

MANAGEMENT OF ORAL, DENTAL AND MAXILLOFACIAL TRAUMA IN THE EMERGENCY ROOM

Irfan Shah

Department of Oral and Maxillofacial Surgery, Dental College HITEC-IMS, Taxila, Pakistan

ABSTRACT

Trauma is a global epidemic. Road traffic accidents, falls, interpersonal violence, sports related and industrial accidents all could and do lead to oral and maxillofacial injuries. If not managed properly, oral and maxillofacial trauma could lead to airway compromise, profuse bleeding, loss of function, disfigurement and death. The purpose of this narrative review article is to highlight the significance of timely management of oral and maxillofacial trauma patients in the emergency room. While the definitive treatment is responsibility of trained maxillofacial surgeons, most of the life and function saving steps could already be taken by the emergency room personnel well before arrival of the specialist surgeons.

Key Words: *Maxillofacial, Dentoalveolar, Trauma*

How to cite this article: Shah I. Management of Oral, Dental and Maxillofacial Trauma in the Emergency Room. HMDJ 2021; 01(01): 33-35

INTRODUCTION

Oral, dental, maxillofacial and the head and neck region are among the most commonly injured parts of human body. Road traffic accidents, falls, interpersonal violence, sports related and industrial accidents all could and do lead to oral and maxillofacial injuries^{1,2,3}. The extent of such trauma ranges from minor dentoalveolar injuries to extensive disruption of the soft and hard tissue architecture of the facio-maxillary region. If not identified and managed properly, these later injuries could cause facial disfigurement (scars and facial deformity), loss of function (mouth opening, deglutition, olfaction, and vision) and prove life threatening due to airway compromise and/ or excessive bleeding.

While the final diagnosis and definitive management of all these injuries is the responsibility of qualified and trained oral and maxillofacial surgeons, quick identification and administration of life, vision and function saving measures must start well before the availability of such specialists. It is therefore mandatory that the emergency room personnel are well versed with the signs and symptoms as well as emergency management of the trauma patients with maxillofacial injuries.

There are countless published scientific articles on definitive management of maxillofacial trauma but only few give guidelines for the emergency room personnel on how to initially manage these patients.

Correspondence to: Prof. Dr. Irfan Shah, Principal, Dental College HITEC- IMS, Taxila Cantt.

Email: drshah121@hotmail.com

Conflict of interest: None

Financial Disclosure: Nil

Received: 27-07-2021

Accepted: 16-08-2021

The purpose of this narrative review article is to give broad guidelines to the emergency room personnel on how to initially manage patients with oral, dental, and maxillofacial injuries.

Basic Principles of Maxillofacial Trauma Management

Diagnosis of most dental, oral, and maxillofacial injuries require detailed history and clinical examination followed by radiological investigations. CT scan is the diagnostic modality of choice for most patients with maxillofacial trauma. In patients requiring CT scan for head injury and having signs of maxillofacial trauma, the exposure should be extended downwards to include the entire maxillofacial region. This will preclude the need for repeat visits to the radiology department for additional exposures later.

Emergency management of all oral, dental, and maxillofacial trauma patients starts with the well-established ATLS principles of ABCDE^{4,5,6}. Using this systematic approach to assess the patient, helps in identification of life-threatening injuries and simultaneously addressing them. Maintenance of airway patency along with protection of the cervical spine, breathing, circulation with hemorrhage control and prevention of disability (neurological, ophthalmological) should take precedence over management of the oral, dental, and maxillofacial injuries. Similarly, the frightening appearance of some maxillofacial injuries must not distract the emergency room personnel from rest of the body of the trauma patient. The entire body of the patient must be examined (exposure) to identify and manage other equally or even more significant injuries.

Airway (with cervical spine) management:

Owing to their direct proximity, trauma to the oral and dental structures predisposes the patient to airway compromises in several ways. Broken teeth or dentures may physically obstruct

the upper airway. Similarly, oral, and nasal bleeding in an unconscious patient in supine position will gravitate towards the oropharynx and obstruct the airway. Bilateral fractures in the para symphyseal region of mandible may allow the central fragment to displace posteriorly^{7,8}. Patient's own tongue in such cases falls back and obstructs the airway. A posteriorly displaced maxillary fracture similarly allows the soft palate to fall back leading to airway compromise.

Prevention of airway compromise in most of these patients is easy and require simple techniques⁹. Supine position should be avoided in patients with oral and nasal bleeding. Putting the patient on his or her left or right lateral side would allow any continued bleeding to flow out rather than accumulating in the oropharynx and obstructing the airway. Cervical spine injury must always be suspected in patients with faciomaxillary injuries and care must be taken to avoid further trauma while positioning or repositioning the patient^{10,11}. Clearing the oral cavity and oropharynx with fingers and /or suctioning will help in removing foreign bodies, broken teeth, dentures, and blood clots. A thick surgical silk suture passed deep through the middle of the tongue is a good and easy way to pull it anteriorly and prevent it from falling back and obstructing airway. Similarly, posteriorly displaced fractured mandibular fragments could be pulled back anteriorly and retained there with simple interdental wiring.

Simple maneuvers like chin lift and jaw thrust and simple devices like nasal and oral airways are extremely helpful in maintaining airway patency. If these simple techniques and maneuvers are not sufficient to maintain airway, expert help must be immediately sought for intubation, cricothyrotomy or tracheostomy. Most oral and maxillofacial surgeons can perform all these procedures. Otherwise, an anesthetist must be called immediately to perform oro-tracheal or naso-tracheal intubation or an ENT surgeon to perform cricothyrotomy or tracheostomy thus securing a definitive airway.

Bleeding and circulation

The entire body of the patient must be carefully examined to identify concealed or revealed hemorrhage. Similarly signs and symptoms of excessive blood loss must be looked for, IV access established, and fluid therapy started to restore circulating volume to prevent or manage hypovolemic shock.

The maxillofacial region is richly vascular and both the soft tissue lacerations as well as osseous fractures may lead to profuse bleeding¹². Tongue lacerations or lacerations involving the facial vessels could lead to intra and extra oral bleeding, respectively. Similarly, displaced, and mobile fractures in the mandibular angle or body region may lacerate the inferior alveolar vessels and lead to profuse intra oral bleeding. Unstable Maxillary fractures may similarly lead to excessive blood loss manifested by anterior and/or posterior nasal bleeding.

The basic principles of achieving hemostasis elsewhere in the body are equally applicable to controlling blood loss in the

maxillofacial region^{13,14}. Identification of the source of bleeding, direct pressure application, application of hemostatic clamps to a bleeding vessel and suturing the lacerations all could prove helpful in securing hemostasis originating from soft tissues.

In mandibular fractures with bleeding originating from the inferior alveolar canal, direct pressure application is mostly impossible. Fragment mobility prevents effective clot formation and hence continued bleeding. A single stainless-steel wire passed around the teeth on either side of the fracture line and tightened to prevent fragment mobility is the easiest way of arresting bleeding in the emergency room. Definitive reduction and fixation or immobilization will be performed later by the maxillofacial surgeon after the patient is hemodynamically stabilized.

Similarly, for maxillary fractures, nasal bleeding could be managed with anterior and/ or posterior nasal packing. While anterior nasal packing is a simple procedure, posterior nasal packing needs knowledge and skills. It consists of passing a Folly's catheter from the anterior nares into the nasopharynx, inflating the balloon and then pulling it anteriorly to exert pressure on the intranasal bleeding point. Combined with anterior nasal packing, posterior packing is an effective way to control hemorrhage associated with midface fractures.

Dento-alveolar and Maxillofacial Injuries

Once airway of the patient with maxillofacial trauma is protected, his/her breathing and circulation restored and the patient is hemodynamically and neurologically stable, attention should be paid to the oral, dental, and maxillofacial injuries that need urgent treatment. Ideally by this time a medical / dental colleague with expertise in maxillofacial trauma management should be available and they will perform detailed clinical and radiological assessment of the patient. In the absence of such expertise the casualty medical officer on duty should perform oral and maxillofacial examination and perform simple procedures that could save vision and prevent loss of function and cosmesis. This will include examination of the oral and maxillofacial region and, depending upon training and experience, preliminary reduction of bony fragments, replantation of avulsed teeth, and initial re-approximation and suturing of soft tissue lacerations.

Orbital fractures are common in maxillofacial trauma patients. While some patients with midface fractures need no ophthalmology consultation¹⁵, others need detailed assessment and management by an ophthalmologist. Vision threatening injuries (e.g., retrobulbar hematoma) must be identified early and managed urgently without waiting for ophthalmologist. Lateral canthotomy and inferior Cantholysis are simple surgical procedures to reduce intra ocular pressure and thus prevent vision loss. All maxillofacial surgeons are trained and can perform these procedures. Same should be the case with most trauma center surgeons.

Avulsed, displaced and luxated teeth need urgent attention as

well¹⁶. Avulsed teeth need immediate replantation. The tooth socket is gently irrigated with saline to remove foreign bodies and blood clot. The tooth is similarly gently irrigated and replanted into the socket. Avoiding touching the root part of the tooth increases the chances of its survival. All replanted and luxated teeth require splinting with dental wiring for stabilization. This part could again be performed better by an expert oral and maxillofacial surgeon.

CONCLUSION

While oral and maxillofacial surgeons are best trained to manage dental, oral and maxillofacial injuries, the emergency room personnel could avoid morbidity and mortality by administering basic life and function saving treatment. Simple maneuvers to establish and secure airway, arrest hemorrhage, and restore circulation prove lifesaving. Similarly, identifying sight threatening orbital injuries, temporarily reducing and immobilizing jaw bones and replanting and stabilizing avulsed and luxated teeth could prove helpful in reducing pain, loss of function and prevent disfigurement.

REFERENCES

1. Shaikh IM, Rajput F, Khatoon S, Usman G. Etiology and incidence of maxillofacial skeletal injuries at tertiary care hospital, Larkana, Pakistan. *Pak Oral & Dent Jour.* 2014;34(2):239-42)
2. Khan SU, Khan M, Khan AA, Murtaza B, Maqsood A, Ibrahim W, Ahmed W. Etiology and pattern of maxillofacial injuries in the Armed Forces of Pakistan. *J Coll Physicians Surg Pak.* 2007;17(2):94-7.
3. Hamid MM, Jabir A, Fathi A, Mohieeldin A, hamid AA. Pattern and etiology of maxillofacial trauma among Sudanese population. *J Head Neck Physicians Surg* 2020; 8:87-90.
4. Deliverska EG, Stefanov LP. Maxillofacial trauma management in polytraumatized patients – the use of Advanced Trauma Life Support (ATLS) principles. *J of IMAB.* 2013; 19(2):282-285.
5. Perry M, Morris C. Advanced trauma life support (ATLS) and facial trauma: can one size fit all? Part 2: ATLS, maxillofacial injuries and airway management dilemmas. *Int J Oral Maxillofac Surg.* 2008;37(4):309-20.
6. Perry M, O'Hare J, Porter G. Advanced Trauma Life Support (ATLS) and facial trauma: can one size fit all? Part 3: Hypovolaemia and facial injuries in the multiply injured patient. *Int J Oral Maxillofac Surg.* 2008;37(5):405-14.
7. Ehrenfeld M, Prein J. Symphyseal and Para symphyseal fractures. In: Ehrenfeld M, Manson PN, Prein J, eds. *Principles of Internal Fixation of the Craniomaxillofacial Skeleton - Trauma and Orthognathic Surgery*, 1st ed. New York: Thieme; 2012:137-146.
8. Kurogi AS, Oliveira e Cruz GA, Closs Ono MC, Maluf J´unior I, Gus IO, Freitas RS, et al. Bilateral para symphysis fracture obstructs the airway? *ACM Arq Catarin Med.* 2012; 41:24-26.
9. Barak M, Bahouth H, Leiser Y, Abu El-Naaj I. Airway management of the patient with maxillofacial trauma: review of the literature and suggested clinical approach. *Biomed Res Int.* 2015; 2015:724032.
10. Hutchison I, Lawlor M, Skinner D, "ABC of major trauma. Major maxillofacial injuries," *BMJ* 1990., 301:595-599
11. Jose A, Nagori SA, Agarwal B, Bhutia O, Roychoudhury A. Management of maxillofacial trauma in emergency: An update of challenges and controversies. *J Emerg Trauma Shock.* 2016;9(2):73-80
12. Cogbill TH, Cothren CC, Ahearn MK, Cullinane DC, Kaups KL, Scalea TM, Maggio L, Brasel KJ, Harrison PB, Patel NY, Moore EE, Jurkovich GJ, Ross SE. Management of maxillofacial injuries with severe oronasal hemorrhage: a multicenter perspective. *J Trauma.* 2008 5(5):994-9
13. Akolkar AR, Kulkarni DG, Gangwani KD, Shetty L, Channe SP, Sarve PH. Bleeding control measures during oral and maxillofacial surgical procedures: A systematic review. *J Dent Res Rev* 2017; 4:79-89.
14. Ardekian L, Samet N, Shoshani Y, Taicher S. Life-threatening bleeding following maxillofacial trauma. *J Craniomaxillofac Surg.* 1993 Dec;21(8):336-8
15. Rockafellow A, Busby E, WuDunn D, Grover S, Salman S Evidence-Based Protocol for Ophthalmology Consult for Orbital Fractures. *J Oral Maxfac Surg* 2021, 79(7):1507-1513.
16. Skapetis T, Curtis K. Emergency management of dental trauma. *Australas Emerg Nurs J;* 2010; 13, 30-34
