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Soft Tissue Injuries Following Road Traffic Accidents and Its Management: An Institutional Experience

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ABSTRACT

Soft tissue trauma following road traffic accidents in India are becoming very common. Face is considered the identity of a human being and so dealing with soft tissue injury can be very challenging for a reconstructive surgeon. The goals of management of facial trauma are the preservation of form and function. Complex trauma with injury to more than one structures of face is important to deal with in an emergency set up. Along with aesthetic component of the face, functions such as mastication , normal vision and facial expressions are also to be considered. This paper highlights few soft tissue injuries of the face following road traffic accidents in tertiary centre in West Bengal and tries to emphasize the important steps required to manage these cases for best outcomes.

INTRODUCTION

The incidence of Road traffic accidents (RTA) in India have risen to 4 ,61,312 per year of which 1,55,781 were fatal accidents [1]. Road traffic accidents involving head and face have also significantly increased. Craniofacial injuries are common accounting for almost close to 7% visits to the emergency department [2] . Trauma to face may be isolated injury in road traffic accidents or may be a part of polytrauma . They may involve Soft-tissue injuries of face only or may have associated fractures[3]. Such injuries can be abrasions, tattoo or deep lacerated wounds which may or may not involve loss of tissues . Facial soft tissue injuries can be simple which may involve breach of skin to complex with exposed facial bones and comminuted fractures . Management of such soft tissue injuries are important as it involves function as well as aesthetics of face . Early reconstruction in such facial soft tissue trauma cases are of utmost importance in order to achieve a normal or near normal function , aesthetics and have minimum morbidity . Facial soft tissue injuries vary in severity based on the impact force and type of injury into minor superficial wounds to massive avulsions [4] .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 . Severe facial trauma often involves multiple aesthetic units of the face [5]. The aim of this paper is to present and highlight the variety of facial soft tissue trauma which we encountered in an urban centre in West Bengal and how they were managed.

PATIENT IN EMERGENCY ROOM

All the patients who suffer facial injuries are initially assessed in the emergency room. Hemodynamic stability is first confirmed . Head injury as well as injury to any vital organs of the body are ruled out .

CLINICAL ASSESSMENT

All patients are examined for any obvious facial deformity, malocclusion and eye movements.
Then all patients with facial injuries are ordered 3D CT scan of face to rule out facial fractures.

INITIAL WOUND CARE

All wounds are assessed under general or local anaesthesia. Thorough lavage is given with normal saline and diluted povidine iodine . Diluted hydrogen peroxide can also be used . All the dirt and debris are cleaned thoroughly. Edges of the wound were assessed for viability . Rubbing with fingers were also done to remove stains if any in the wound. Then definitive management regarding closure of the wound was decided .

SCALP

A 32 year old female presented with complete avulsion of scalp as a result of road traffic accident. She was initially stabilised in the emergency room and then taken for skin grafting as the avulsed scalp was not brought along.

Another male 28 yrs came with lacerated wound in Scalp extending to the forehead which was repaired immediately after stabilising general condition and ruling out any internal injury.

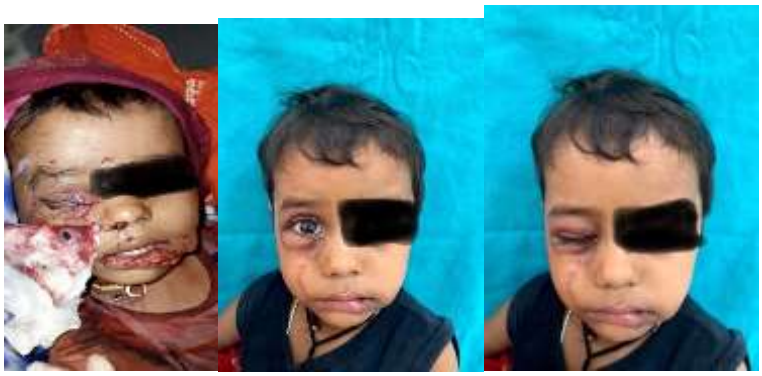
Scalp injuries are common and can present with small lacerations to entire scalp avulsions. Examination of the entire scalp is important as smaller defect can be hidden due to hair . It is mandatory to rule out internal injury to brain before considering for definitive wound management . The reconstruction options for large, open defects include local rotation advancement flaps, skin grafting, pedicled or free grafts[6].

EYELIDS AND PERIORBITA

A 3 year old male presented with injury to the both the eyelids and periorbita with avulsion following a road traffic accident . Thorough examination of the wound was done . Complete ophthalmic examination

was done to rule out any injury to the eye. After ruling out repair was done in layers immediately in emergency . complete function of the lids could be achieved .

Any trauma to the periorbital area especially the eyelids should be followed by a thorough assessment of the globe. Closure should be done mandatorily in layers .minimum 3 layer of closure involving the conjunctiva , then the tarsal plate and the levator muscle and the skin should be done . Sutures should be left long too and tied with subsequent lower sutures to prevent rubbing with the conjunctiva. injury to medial and lateral canthal tendons should also be addressed as it may later cause problems and would be difficult to address .



NOSE

A 25 year old presented with trauma to nose following a road traffic accident. He suffered from communitted fracture of nasal bone with laceration of outer skin. After stabilising his general condition , he was shifted to operation theatre. Local examination revealed a deep laceration on the nose with complete communition of the septal cartilage. Patient was taken under General Anesthesia and via open technique , fracture fixation of nasal bones were done . all the septal cartilage pieces were placed in their position after raising the mucoperiosteal flaps. Then repair of the septum was done with vicryl 4-0. Wound over the dorsum of the nose was closed in layers with 3-0 vicryl and with 5-0 prolene as shown in Figure. Patient was placed under medications and periodic follow up done. On day 10, sutures were removed. 1 month follow up reveals near normal aesthetic and functional outcome of the patient.

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[7] . 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 colour match) and local flaps in case bone cartilage is exposed.

LIPS

A 33 year old male presented to emergency with complete laceration of upper lip with soiling of the edges of the wound. After ruling out any fractures of the facial bones, the patient was taken for repair. Thorough lavage with diluted hydrogen peroxide was given. The edges were freshened . Then repair was done in layers. Inner mucosal layer was repaired with vicryl 4-0, muscle layer was dissected and then repaired with vicryl. Then outer skin was repaired with prolene 5-0. Post op period was uneventful and the sutures were removed on day 6 after adequate healing was confirmed.

Goals of repair of lip should include maintaining proper oral competence, best aesthetic outcome and preventing microstomia or macrostomia. Repair of full thickness lip lacerations requires the careful approximation of all anatomic structures. Often, a small length of the orbicularis muscle needs to be dissected to facilitate muscle repair; failure to repair the orbicularis can result in a whistle deformity. Repair of muscle leads to reduced tension on the subcutaneous structures and mucosa and this allows for anatomic approximation of the philtrum, cupid's bow, vermillion, and white roll.[8] Once the critical landmarks are approximated, the skin and the mucosa can be repaired . Discrepancies in the white roll as little as 1 mm may be visible from speaking distance so care must be taken to be as accurate as possible.

EARS

This 30 year male suffered a near total amputation of the pinna . it was taken to emergency immediately and repaired.

The majority of ear lacerations can be repaired primarily. The blood supply to the ear is robust and the cartilage usually survives if one surface remains in contact with well vascularized tissue. Sutures should be placed to approximate the skin at known anatomic landmarks to prevent distortion of the ear then the rest of the skin repaired. The cartilage does not need to be routinely repaired if the soft tissue envelope repair restores the normal contours. Soft tissue injuries around the EAC can result in stenosis or occlusion of the canal so stenting with an ear wick and instillation of antibiotic ear drops such as ciprofloxacin may be necessary. .

Amputations of the ear provide unique challenges with vascularity. Incomplete amputations should be primarily repaired, and success has been reported even in millimeter thin pedicle remnants. For complete amputations, microsurgical replantation can be considered whenever feasible as this will result in the best cosmesis if there is an adequate vascular pedicle[9]

DISCUSSION

Road traffic accidents have an increasing trend in our country and facial soft tissue injury is more commonly encountered in such accidents . Timely treatment is necessary as necrosis of the soft tissue is one of the major complication encountered with deep or massive soft tissue injury. Because of rich vascular supply of the face, the end result of treatment is most often positive[10]. In children it has been observed that healing response is quick but due to increased collagen deposition in wounds tends to cause hypertrophic scars. Soft tissue wounds can be clean or soiled with dirt . those wounds that are clean or are only mildly contaminated and with little tissue compromise can be closed primarily. Delayed primary repair of Wounds can be done till 24 hours after injury. Older wounds should be debrided first and then thorough lavage should be given and their margins freshened before closure. Blunt trauma may result in extensive and prolonged tissue damage with subsequent deep scarring and poor aesthetics . Contraindications to primary closure in the emergency room include tissue damage whereby primary closure can only be performed under significant tension or with complex tissue rearrangement [11]. Broad-spectrum antibiotic coverage is necessary in contaminated wounds and in patients with impaired wound healing due to smoking, alcoholism, diabetes, or other forms of immune compromise. Tetanus prophylaxis should be given according to the patient's immunization history . In cases such as crush injuries where the extent of injury is unclear, tissues can be loosely reapproximated. A layered closure is critical to obliterate dead spaces and also to relieve tension on the epidermal layer. Ideally, definitive repair of bony and soft tissue injuries can be achieved in a single operation, as successive operations rarely improve functional outcomes . In high- velocity or blast injuries, this is often not possible due to the need for multiple debridements; however, early soft tissue reconstruction should be attempted to prevent significant soft tissue contracture and provide coverage for osseous reconstruction. The presence of contamination has not been associated with an increase in perioperative or long-term complications after early definitive repair of facial injuries with free flaps, therefore contamination should not be considered a contraindication to this treatment approach [12]. Individuals with darker skin pigmentation may be prone to excessive scarring (keloids) and pigmentation changes. Revision of scars should be deferred until final maturation is complete — approximately 6– 12 months postinjury[13].

CONCLUSION

Reconstructive surgeons commonly encounter post traumatic craniofacial soft tissue injuries in their routine medical practice. Key points such as time of presentation in relation to injury, degree of injury, and anatomy involved play critical roles in determining the outcome. Initial inspection should be done

very carefully under bright light and exposure. Swelling , echymosis, oedema, sub-conjunctival haemorrhage, crepitus, hyperaesthesia, evidence of facial nerve palsy, inadequate excursion of the muscles of expression and mastication, wound with or without exposed vital structures and fractures should be a part of initial examination **.** The aesthetic units on the face are frontal, temporal, supraorbital, orbital, infraorbital, nasal, zygomatic, buccal, labial, mental, parotid- masseteric and auricular. Generally horizontal lacerations across the face are likely to damage more vital structures than a vertical injury. Proper matching of the aesthetic units should be of utmost importance in such cases. In deep injury, it is necessary to evaluate communication with oral cavity, nasal cavity, and maxillary or frontoethmoid sinuses. Overall cases of soft tissue injuries of face should be delt immediately and plan should be made according to the structures damaged so that final outcome is satisfactory with less scarring.

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