



ORIGINAL RESEARCH PAPER

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FACIAL TRAUMA- CLINICAL PROFILE AND MANAGEMENT

KEY WORDS: Facial injuries, facial bones, Soft tissue injury, facial trauma management

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ABSTRACT

Facial trauma is any physical trauma to the face. It is a frequent cause of presentation in an emergency department varying from simple nasal fracture to gross comminution of face. It is often associated with high morbidity. Facial injury can occur as an isolated injury to the face or may be associated with multiple injuries in other parts of body. This work evaluates (1) the spectrum of facial trauma patients, e.g.-nasal bone fracture, mandibular fracture, soft tissue injury to different bony fracture (2) the etiology, clinical features of facial trauma patients and (3) the pattern of management of facial trauma patients. Among 100 patients in this study, majority of them had Road Traffic Accident (RTA) (60%). Maximum number of patients had a GCS of E4V5M6. Soft tissue injuries (40%) and nasal bone fractures (30%) were the most commonly encountered injuries, followed by mandibular (10%) and zygomatic bone fracture (5%). The presenting clinical features of these patients exhibit a huge diversity, ENT bleed (50%) was present in a significant no. of patients. Some of them presents with dyspnoea (5%), head injury (5%). Associated lacerations and external soft tissue injury (30%) was noted in some of them. Majority of these patients were managed conservatively by suturing (50%), ANP (30%). Tracheostomy (10%), Maxillo Mandibular Fixation (MMF) and Open Reduction with Internal Fixation (ORIF) (10%) was done as and when necessary. Most of the facial injuries were due to RTA and is mainly in midface region. Management of facial trauma requires multidisciplinary team approach.

INTRODUCTION

Injuries to the face are relatively common and are the reason for about 10% of all accident and emergency department attendances. Face is one of the most exposed parts of our body and is highly prone to traumatic injuries. Facial trauma can involve soft tissue injuries, bones or both. It is often associated with high morbidity. The facial region can be divided into 3 parts-1) Upper face-frontal bone and frontal sinus. 2) Midface (Lefort-1,2,3)-nasal, ethmoid, zygomatic and maxillary bone and 3) lower face-mandible. It can occur as an isolated injury or may be associated with multiple injuries to head, chest, abdomen, spine and extremities causing both emotional and physical trauma to the patient. The etiology of facial injuries varies with road traffic accident, being the leading cause of facial fracture in developing country like India. Clinical features of nose fracture are epistaxis, external nasal deformity, swelling, pain, septal hematoma etc. Clinical features of orbital fracture include diplopia, restriction of movement of eyes, facial numbness, black eye etc. Clinical features of mandible fracture include trismus, broken tooth, cheek pain etc. Initially, every examination of a trauma patient should follow a systemic approach, typically utilizing the ALTS (ADVANCED TRAUMA LIFE SUPPORT) protocol. Facial injuries in particular should have the examiner on the lookout for airway compromise, uncontrolled haemorrhage and aspiration, as well as concomitant neurologic injury; undiagnosed, these conditions can have disastrous outcomes. Facial trauma accounts for thousands of deaths and financial burden on any country. Facial injuries need special attention due to many reasons. These injuries are with or without head injury and cervical spine fractures or polytrauma. Early airway control requires sound judgment and considerable experience. Skilful experienced personnel are mandatory. In order to have a good outcome with minimal risks and maximal success in airway management, should be in collaboration with the anaesthesiologist or trauma team leader is must [1]. ATLS protocol must be followed in all cases of facial trauma with immediate attention to life threatening injuries [2].

LITERATURE REVIEW

Gruen et al. found that, failure to intubate, secure or protect the airway was the most common factor related to patient

mortality, responsible for 16% of inpatient deaths [3]. The time lag between the injury and surgery is variable depending on primary care institutional protocols and may range from few hours to few days according to associated injury, facial oedema and preoperative optimization of general condition. Resolution of facial oedema during this time allows for more accurate clinical evaluation of airway and ease of intubation. Capasi et al. suggested that the delay in final reconstruction of facial fractures in critically ill patient has an acceptably low complications rate and may be advantageous in decreasing operative risk [4]. Hutchinson et al. addressed six specific situations associated with facial trauma, which may adversely affect the airway: 1. Postero-inferior displacement of a fractured maxilla parallel to the inclined plane of the skull base, 2. bilateral fracture of the anterior mandible, 3. haemorrhage 4. soft tissue swelling and oedema, 5. trauma to the larynx and trachea, 6. foreign bodies - dentures, debris, shrapnel, exfoliated teeth, bone fragments.[5]. Planned reconstruction schedule is required to achieve maximum, satisfactory function and appearance as unnecessary delay in surgery may predispose to complications like malunion and infections. Approach to the facial trauma patient's airway evaluation and preparation is the key to a successful anaesthetic management. Extent of injury, the composition and the anatomy of the injury along with Mallampatti classification, atlantoaxial mobility and thyromental distance provides good airway assessment [1]. But these all may not be accurate in the presence of tissue oedema, disrupted anatomy and muscle spasm. The risk of airway- related complications during the perioperative period was studied by Peterson et al. [6]. They analysed the American Society of Anaesthesiologists Closed Claims database to identify the patterns of liability associated with the management of the difficult airway. They found that complications arose throughout the peri-operative period: 67% upon induction, 15% during surgery, 12% at extubation and 5% during recovery. As with every difficult airway situation, the equipment for difficult intubation should be prepared and ready to use. The approach should be chosen according to the patient's injuries, airway status and the care provider's experience with such equipment and procedures. Management of the airway is a major concern in patients with

facial trauma (gunshot wounds, facial fractures, cervical spine injuries, laryngotracheal injuries) because a compromised airway can lead to death. The method of intubation to use in these patients remains a controversial topic. Although there are many options available, each one has specific indications, and the choice will ultimately depend on the patient's situation and the expertise of the anaesthesiologist [7]. Several studies have explored the association among craniofacial trauma, intracranial injury, and death [8-11]. Although many of these studies were primarily descriptive, they suggested important differences in the outcomes according to the regional facial involvement. Death and intracranial injury have been observed to be increasingly common with the involvement of more superior facial regions [9,12]. Lee et al. [10] had previously found that head trauma after midface fracture is most often minor and postulated that the fragile bones of the midface might act as a cushion for the neurocranium. Mithani et al. [12] expanded on these findings in one of the largest comparative facial trauma series to date and noted that serious head injury was relatively less common in midface fractures overall. However, with bilateral midface trauma, a significant association was found with basilar skull fractures and mortality [12]. Immediate management of facial injuries is required mainly when impending or existing upper airway compromise and/or profuse haemorrhage occurs. Postero-inferior displacement of a fractured maxilla parallel to the inclined plane of the skull base may block the nasopharyngeal airway. A bilateral fracture of the anterior mandible may cause the fractured symphysis to slide posteriorly along with the tongue attached to it via its anterior insertion. In the supine patient, the base of the tongue may drop back, thus blocking the oropharynx. Fractured or exfoliated teeth, bone fragments, vomitus and blood as well as foreign bodies – dentures, debris, shrapnel etc. – may block the airway anywhere along the upper aerodigestive tract. Haemorrhage, either from distinct vessels in open wounds or severe nasal bleeding from complex blood supply of the nose, may also contribute to airway obstruction. These situations should be addressed immediately using various manual and/or instrumental techniques, in accordance with the "A" step in the ABC treatment protocol suggested by the ATLS [1]. Endotracheal intubation should be considered if it was not performed earlier. Soft tissue swelling and oedema resulting from trauma to the head and neck may cause delayed airway compromise. Trauma to the larynx and trachea may cause swelling and displacement of structures, such as the epiglottis, arytenoid cartilages and vocal cords, thereby increasing the risk of cervical airway obstruction. A high index of suspicion, meticulous physical examination and close observation of the patient may assist in the early detection of such situations and facilitate proper and timely management in order to avoid future complications. Once airway management has been completed and all haemorrhage sites controlled, definitive management of bone and soft tissue injuries resulting from facial trauma may be deferred until life- and/or organ-threatening injuries have been properly managed. Early intervention is always needed to improve the prognosis. Airway, breathing and circulation compromises may be affected. It is important to understand the uniqueness of the facial region, both in terms of its anatomy and the neighbouring structures. The team approach to facial trauma should involve ENT Surgeons, general, oral-facial and ophthalmology surgeons for optimal care.

AIMS AND OBJECTIVES

- 1) To evaluate the spectrum of facial trauma patients.eg-nasal bone fracture, mandible fracture, soft tissue injury etc.
- 2) To evaluate the etiology, clinical features of facial trauma patients.
- 3) To study the pattern of management of facial trauma patients.

Compliance with Ethical Standards

Conflict of interest -Authors declare that they have no conflict of interest.

Ethical Approval- All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendmends or comparable ethical standards.

Informed Consent- Informed Consent was obtained from all individual participants included in the study.

MATERIALS AND METHODS

This paper comprises of case analyses of patients who came directly or referred from emergency department of GMCH (Gauhati Medical College and Hospital) to the department of ENT and head and neck surgery for various facial injuries, between January 2020 to January 2021. A total of 100 patients were included in this study irrespective of age and sex. As soon as a case was received, it was recorded medicolegally. The received cases of facial trauma have been reported in the study while categorizing according to the etiology, site of injury, Clinical features, duration of stay in hospital, modalities related to facial trauma. Patients had received initial resuscitative measures by emergency department. Blood samples, CT scan, X-rays were the main diagnostic intervention which had been undertaken during initial primary resuscitation.

RESULTS

Table 1 Etiology of Facial Trauma Patients

Etiology of Facial Trauma	No. of Patients
Road Traffic Accident	60
Physical Assault	20
Fall	10
Sports	5
Gun Shot Wounds	5

The etiology of facial trauma patient was maximum by RTA as patients were 60(60%)

Table 2 Site of Injury of the Patients

Site Of Injury	No. of Patients
Soft Tissue Injuries (Lip Laceration, Ear Laceration)	40
Fracture Nasal Bone	30
Fracture Mandible	10
Associated injuries-Head, orbit	10
Fracture maxilla/Dental fracture	5
Frontozygomatic fracture	5

Soft tissue injuries (40%) and nasal bone fractures (30%) were the most commonly encountered injuries, followed by mandibular bone fracture (10%) and zygomatic bone fracture (5%).

Table 3 Classification of fracture of facial bone of the patients

Facial bone fracture	No. of Patients
Upper face	10
Mid face (Lefort I,II,III)	40
Lower face	10

Most of the fractures located in midface(Lefort II) region.

Table 4 Clinical features of the facial trauma patients

Clinical Features	No. of Patients
Ear, nose and Throat Trauma/Bleed	50
Associated soft tissue injuries, lacerations, bruises, abrasions	30
Subconjunctival haemorrhage, black eye	10

Dyspnoea/chest pain	5
Head injury	5

Among the clinical features ENT bleed is maximum (50%), laceration and external soft tissue injury (30%), dyspnoea (5%), head injury (5%).

Table 5 Different treatments for facial trauma patients due to RTA

Sl. no	Site	Nos. of patients	Stay (Days)	Treatment
1	NBF (undisplaced)	30	5	Injection tranexamic acid, Antibiotics, ANP (anterior nasal pack)
2	Cheek laceration with lip laceration	30	Nil	Primary closure done via suturing
3	Mandible fracture	5	14	Tracheostomy, blood transfusion, reduction with internal fixation, dental opinion
4	NBF with black eye	10	5	Injection tranexamic acid, antibiotics, ANP, Ophtha opinion
5	NBF (displaced) (external nasal deformity (Fig. 1))	10	14	Injection tranexamic acid, Antibiotics, ANP, followed by septorhinoplasty
6	Frontozygomatic fracture with NBF	5	5	Injection tranexamic acid, Antibiotics, ANP, Ophtha opinion, dental opinion
7	NBF (displaced)	10	14	Injection tranexamic acid, Antibiotics, ANP, followed by septorhinoplasty

Table 6 Different treatments for facial trauma patients due to assault

Sl. no	Site	Nos. of patients	Stay (Days)	Treatment
1	Upper lip laceration(Fig. 2)	5	Nil	Primary closure done via suturing
2	Cheek laceration	5		
3	Ear laceration	5		
4	Nasal ala laceration	5		

Table 7 Different treatments for facial trauma patients due to fall

Sl. no	Site	Nos. of patients	Stay(days)	Treatment
1	Ear laceration with fracture tooth	5	Admitted in other department for polytrauma	Primary closure done via suturing, dental opinion for tooth extraction
2	Lip laceration	2		
3	Cheek laceration	2		
4	Ear laceration (Fig.3)	1		

Table 8 Different treatments for facial trauma patients due to sports

Sl. no	Site	Nos. of patients	Stay (days)	Treatment
1	NBF (undisplaced)	3	5	Injection tranexamic acid, Antibiotics, ANP (anterior nasal pack)

2	NBF (soft tissue injury)(Fig.4)	2	5	Injection tranexamic acid, Antibiotics, ANP (anterior nasal pack), soft tissue repair
3	Maxilla fracture (fracture tooth)	1	14	Reduction and internal fixation, dental opinion for tooth extraction

Table 9 Different treatments for facial trauma patients due to gunshot injury

Sl. no	Site	Nos. of patients	Stay (days)	Treatment
1	Mandible fracture(Fig.5)	5	14	Reduction and internal fixation, dental opinion, tracheostomy

NBF-Nasal bone fracture, ANP-Anterior nasal pack

From Tables 5, 6, 7, 8 and 9, It can be observed that majority of the patients were managed conservatively by suturing (50%), Injectables and ANP (30%). Some of them requires tracheostomy (10%) and some requires reduction and internal fixation (10%). More severe is the injury, longer is the duration of stay in hospital.



Figure 1 NBF with external nasal deformity: (a) preop and (b) (postop) septorhinoplasty.



Figure 2 Lip laceration: (a) (preop) upper lip and (b) upper lip repair



Figure 3 Ear laceration: (a) (preop) ear and (b) ear repair



Figure 4 NBF with soft tissue injury: (a) preop and (b) bilateral ANP in situ with soft tissue repair.

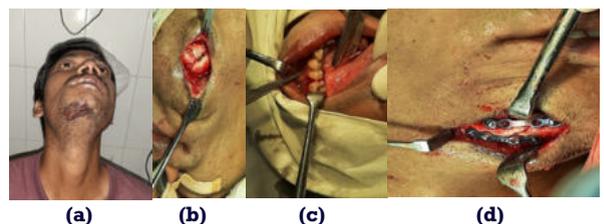


Figure 5 Mandible fracture: (a) preop and intraop (MMF AND ORIF) step (b) 1, (c) 2 and (d) 3.

CONCLUSION

The face occupies the most prominent position in the human body; being the most exposed part, injuries in the face are quite common. Due to proximity of face to both the airway and brain, many of the facial injuries can pose immediate risk to life; nevertheless, each case is unique. Injuries encountered due to road traffic accidents are mainly ENT cases; most of these were to be treated for soft tissue injury and nasal bone fracture. Only few cases required tracheostomy due to airway compromise and a particular case specifically was provided with blood transfusion due to massive blood loss. A few cases involved injuries which required co-operation of several departments, mostly the ophthalmology and dental departments. Facial trauma does have significant psychological impact due to the facial deformities caused by the injuries and efforts are being made to maintain the mental and social well-being of the patients through reconstructive surgeries attempted by surgical teams.

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