

Management of gunshot injury in the maxillofacial region using fiber-optic intubation : A case report

Vyas S*, Pandit M*

Dept. of Oral & Maxillofacial Surgery, Rungta College of Dental Sciences & Research, Bhilai

ARTICLE INFO

Keywords:

Fiber-optic intubation, Gunshot injuries, Naxalite.

ABSTRACT

Treating gunshot injuries is challenging not only in its surgical management but also when it comes to airway management and intubation. Any flaw in airway management may lead to grave morbidity and mortality in prehospital or hospital settings and as well as for reconstruction of fractures subsequently. We present a case of gunshot injury sustained in the maxillofacial region of a policeman injured in Naxalite attack.

Corresponding Author:

Dr. Sunil Vyas

Professor,

Dept. of Oral & Maxillofacial Surgery,

Rungta College of Dental Sciences and Research,

Kohka-Kurud Road, Bhilai, Chhattisgarh, India.

Contact: +919406237260

Email: drsunilvyas@gmail.com

Introduction

According to the estimates of Asian Centre for Human Rights (ACHR), the number of security forces killed in the Naxalite conflict surpassed the number of civilians or alleged Naxalites.

The extent of tissue damage in gunshot wounds depends on the distance from which the gun is fired, missile track, and bullet structure, size and velocity.[1]

Management of the airway is a major concern in patients with maxillofacial 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 anesthesiologist.[2]

Flexible fiber-optic intubation is the technique of choice for management of the anticipated difficult airway with restricted mouth opening and difficult mask ventilation in the patient undergoing an elective procedure.[3-5]

Case Report

A 25 years old policeman sustained gunshot injury during an encounter with the Naxalites. He was shot in the face and had a bullet entry wound on the lower jaw which had shattered the mandible into several pieces. The exit wound of the bullet was in the parotid area. The 3D reconstruction of CT scan showed comminuted fracture of mandible from symphyseal region to the left body region (Figure 1). In mid face maxillary anterior region and buttress region were also fractured. The soft tissue in the area of the bullet entry and

exit had multiple lacerated wounds. Such clinical presentation it posed a great challenge in intubation and surgical management. Fiber optic intubation was contemplated (Figure 2) to bypass those hard and soft structures which were severely traumatized and could not have borne the force of retraction with laryngoscope. After fiber optic intubation thorough debridement was carried out to remove all debris including necrotic elements and shrapnel. After debridement a reconstruction plate was placed extending from right parasymphysis to the ramus of the mandible (Figure 3 & 4). Postoperative healing was uneventful (Figure 5).

Discussion

There are four main steps in the management of patients with gunshot wounds to the face: securing an airway, controlling hemorrhage, identifying other injuries, and definitive repair of the traumatic facial deformities.

Fiber-optic tracheal intubation is an excellent technique for securing the airway in patient with potential cervical spine injuries or with facial injuries. The neck is maintained in a neutral position and the airway is visualized throughout the intubation. The nasal or the oral route can be used. The technique is quick and reliable in skilled hands.[6]

In face and neck trauma, the fiber-optic technique allows the anesthesia provider to evaluate the integrity of the airway. Drawbacks include equipment expense, impairment by blood and secretions, the length of setup time required, and the need for training and experience. For these reasons, fiber-optic intubation is used primarily in the controlled, as opposed to the emergent, setting.

The most common bony injury, in order of occurrence, associated with gunshot wounds to the face include the mandible,

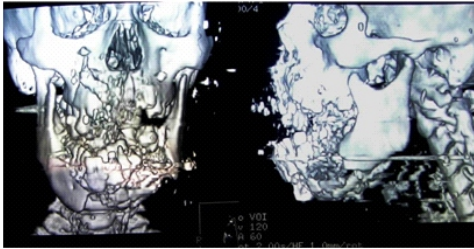


Figure 1: 3-D reconstruction of CT shows comminuted fracture of maxilla and mandible



Figure 2: patient undergoing fiber optic intubation

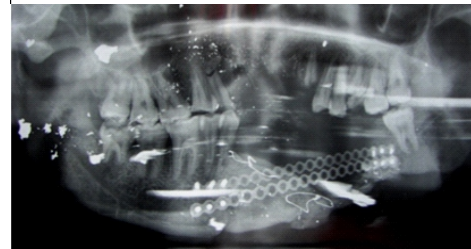


Figure 3: Postoperative OPG

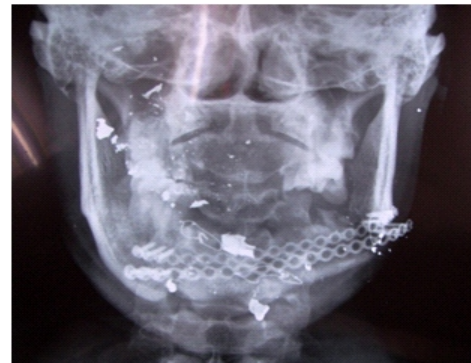


Figure 4: Postoperative PA Mandible view



Figure 5: Postoperative photograph shows satisfactory healing of entry wound.

maxilla, and zygomatic arch.[7] Approximately one-third of patients will require operative debridement followed by fixation.[8] In our experience, 57% of patients required serial debridements. Only after the full extent of the injury has been appreciated and allowed to "demarcate", can reconstruction be considered.

Attempts at immediate definitive reconstruction often fail secondary to loss of mucosal integrity and septic necrosis of the surrounding bone. Traditionally, these wounds were managed with conservative debridement, serial dressing changes, external fixation, and delayed reconstruction. This style of management requires social isolation of the patient for months, scar contracture,

and bacterial colonization of the wound. This requires the surgeon to account for an overall increased risk of infection due to tissue destruction associated with the missile tract, creation of dead-space, retained foreign bodies, and entrapped oral flora. A three-staged approach has recently been championed by Manson.[9] This first stage involves anatomic definition of the tissue and bone loss. After this is quantified by physical examination and computerized tomography, conservative irrigation and debridement can follow systemic stabilization of the patient: serial explorations are the rule rather than the exception. The second general step in management is wound stabilization through restoration of bony relationships.

Dental occlusion is properly established by dividing the face into two halves. The lower half consists of the mandible and maxilla, while the upper half is comprised of the maxilla, orbits, and zygomatic process. Once the occlusal relationship between the maxilla and mandible are optimally established, the upper facial fractures are then repaired. Establishment of an appropriate skeletal buttress allows maximal preservation of function and cosmesis. Early reconstruction provides optimal skeletal stabilization and skin coverage preservation. The key relationships of the upper half of the face include the periorbital rims, zygomatic arches, and the zygomaticomaxillary struts. Bony loss is often bridged initially with metallic struts attempting to prevent soft tissue contracture or collapse with devascularized bone grafts.

References

1. Kihitir T, Ivatury RR, Simon RJ, Nassoura R, Leban S. Early management of civilian gunshot wounds to the face. *J Trauma* 1993;35:575-96.
2. Mohan R, Iyer R, Thaller S. Airway management in patients with facial trauma. *J Craniofac Surg* 2009;20:21-3.
3. American society of Anaesthesiologists Task Force on Management of the Difficult Airway: Practice guidelines for management of the difficult airway: an updated report by the American Society of Anaesthesiologists Task Force on Management of the Difficult Airway. *Anesthesiology* 2003;98:1269-77.
4. Dupanovic M, Fox H, Kovac A. Management of the airway in multitrauma. *Curr Opin Anaesthesiol* 2010;23:276-82.
5. Popat M. State of the art: The airway. *Anaesthesia* 2003;58:1166-72.
6. Ovassapian A, Dykes MH. The role of fiberoptic endoscopy for airway management. *Semin Anesth* 1987;6:93-104.
7. Alper M, Totan S, Cankayali R, Songur E. Gunshot wounds of the face in attempted suicide patients. *J Oral & Maxillofacial Surg* 1998;56:930-3.
8. Demetriades D, Chahwan S, Gomez H, Falabella A, Velmahos G, Yamashita D. Initial Evaluation and management of gunshot wounds to the face *J Trauma* 1991;45:35-41.
9. Robertson B, Manson P. High energy ballistic and avulsive injuries: A management protocol for the next millennium. *Surg. Clin. North Amer* 1999;79:1489-1502.

Source of Support: Nil. **Conflict of Interest:** None