

## An unusual case of firearm injury to the face with bullet cover lodged in the nose\*

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### SUMMARY

*We report an unusual case of an accidental firearm injury, in a 35-year-old male firearm trainer, by a bullet cover fired in a retrograde manner, which was lodged in his right nasal cavity just reaching sphenoid sinuses without any neurological impairment. The extent of tissue damage and posterior extent of tract was assessed by plain radiography and CT scans. The bullet cover was recovered under endoscopic guidance and the wound sutured with a small defect left for healing by secondary intention keeping in mind second stage reconstruction of the persisting defect. On follow up the wound had healed with good esthetic results. The case showed that gunshot injuries can be treated primarily as well that undermining of the edges of wound and regular well-lubricated dressings are key to good healing.*

*Key words: firearm injury, bullet cover, nose, treatment, gunshot*

### INTRODUCTION

Facial gunshot injuries are unusual and complicated clinical entities. The incidence of gunshot wounds to the face has increased during the past decades<sup>(1-3)</sup>. Over the past decade, 1500 Americans have died annually from accidental gunshot wounds. Accidental gunshot wounds accounted for 20% of all nonfatal firearm related injuries<sup>(4)</sup>. There is controversy regarding the ideal time and method of reconstruction<sup>(5-7)</sup>. Some authors believe that because of the mechanism of injury, early aggressive primary reconstruction might not be ideal. Initial conservative management followed by a staged secondary reconstruction could be performed to obtain satisfactory functional and aesthetic results<sup>(5)</sup>. Alternatively, other authors advocate early management of facial deformity<sup>(6)</sup>. However there is consensus about the four main steps in the management of patients with gunshot wounds to the face: securing on airway, controlling hemorrhage, identifying other injuries, and repair of the traumatic facial deformities<sup>(1,9)</sup>.

### CASE REPORT

We present an unusual case of a 35-years-old male firearm trainer in the army of KSA, who presented in the casualty of KFMMC on 3<sup>rd</sup> of November 2007 with a gunshot injury to the face resulting from a firearm fired in a retrograde manner.

On arrival, the patient was conscious, walking, anxious, and complaining of facial pain, nasal bleeding and blurred vision in his right eye with excessive tearing. He did not have any history of loss of consciousness or vomiting.

On examination he was fully conscious, oriented, hemody-

namically stable without any active hemorrhage or neurological deficit. Examination of his face revealed a laceration of the tip of nose with full thickness skin loss about 1 x 1 cm over the right nostril with burned out edges, a small pedicle of ala still present there (Figure 1) while the bullet cover could be visualized lodged in the right nostril. There was mild postnasal bleeding. Small pledgets were seen lodged in skin of face on right side. On ophthalmologic assessment a foreign body in the right eye was seen with associated congestion.

X-ray of the nose (AP and lateral view) showed the bullet cover lodged in the right nostril, with no evidence of fractures.



Figure 1. The entry wound of the bullet cover with laceration of the tip of nose with full thickness skin loss about 1 x 1 cm over right nostril with burned out edges, also pledgets can be seen lodged in cheek.



Figure 2a. X-ray nose lateral view showing bullet cover lodged in the right nostril just reaching sphenoid sinus.



Figure 2b. CT scan of head & sinuses showed a bullet cover in right nostril just reaching sphenoid sinus

A CT scan of head & sinuses showed the bullet cover in the right nostril just reaching the sphenoid sinus (Figure 2a, b), as well as mild opacifications of both maxillary sinuses but no evidence of a fracture or any intracranial or cervical injury.

The patient was admitted in department of ENT. Under general anaesthesia, using 30° and 70° scope the left nostril was inspected: the nasal mucosa was intact, septum was deviated to the left side, and the base of bullet cover was seen through posterior choana on right side. The bullet cover was identified & removed by pulling with an artery clip with some difficulty (Figure 3), minimal blood loss was suctioned. Because of bullet cover septal mucosa on right side was raised and > 40% of

middle turbinate was macerated. Septal mucosa was repositioned; Septum was repositioned using nasal speculum. The alar defect was closed by approximation of the surrounding skin after undermining and the defect was repaired by placing a guiding suture without tension. A round defect about 0.6 x 0.5 cm was left for healing with secondary intention keeping in mind the possibility of a second stage reconstruction in case of a persisting defect. Bilateral internal nasal splints inserted. Bilateral merocel packs were inserted. Surgery went smoothly with no complications.

A foreign body was removed from the right eye without any complications and leaving the patient with 6/6 vision.

On the 3<sup>rd</sup> postoperative day the nasal packs were removed: There was no active bleeding or CSF rhinorrhoea, the wound was clean and the defect was reduced by more than 50%.

Well-lubricated open dressings were applied on alternate days to prevent crust formation. The splint was removed after 2 weeks; by then the wound had healed by 80% and both nasal cavities had healed well without any stricture or septal perforation. On 4 months follow up the wound had healed completely (Figure 4). No external nasal deformity could be seen. Both nasal cavities and septum had healed well. There was only small synechiae on the right nasal cavity between the septum and the remnant of middle turbinate

## DISCUSSION

The extent of tissue damage in gunshot wounds depends on the distance from which the gun is fired, the missile track, and the bullet structure, size and velocity<sup>(9-12)</sup>. In our case the velocity of the bullet cover was not high as it was fired in a retrograde manner and the size of bullet cover was very big, which explains why it did not penetrate enough to reach deeper structures. However, because of its size and velocity there were thermal burns around the bullet cover entry.

According to Bailey, the defects of nose tissue loss of < 5 mm<sup>2</sup> can be repaired primarily, whereas those > 5 mm<sup>2</sup> are best repaired with composite auricular grafts or local flaps or skin grafts. Alar rim defects are most difficult to repair and the thin epithelial sleeve make this area vulnerable to notching and contour irregularities following reconstruction<sup>(13,14)</sup>. Local wound care post operatively is of utmost importance. By keeping the wound bed moist and preventing formation of dry eschars, prompt and complete healing can be achieved. Lubricated dressings may reduce the risk of infection and have been shown to increase the speed of epithelialisation because if kept moist epithelium seeks a plane of migration with a critical humidity<sup>(15)</sup>. Guiding sutures can be employed to partially close small defects and allow the remainder to heal secondarily<sup>(13)</sup>.

We demonstrated that early intervention can give good results<sup>(6)</sup>. Undermining of the edges of wound and regular lubricated dressings are key to good healing<sup>(13-15)</sup>. We were able to keep



Figure 3. Bullet cover removed by pulling with an artery.



Figure 4. Completely healed wound seen at 4 months follow up.

the wound in good condition by applying well-lubricated dressings thus preventing crust formation, and this helped in the epithelialisation of wound. Avoiding the crust formation prevented dipping/ notching of the skin of nasal tip.

#### CONCLUSION

The present case is unusual in the sense that it was caused by a bullet cover fired in a retrograde manner.

Although we found more than 100 recent case reports of gunshot injury to the face our case is the first describing the injury caused by a bullet cover fired retrogradely. We demonstrated that early intervention can give good results.

Undermining of the edges of wound and well-lubricated dressings on alternate days are key to good healing.

From the case we can also emphasize the importance of teaching principles of ballistics along with firearm training to the soldiers, so that such incidents can be avoided.

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