CASE REPORT

**Bullets in the mid facial region over three years: A case report**

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**Abstract**

**Aims and Objectives**- Foreign bodies are often encountered by oral and maxillofacial surgeons and may present a diagnostic challenge, due to many factors such as the size of the objects, the difficult access and a close anatomic relationship of the foreign body to the vital structures. These problems are challenging and involve multidisciplinary evaluation and treatment planning. The aim of this study was to decide whether to take early aggressive management or staged secondary reconstruction which depends on individual patient’s situation as well as extrinsic factors.

**Case Description**- Here is a case report in which radiographic evidence of foreign bodies in the mid-facial region exposed a history involving a gunshot injury. These foreign bodies have remained clinically silent for more than three years. The patient does not have any major complaints relating to the bullet lodged or any symptoms of lead poisoning.

**Conclusion**- Facial gunshot injuries should be managed as other type of facial trauma with initial resuscitation and wound care. Much attention need to be drawn towards the presence of retained lead bullets in the body. Foreign bodies embedded in tissues do not necessary results in clinical presentation. The case presented here is a representation of such a case. Thus, it is important for a maxillofacial surgeon to realize that removal of the foreign body may be considered only if there is discomfort, infection or uncontrolled toxicity.


**Key words**: Bullets, Gunshot injuries, foreign body

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**Introduction**

Gunshot wounds of the maxillofacial region are a rare occurrence during time of peace in Europe. Recently, however, there has been a general increase in number and severity of these injuries. They are mainly caused by suicide attempts, violent conflicts or negligent handling. The face comprises a complex anatomical arrangement of bone and soft tissues so that the severity and extent of injury may range from a simple wound of soft tissues to a severe combined
destruction of the viscerocranium, including the vascular and nervous systems. Even if the gunshot injury itself does not cause major problems, the surgical removal of projectiles can cause damaging of vital anatomical structures. Foreign bodies are often encountered by oral and maxillofacial surgeons and may present a diagnostic challenge to the trauma surgeon due to many factors such as the size of the object, the difficult access and a close anatomical relationship of the foreign body to vital structures. Traumatic injuries often drive foreign objects into the human body. A foreign object in the body causes infection and toxicity. Some foreign objects remain isolated by encapsulating themselves with a granulation tissues reaction and pose very little danger. Although the incidence of gunshot wounds to the face as well as penetrating spinal injuries has increased during past decades, craniofacial injuries caused by missiles are not generally as common as they are in other areas. Given that the presence of a foreign body like a bullet would cause infection and poisoning, this is an unusual case in which the foreign objects have remained asymptomatic for more than three years.

Case report

In October 2008, a 21-year-old Female reported to the emergency department of Indira Gandhi Medical College and Hospital for management of a gunshot wound to her face. A call was made to the Department Oral and Maxillofacial Surgery at H.PGDC Shimla. On arrival, the patient was conscious, walking, anxious, and complaining of facial pain and nasal bleeding and bleeding from the orbital region. Upon questioning patient could not recall what had actually happened. The patient stated that the she had gone to the nearby forest to collect wood when suddenly she felt pain and blood tinged mud all over her face. Firearm used was a handgun at long distance. Physical examination revealed small pin sized holes over the maxillofacial region (Fig1). There were signs of damage to orbital contents. The patient was in good general condition, with pulse of 78 beats per minute and blood pressure of 110/82 mmHg, without signs of respiratory distress, haemorrhage, significant haematoma, retropharyngeal oedema. Radiography of the skull in posterior–anterior (PA) projection and water’s view (Figure 2) revealed location of the foreign body all over the mid-facial region involving the right orbital region. After consultation with the department of ophthalmology patient was operated and enucleation of the right side of the eye was done under general anaesthesia. After six months of surgery artificial eye prosthesis was given. There were no radiographic signs of damage to surrounding bone elements. CT scan was not available. The injury was managed with conservative debridement, after series of wound dressing changes, two weeks of permanent monitoring, and antibiotic therapy, patient was discharged from the hospital as there was no sign of infection or neurological changes. The patient underwent regular follow-up for three year and no complications were observed. She was also advised regular check up in future.

Fig. 1: Pellets wound in mid-facial region and Artificial Eye prosthesis
Discussion

Firearm related injuries are the second leading cause of injury-related deaths in the United States. More than fifty percent of all gunshot injuries are related to suicide attempts, and approximately fourteen percent of all gunshot-related assaults will result in maxillofacial injuries. Although there has been an increase in the incidence of gunshot wounds to the face, missile related craniofacial related injuries are still not as common as those to other regions of the body. Gunshot wounds result from the transmission of kinetic energy from the bullet to the tissue with which it collides, with greater projectile speed leading to the greater damages. The initial wound depends on the impact of the bullet, with the occurrence of an air pressure wave within two milliseconds that distends the tissue, forming a temporary spindle-like pulsating cavity four fold larger than the bullet. The pulsation of the temporary cavity aspirates bacteria from the skin to the interior, characterizing an additional source of infection. To penetrate the skin, the bullet need to be travelling at velocity 50 to 70 m/s, which causes, abrasion to the dermis and epidermis. Bullet injuries are divided into high-velocity and low velocity. A high velocity bullet is likely to lead to quick and fatal injury to the victim, whereas a low velocity bullet may result in a non-fatal injury. It is therefore, more likely that oral and maxillofacial surgeons will encounter low-velocity bullet injuries to the maxillofacial regions. Low velocity firearms mainly include hand guns and shotguns. Low velocity injuries differ from those of other missile injuries owing to the large spectrum of damage, the pallets scatter as they hit and travel through the body, thereby multiplying the damage along its course. The pathological effects of the gunshot wounds will depend not only on the calibre of the weapons but also on the quantity of energy transferred; rate of transmission and energy flux, which is influenced by the range of shot; type of shot; impact velocity; and body tissue resistance. Craniofacial trauma associated with gunshot injury typically involves both functional and aesthetic deformities, leading to mental and social problems. Immediate reconstruction or serial debridement and delayed closure for secondary reconstruction have been advocated. For some patients with localized damage and few complex deformities, immediate surgery with bone and soft tissue reconstruction is indicated to obtain rapid recovery. However in most severe gunshot injuries, the damage and deformities are complicated and extensive, thus require prolonged care and management. These problems are challenging and involve multidisciplinary evaluation and treatment planning. The decision whether to take early aggressive management or staged secondary
occur due to appropriate treatment planning and a well-experienced treatment team. In this case from the patient’s history, it can be deducted that the weapon used must have had a very low wounding capacity. The home made hand gun, may be considered to be the most primitive kind of firearm. It carries pellets detonated by gun powder in a ratio enough to strike the target at high velocity causing serious damage. This high velocity shot from such a weapon at a close range would thus be fatal, but in our patient’s such circumstances were not seen. Hence, we assume that the charge gun powder proportion must have been so high that the explosion of the small amount of the gunpowder did not allow the pallet to gain sufficient velocity to overcome the resistance of the subcutaneous tissues, resulting in a cone like spread of bullets with a heavy concentration of them in the right facial region with no evidence of fatal exit region- causing them to remain lodged in the maxillofacial area. Management of such an asymptomatic patient include periodic follow-up with measurement of whole blood lead level. The patients must be advised to have a diet rich in vitamin C, calcium and iron as these decreases absorption of lead. If the lead level to almost toxic level, then administration of chelating agents with the removal of the source of lead is recommended.

Conclusion
Facial gunshot injuries should be managed as other type of facial trauma with initial resuscitation and wound care. Much attention need to be drawn towards the presence of retained lead bullets in the body. Foreign bodies embedded in tissues do not necessary results in clinical presentation. The case presented here is a representation of such a case. Thus, it is important for a maxillofacial surgeon to realize that removal of the foreign body may be considered only if there is discomfort, infection or uncontrolled toxicity.

REFERENCES