

# Epidemiology and Management of Facial Soft Tissue Trauma in Calabar, Southern Nigeria

Ozinko M.O., Bassey G.O., Otei O.O., Ekpo R.G., Mgbe R.B.

**Abstract— Background:** Facial soft tissue trauma is a common emergency condition encountered in our Accident and Emergency Department.

**Aim:** several protocols have been adopted in the management of facial injuries; this paper reveals our adopted protocol that works for us as well as the associated epidemiology of facial soft tissue injuries.

**Methodology:** All patients recruited into the casualty department except patients with burn cases were used for this study. Patients were demographically evaluated and their wounds categorized according to their complexity, sites and associated injuries. Management of injuries was in accordance to the American Trauma Life Support (ATLS). The wounds were debrided and treated according to the structures involved. They were managed and discharged with an average of 9 months follow-up period. Some minor complications such as wound infection and scarring were noted.

**Results:** 2016 soft tissue injuries in 1653 were seen in patients from between January and December, 2014, 104(9%) were associated with facial injuries. The sites of the face involved were the frontal area 41(39%), the cheek 24(22.9%), the nose 18(17.1%), the chin 11(10.5%), the eyelids 6(5.7%) and the lips 5(4.7%). The injuries were contusions, lacerations, abrasions and avulsions. About 28 cases, representing 26.9%, had fractures of the mandible, maxilla and the frontal bones as well as fracture-dislocation of the temporo-mandibular joints. 22% had various forms of head injuries. Aetiologically, road traffic accidents constituted 44(45%), falls 42(43.7%), sports 6(6.2%), human bites 6(6.2%) and gunshot injuries 2(2.2%). Fifteen deaths were recorded which were due to massive haemorrhage, airway obstruction and severe head injury.

**Conclusion:** The adoption and application of our management protocol in the management of facial soft tissue injuries has greatly improved the outcome of treatment of facial soft tissue injuries in our facility.

**Index Terms—** Facial Trauma, Facial Soft Tissue Injury, Facial Reconstruction.

## I. INTRODUCTION

Facial soft tissue injuries are common emergency

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conditions encountered in our Accident and Emergency Department. It constitutes about 9% of the accident cases seen per annum. Although rarely life-threatening, the treatment of these injuries can be complex and may have significant impact on the patient's facial function and aesthetics [1]. Facial injuries may present with extremely disfigured appearances which may distract attending clinician from other potentially life-threatening injuries such as closed head injury or cervical spine injury that can be associated with severe facial injuries [2]. Proper evaluation and treatment of the patient using the American Trauma Life Support (ATLS) Protocol is very important. The support of the neck in patients with facial injuries is necessary pending when the concomitant presence of cervical spinal injury is ruled out. The definitive treatment of each wound depends on the severity of the injury, the location and associated injuries [1].

## II. METHODOLOGY

This is a prospective study of all the patients who were managed in our Accident and Emergency Department with facial soft tissue injuries. All facial soft tissue injury patients were recruited into the study except burn patients. The patients were evaluated and their wounds categorized according to their complexity and associated injuries. Special considerations were taken about their incidental medical conditions such as diabetes mellitus, hypertension, asthma, etc which could alter the overall outcome. They were managed using the American Trauma Life Support protocol. After full resuscitation and patient stabilized, with basic investigation results, the definitive treatments were undertaken. All the minor wounds such as lacerations or abrasions were treated in casualty theatre. The avulsion and complex wounds that require airway control and reconstructive surgery were undertaken in the main theatre. The severely injured patients were admitted in the intensive care unit pending when their conditions were satisfactory, for example, oxygen saturation of above 98% under room air. Patients with some soft tissue loss had staged surgeries. The patients with minor wounds were managed on outpatient basis while the severely injured patients who were admitted were discharged after wounds have healed. A follow up period of 3 to 20 months with the mean of 9 months.

## III. RESULT

Out of 2016 soft tissue injuries seen on the body of 1653 patient in the hospital between January and December, 2014, 104 wounds, representing 9%, had facial injuries. The sites of

the face involved were the frontal area 41(39%), the cheek 24(22.9%), the nose 18(17.1%), the chin 11(10.5%), the eyelids 6(5.9%) and the lips 5(4.5%). The injuries were contusions, lacerations, abrasions and avulsions. 26.9% of the patients had fractures of the maxilla, mandible, frontal bones as well as fracture-dislocation of the temporo-mandibular joints. There were 23 patients, representing 22.1%, who had head injury ranging from mild to severe types. Some of the head injured patients had open wounds while others had closed, contused or concussion injuries. Aetiologically, Road Traffic Accidents constituted 45%, falls 43.7% sports 6% human bite 6.3% and gunshot injuries 2%. The age distribution ranges from 8 months to 82 years with the mean of 28±5 years. Road traffic accident was common among those whose ages were between 20 and 40 years. Falls had a bimodal peak, first in children and the aged, above 65 years.

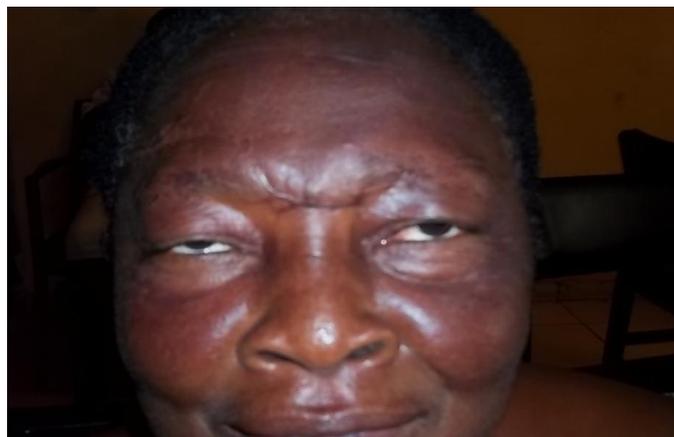
Concerning the sex distribution, male: female is 3:1. The male youths and adults constituted a greater percentage of the accident victims while the male children and the aged females fell more than others. The death rate was 14.4% which was due to massive haemorrhage from major facial vessels, airway obstruction from asphyxia and foreign body impaction at the oropharynx and severe head injury.



Picture 1. Facial Soft Tissue Injury Following A Road Traffic Accident



Picture 2. Five Days After Surgery.



Picture 3. Four Weeks After Surgery.

#### IV. DISCUSSION

Facial trauma is not an uncommon occurrence in our hospital. These are often first seen by plastic and reconstructive surgeons and other trauma clinicians. Facial soft tissue injuries consist of 9% of the soft tissue injuries seen within the one year study period. This is similar to a study that it accounted for 10% of all emergency department visits [1]. The male female ratio is 3:1. Other studies also showed male preponderance [3]. There is a steady prevalence of facial soft tissue injuries due to the growing population and to other human factors such as on – the job accidents, sport- related injuries, domestic interpersonal violence, self inflicted wounds and bites [3] [4].

The exact frequency of facial soft tissue injuries related to sports participation is unknown. Most injuries are reported in males particularly those ages 10- 29 years [5]. The literature on early management of gunshot injury to the face is very scanty which are reported in English Language [5].

Road traffic accident constituted 45% while falls from height was 43.7%. The males within the age of 20-40 years constitute the bulk of the patients with road traffic accident while falls was observed more at the extremes of age. The toddlers were seen to have fallen more among the children population while the patients above 65 years also fell more. These comprised of falls from height among the youths, slipping on tiled floors in the aged and the toddlers falling as they walk or climb on household properties. In developed countries, the leading cause of facial trauma used to be motor vehicle accidents, but this mechanism has been replaced by interpersonal violence, however automobile accidents still predominate as the leading cause in developing countries [6] As many as 50-70% Of people who survived road traffic accidents have facial soft tissue trauma [7]. In vehicle accidents, drivers and front seat passengers are at the highest risk for facial soft tissue injuries [8]. The sites of the face involved are the frontal area 39%, the cheek 22.9%, the nose 17.1%, the chin 10.5% the lips 4.7% and the eyelids 5.7%. The injuries were more distributed along the prominent areas of the face such as the frontal area, the nose, the lips and the chin. In the study 28 patients, representing 26.7% had facial fractures. The bones involved were the frontal bone with depressed skull fracture, the maxilla, the mandible and the fracture dislocation of the temporo-mandibular joints paediatric facial bone fractures are rare. There are several

reasons for the lower incidence of facial fractures in children: the face is smaller in relation to the head, children are less often in some situations associated with facial fractures such as occupational and motor vehicle hazards, there is a lower proportion of cortical bone to cancellous bone in children's faces, poorly developed sinuses make the bones stronger and fat pads provide protection for the facial bones [9]. Twenty-two percent of the patients had cervical and head injuries ranging from mild to severe types. Scalp and brain injuries are commonly associated with facial trauma particularly that of the upper face; brain injury occurs in 15-48% of people with maxillofacial trauma [10]. Concomitant injuries can affect treatment of facial trauma, for example, they may be emergent and need to be treated before facial soft tissue injuries [8]. People with trauma above the level of the collar bones are considered to be at high risk for cervical injuries and special precautions must be taken to avoid movement of the spine which could worsen a spinal injury [11].

The management of the patients starts by using the advanced trauma life support protocol. The primary survey and resuscitation were done to stabilize the patients. The history involved finding out the mechanism of injury, the time of injury, the estimated blood loss and the first aid treatment before arrival in the hospital. The patients were examined for the facial injuries, the extent of injury, blood loss, ecchymosis, bruises, lacerations, avulsion, fractures, numbness or tooth loss and bleeding from craniofacial orifices.

The diagnosis of most soft tissue trauma is clinical. However, radiography of facial trauma is used to rule out facial fractures [12]. Angiography can be used to locate the source of bleeding in some troublesome cases [10]. Computerized tomography scanning is better for detecting maxillofacial fractures and is often needed to determine whether surgery is needed but it is more expensive [9]. CT Scanning is usually considered to be more definitive with better resolution than plain X-RAY in detecting facial bone injuries [7].

We have stated the epidemiology and also outlined our treatment protocol that worked for us. This protocol includes history taking, physical examination, to establish possible mechanism of injury, ensures airway, breathing and circulation are intact, identify source of haemorrhage and control it, identify the exact area of injury and note the depth, check for contamination and the presence of foreign bodies and associated injury, or fracture must be noted. The treatment of the patients depends on their presentation, severity of the injury and associated co-morbid conditions. Although patients with traumatic facial injuries often present with extremely disfigured appearances, they are however seldom life threatening. Each patient with significant traumatic facial injuries was treated on its own merit. The most life threatening problems were addressed first. The patient facial injuries were evaluated after establishing a patent airway, stabilizing the haemodynamics and assessing other associated life-threatening injuries. The use of antibiotics depends on the mechanism of injury, for example, human bite, assault or motor vehicle accident, the degree of injury (superficial or deep) and the concern for devitalized

tissue and the patient's immune status. Important factors guiding antibiotic therapy in each case included whether the wound is related to a bite, the degree of gross contamination, intraoral or sinusoidal mucosal violation and the presence of associated fractures. Tetanus status of the patient should always be verified and anaerobic coverage provided under the above circumstances. Complex facial soft tissue injuries require a multidisciplinary approach with other specialists. Evaluation by an ophthalmologist is needed for any penetrating globe injury, enucleation injury that compromises visual acuity or fracture of the orbital bones. In the event of uncontrollable epistaxis, the otorhinolaryngologist and possibly interventional radiologist are warranted. In head or spinal cord injury, the neurosurgeon is consulted especially in confirmed cerebrospinal fluid leak.

The definitive soft tissue surgery depends on the location of the injury. Isolated soft tissue wounds should be closed as soon as possible, early repair of soft tissue injuries, even in the setting of significant concomitant injuries, has been associated with improved post operative aesthetic results [13][14]. Delay in treatment can result in increased soft tissue swelling obscuring landmarks and making primary closure more difficult. Copious wound irrigation and minimal debridement of tissues is advocated. A layered wound closure is critical to obliterate dead spaces and to relieve tension on the skin. Tissue adhesives such as Dermabond or SteriStrips should be considered in paediatric patients with uncomplicated clean lacerations as they have been shown to be time saving, cost effective and are less painful to the patients [15][16][17]. Specific surgeries to the nose, the lips, the ear or eyelids could vary from simple wound closure to staged reconstructive surgeries. Post operatively; the patients must be closely monitored to ensure proper wound healing, to provide reassurance and to realistically address any concern the patient may have about functional and aesthetic outcome. Follow-up of the patients with severe facial soft tissue trauma is very important to detect complications such as scarring, disfigurement, ectropion, microstomia and possibly scar revision surgery.

## V. CONCLUSION

Facial soft tissue injuries are commonly seen by plastic surgeons as well as other trauma surgeons. The adoption and application of our management protocol has greatly improved the outcome of treatment of facial soft tissue injuries in our facility.

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