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Management of Traumatic Soft Tissue Facial Injuries: Experience at a Tertiary Care Centre in Odisha

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Abstract

Traumatic soft tissue facial injuries are common seen with craniofacial injuries. The face, owing to its prime position in the human body needs more attention, thought and skills while dealing with injuries in this region. The complexity of these injuries is represented by the potential for loss of relationships between the functional and the aesthetic subunits of the craniofacial region and therefore it is important that the repair done justifies both form and function. Different regions of the face demand different surgical management. Through this case series performed at a tertiary care hospital, we try to re-emphasize on the importance of anatomy and the necessary steps needed to manage traumatic facial injuries.

Keywords: Facial trauma; Soft tissue trauma; Maxillofacial trauma; Management

Introduction

Craniofacial injuries are common accounting for almost close to 7% visits to the emergency department [1]. The severities of these injuries are predicted by the trajectories of force, velocity of force, the mode of trauma etc. These injuries can be limited to a soft tissue component or sometimes might involve underlying deeper structures. The complexity of these injuries is represented by the potential for loss of relationships between the functional and the aesthetic subunits of the craniofacial region [2]. The face, owing to its prime position in the human body is the first most visible part and hence it's imperative that the surgeons pay adequate attention while examining such patients in the emergency setup. Severe facial trauma often involves multiple aesthetic units of the face [3]. The importance of early reconstruction of the face in case of trauma cannot be downplayed and every attempt should be made to achieve near perfect results in the first attempt of surgery. The reconstructive process should aim to provide acceptable functional and aesthetic outcomes [4]. The aim of this paper is to highlight and emphasize on the management of soft tissue facial injuries through a series of cases in a tertiary care centre at Odisha.

A total of 3,208 facial injury cases were treated at our hospital in the year 2018 to 2019. Out of which, 943 cases were purely soft tissue injuries. Majority of the cases were in the age group of 20 to 40 years. Males presented with more injures compared to females.

The common causes of soft tissue facial trauma seen in our setup encompasses: (Figure 1).

1. Motor vehicle accidents
2. Falls
3. Occupational injuries
4. Assaults or interpersonal violence
5. Sports related injuries
6. Animal or Human Bites
7. Facial Burns
8. Self inflicted injuries (Rare)

Initial Evaluation and Management

When dealing with simple or devastating craniofacial injures in the emergency department, the

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basics of Advanced Trauma Life Support protocols are strictly to be adhered to. Primarily, the patient's airway is secured and maintained, breathing stabilized, bleeding arrested and cervical spine cleared. If other system injuries are suspected, appropriate services are to be called upon before shifting the patient to the operating room [5].

The wound environment in case of a facial injury is generally hostile and susceptible to infections. More often, these injuries are contaminated with foreign bodies, oral-nasal and sinus secretions. Additional assessment should always be carried out and keen eyes should always look for concomitant intra-cranial, ophthalmologic injuries while addressing injuries in the facial region [3].

The range of assessment should also involve nerve examination prior to administration of an anesthetic. One should meticulously examine and assess the lacrimal apparatus, facial nerve, salivary gland ducts, tarsal plates and the ear apparatus [6-9].

Definitive management and closure of the wound should be instituted as soon as the patient is stabilized and cleared for the procedure. It has been seen that closure of the wound within 12 h or early results in lower infection rates, improves the aesthetic outcome and prevents swelling which might obscure anatomical landmarks [9,10].

Definitive Management

Once the patient is taken up for the soft tissue repair, the wound is opened up and meticulously cleaned with normal saline and betadine. This would wash away any debris or foreign body which can be potential cause for infection or tattooing. One can also consider agitating the area with the help of fingers in order to aid in thorough irrigation [3]. Diluted hydrogen peroxide can also be used to remove dried blood and debris. Dead devitalized tissues should be removed conservatively. The bleeding encountered during the cleaning of the wound can be controlled using direct pressure or at times by identifying the bleeders and tying them off. The use of electrocautery should be reserved as a final option because its use has been associated with poor wound healing [7,11].

The concept of primary closure holds good for minor facial injuries where tissue approximation is easy to achieve with the help of suturing. Smaller wounds or lacerations which can be managed in the emergency department are repaired with the help of local field blocks or regional blocks (Figure 2). Conscious sedation can be considered in case of children and adults who are not cooperative. Ideally, the tissue should be closed in layers and any exposed hard tissue should be buried under the soft tissue drape. This concept of closing in layers provides anatomical alignment of the tissues obliterates the dead space and prevents complications like hematoma, infection, wound dehiscence, tension on the suture line and hypertrophic scarring [12]. Muscle and subcutaneous tissues are approximated, re-aligned and sutured using 4-0, 5-0 absorbable sutures or Polydioxanone Sutures (PDS). Skin layers are approximated generally using 5-0 propylene or finer ones, if available. Closed suction drain can be used in cases of large wounds. This helps in preventing any form of collection on the wound site which in turn lowers the chances of infection.

However, challenges lie with the management of complex facial trauma. These types of injuries can results in significant morbidity and disfiguration [3]. The management of a particular case should be customized according to the case by the operating surgeon. Reconstruction should ideally be designed and planned within each facial aesthetic unit because human facial perception of beauty is not only subjective but is also defined by each of these units [13] (Figure 3 and 4).

Major Anatomical Subunits of the Face

Scalp

Scalp injuries are notorious for their excessive bleeding owing to its rich vascular supply. Smaller lacerations (less than 3 cm) can be closed primarily. However, the reconstruction options for large, open defects include local rotation advancement flaps, skin grafting, pedicled or free grafts [3]. Avulsed and detached scalp tissue can be reimplanted if the patient arrives at the hospital on time. This would however require that the avulsed scalp tissue is preserved in ice.

Forehead

It is one of the prominent aesthetic units of the face. It is important to ensure proper approximation of skin tension lines, hair lines and eye lid margins [3] (Figure 4). Recent advances claim for tissue expansion principles to be promising in managing injuries to the forehead [14,15].

Periorbita

Any trauma to the periorbital area demands a thorough assessment of the globe. Ophthalmologic assessment should always be carried out prior to any intervention (Figure 5). From inside out, closure starts from the conjunctiva, followed by tarsus and skin. It's important to carefully align the grey line and tarsal plate when managing lid margin injuries. Any injury involving the lateral canthus of the eye can be repaired with a canthopexy or canthoplasty [3]. More often, injury to the medial canthal tendon would indicate an injury to the underlying bone and therefore, the hard tissue component should be addressed primarily followed by repair of the son tissue component.

Figure 1:

Figure 2:

Figure 3:

Figure 4:

Figure 5:

Nose

The nose owing to its prime position on the face is very prone to injury. The external soft tissue is assessed for any obvious injuries and a speculum is deployed to examine the internal nose to look for any mucosal laceration, exposed cartilage, bone or septal hematoma [12]. The skin around the nose is repaired by placing key sutures at the rim of the nose before closing the rest. Mobilizing skin on the cephalic portion of the nose can be used to cover small defects. However, larger defects would require full thickness skin graft which can be harvested from post auricular area (preferred generally due to good color match) and local flaps in case bone or cartilage is exposed (Figure 6).

EAR

Any laceration of the auricle which involves the cartilage can be re-approximated using sutures whenever possible. Pressure dressings are given to prevent hematoma formation [16]. Defects not involving the perichondrium are generally repaired with skin grafting or local flaps. Complete avulsion should be repaired immediately using microsurgical re-implantation. Any part of the cartilage exposed, may be excised and primary closure can be attempted. Exposed and contaminated cartilage decreases wound healing.

Figure 6:

Figure 7:

Figure 8:

LIPS

As with wounds in the other areas, reapproximation of anatomical areas of the lip is a must to have a satisfactory aesthetic outcome. Primary closure can be attempted if less than 30% of the lip is involved. However, larger defects would require skin grafting and

local flaps. It's always important to restore the sensory and muscle function [3] (Figure 7).

Caring of the Wound

Regular cleaning and dressing of the wound is mandatory. An ointment helps in keeping the wound moist and prevents scab formation which ultimately helps in the re-epithelization process [3]. Antibiotic ointments are generally prescribed for 2 to 5 days. Simple clean wounds of the face and neck that have been religiously irrigated and derided do not require systemic antibiotics. However, puncture wounds, bite wounds, foreign bodies embedded in wounds, heavily contaminated wounds, jagged wound edges, delayed closure and immunocompromised patients do require a course of systemic antibiotics [17]. Any analgesic can be given for pain alleviation.

Conclusion

Treatment of soft tissue facial injury requires early tissue debridement followed by definitive repair. Critical assessment of the wound is important and would very often help in the treatment planning, thereby, dictating the final outcome. A thorough understanding of the vascularity of the oro-facial region is mandatory prior to attempting such repairs. Immediate reconstruction of most defects often leads to better restoration of not only form and function but also improves the chances of early rehabilitation.

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