INTRODUCTION
Patients who sustain firearm injuries to head and neck region face heavy tissue damage and eventually life threatening conditions. Knowledge of path of the bullet and how it terminates is critical for expeditious assessment and optimal management of patients with firearm wounds. The extent of tissue damage depends on internal lacerations, the compression of the tissues and the temporary cavitation along the projectile path. The severity of the bullet wound also depends on the extent of involvement of the viscerocranium and is characterized by an irregular path and localized destruction of bones with associated effects.[1]

The diagnostic aspect of firearm wounds comprises comprehensive X-rays and CT scan for a complete picture. In all gunshot wounds, treatment should be individualized as there is no set protocol for head and neck firearm injuries. The operative treatment depends upon the injury and removal of a possible projectile. Careful observation and clear description of the wounds prior to the commencement of surgical procedures and careful handling of possible evidences are the responsibilities of the surgeon in addition to care of the victim.

MATERIAL AND METHODS
Four cases of firearm injuries in head and neck region have been analysed. The first case concerns a retained bullet in infratemporal fossa. Entry of bullet was from right lateral nasal wall making a 0.5 × 0.4 cm oval wound with inverted lacerated margins and crossing left orbit and then finally lodging in left infratemporal fossa [Figure 1], [Figure 2]. During its course it damaged left orbit causing blindness and painful eye. Patient was immediately taken to operation theatre and operated under GA. Per orally an incision was made at gingivobuccal sulcus from 2nd molar to maxillary tuberosity and an effort was made to retrieve the bullet but failed. Then an other incision was made at infra orbital region about 5 mm below the lower eye lid and mucoperiostium was raised and orbital fat was pushed up. Bullet was seen projecting from floor of orbit. It was pushed down from orbit and a 3 cm long bullet was delivered from initial peroral incision [Figure 3]. Both wounds and the entry wound were sutured and dressing done. Post operative period was uneventful.

The second case was 30 years old male presented with parotid fistula caused by firearm about 7-8 days back. The gun was directed on face and fired. Resultant bullet entered through
left cheek near angle of mouth making a 0.5 × 1.0 cm. lacerated wound with inverted and ragged margins. Proper assessment for nature of path and injury was made with plain X-Rays and CT scan of head and neck region [Figure 4], [Figure 5] which showed multiple small pallets in left parotid region as well as in retromandibular and submandibular region. So it was evident that after entry the bullet dispersed into multiple pallets which lodged in parotid gland, retro mandibular and submandibular regions giving rise to parotid fistula. Inspite of being in close vicinity of facial nerve it did not damage or paralyze the nerve. Left stenson’s duct recanalisation was done. Post operative period was good with excellent followup.

Third case we report was a 30 years old female patient presented with left postauricular sinus and facial nerve palsy for 2 years. There was no positive history of firearm injury and on examination a postauricular sinus with lower motor type of facial nerve palsy was present. Preoperative assessment was made with CT scan of mastoid region [Figure 6], [Figure 7] revealing multiple pallets in left mastoid and neck region almost in close vicinity to facial nerve as well. Mastoid exploration was done and 3 pallets were removed which were lodged at sinodural angle [Figure 8], mastoid tip and one just close to angle of mandible anterior to the sternocleidomastoid. After removal of pallet from sinodural angle, CSF leak was found which was sealed with a piece of temporalis fascia. Post operative condition was fair but facial nerve functions did not improve since it was an old injury.

Fourth case was an adult male who presented with history of gunshot injury 6-8 hours back and bleeding from mouth. On examination a large lacerated wound was found in oral cavity at right retromolar trigone and anterior tonsillar pillar. As par attendants the bullet was fired keeping the nozzle of gun in mouth. The bullet entered through right retromolar trigone and anterior tonsillar pillar to finally lodge in right parapharyngeal space near mastoid tip. A very interesting thing was that, in spite of this dangerous course it did not cause any injury to the major vessels and nerves. The bullet was removed from external approach and oral wound was also repaired. Post operative condition was fair with uneventful follow up.

DISCUSSION
It is important for trauma surgeons to understand the basic principles of terminal gunshot ballistics and the study of the projectiles effect on striking soft tissue. For eg. the higher the velocity, more will be the likelihood of extensive damage. A firearm is any instrument which discharges a missile by the expansive force of the gases produced by burning of an explosive substance. The injuries produced by firearm vary depending on the nature of projectile, the muzzle velocity, distance of the firearm from the body at the time of the discharge, the angle of firing and the part of the body involved. The material from which the projectile is made however, is directly related to the amount of tissue destruction.[2]

Bullet wounds, in contrast to wounds caused by blow or impact to the viscerocranium are characterized by an irregular path, entry and exit wounds as well as localised demolition of bones with the associated effects.[3]

The wounding capability of missiles is produced by the tremendous energy absorbed by the tissues. This energy can effect significant injury to structures distant from the wound tract as well as the destruction of neural tissue within the tract. As a result of this energy transfer, cavitations and damage due to secondary projectiles can occur and extensive removal of debris may be required in such cases. While low velocity projectiles usually cause minimal wounds, high velocity projectiles can cause large, devastating wounds.

Diagnosis of firearm injuries includes comprehensive X-rays of the areas involved which reveal radio opaque bullets or pallets, like in our first case plain X-rays of skull revealed...