flap raised for malar defect (D) After inset of limberg flap (E) & (F) 3 month follow up



Figure 4: (A) Post traumatic defect right eye lateral canthal area (B) Rotation flap done for defect closure (C) & (D) post op





Figure 5: (Left) Pre op (Right) post op pictures after tissue adjustment and successfully repaired with proper placement of tissue

CONCLUSION

It is a complex and essential task to restore and repair the function and aesthetics of the face as it is the most important physical feature, for multifarious social interactions in every-day life. Acute wounds with different etiologies present a significant challenge to the surgeons performing reconstruction. When we discuss the ultimate surgical outcome, critical assessment of the nature and magnitude of the wound is of prime importance. Adequate understanding of vascularity and meticulous execution determines the success of the procedure. Locoregional flaps of different combinations and constituents are not just popular but are also of enormous value in managing defects of moderate size. Larger defects often require free tissue transfer. Failure, more often than not, arises from the inability to recognize the extent of the injury, rather than from the inability to treat the recognized injury. The face is the first most important feature of an individual's

appearance.²⁶ Thus, special attention must be paid by surgeons indevising any plan for the reconstruction of the face in polytrauma patients. Unbelievably it isn't uncommon that a polytrauma patient with soft tissue injuries of the face, waking up from coma and asking for a mirror, showing how much the facial appearance is prioritizes by individuals even over the other potential risks.

The study concludes that patients with facial injuries must all be referred to trauma centers with Advanced Trauma Life Support (ATLS). Primary reconstruction should be the mainstay of management and the most important responsibility of the surgeon is to convert the contaminated wound to a clean one and then to perform reconstruction.

Compliance with ethical standards

Conflict of interest Dr. Rakesh Jain and Dr. Nitesh Lamoria declare that they have no conflict of interest.

Ethical Approval

Institutional Ethics Committee has confirmed that no ethical approval is required.

Consent to Participant

Participants in the study consented for the publications of results.

Consent for publication

Upon submission, all authors consent to the publication of the manuscript.

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