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Case Report

Late endoscopic removal of a bullet in the orbital apex

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ABSTRACT

We report a case of gunshot injury causing bullet embedded in the left orbital apex via entry point at left eyebrow with immediate left visual impairment. The exact location of bullet was identified using computerized tomography scan and the bullet was removed via endoscopic approach. The case showed the management of bullet removal with endoscopic guidance to minimise the injury to adjacent structure and for better cosmetic outcome without any external incision to the face. In the current case report the bullet was removed via endoscopic approach. Endoscopic removal of bullet in the orbital apex causes less local damage, less bleeding risk , better wound healing, and better cosmetic outcomes.

Keyword: Gunshot wound, Bullet, Endoscopic, Ethmoid sinus, Orbital apex

INTRODUCTION

Gunshot injuries cases are used to be relatively uncommon compared to other source of injuries however the gunshot cases have been increasing globally for past few decades in view of increasing urban violence. A retrospective study of about 4100 bullet injuries showed that overall mortality of gunshot injuries was 11%. 67% of the patients suffered an injury to the craniofacial skeleton and 75% of these patients required surgical intervention.[1] Gunshot wounds can be divided into low-velocity and high-velocity.[1] The high-velocity gunshot wounds usually cause more serious damages including extensive tissue damages, fractures of the facial bones, cavities in the mouth, and severe vascular and nerve damage. The damages caused by low-velocity bullet usually are less severe and less complications if compared to high-velocity bullet injuries. There are various of approaches when come to cases of gunshot injuries ease of access and cosmesis should be considered when deciding the best surgical approach for the facial region the function and cosmetic should be put under consideration to decide the best surgical approach for the patients especially the bullet injuries involving facial region.

CASE REPORT

A 22 year old male, was shot in the face by an unknown assailant and the bullet entered through his left sided eyebrow. He had no loss of consciousness but he had left sided epistaxis and immediate left visual impairment. Assessment by the ophthalmology team showed right eye visual acuity of 6/9 and left eye visual acuity of 1/60. The range of motion of his left eye was restricted laterally. There was left eye complete ptosis, proptosis and the intra ocular pressure of left eye was normal (20 mmHg). Left optic disc was pink and with well- defined margin, commotio retinae involving macula, pre-retinal haemorrhage, and vitreous haemorrhage. Left pupil 5 mm, non-reactive and relative afferent pupillary defect (RAPD) positive. There is a wound at the left lateral eyebrow indicating a possible entry point left lateral eyebrow. X-rays and computerized tomography (CT) scan was done immediately after primary and secondary survey was completed. The CT showed a circular

hyperdense foreign body seen near the left orbital apex, left lamina papyracea and posterior ethmoidal air cells.

Figure 1: Bullet seen from the X-ray.

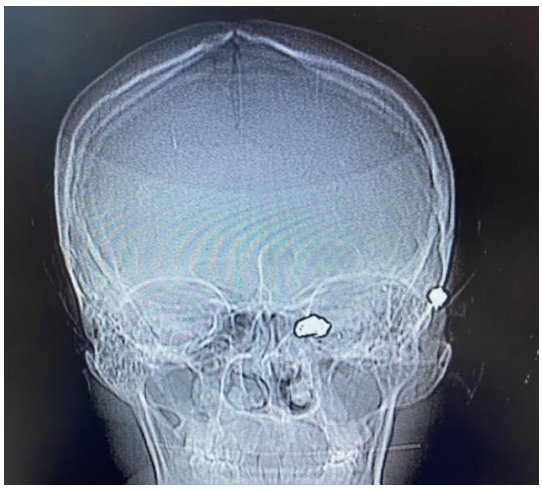

Figure 2: Bullet seen from the anteroposterior skull X-ray.

Figure 3: Bullet seen from the CT scan.

At that time, patient was given option between surgical intervention and conservative management.

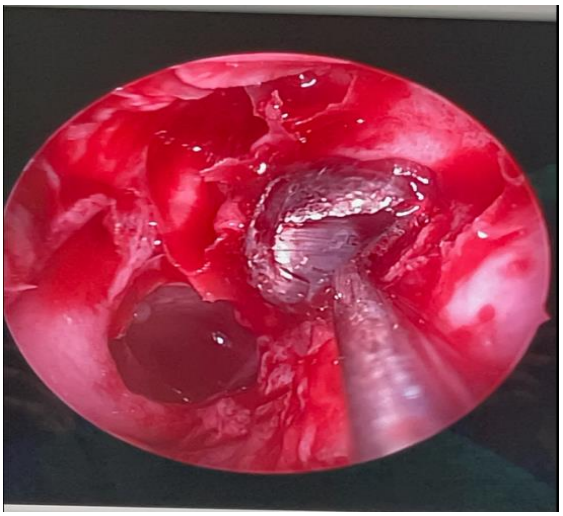

Figure 4: Bullet seen from lateral skull X-ray-endoscopically view of the bullet within the orbit.

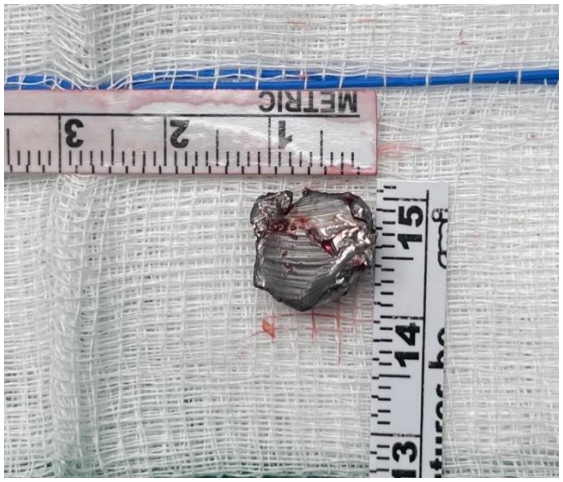

Figure 5: Size of the bullet taken out.

Patient decided for conservative management first with steroid and antibiotic comotio retina and vitreous haemorrhage resolved. His vision worsened to counting fingers 6 weeks later, and ORL team was called in for review. Upon review, he did not have anymore epistaxis since the incident. But he did have occasional left nasal blockage. Upon examination, there is a well-healed scar seen over left lateral eyebrow. Nasoendoscopy showed right inferior turbinate hypertrophy, normal visualised mucosa with no bleeding or foreign body seen. As the foreign body was located within the left posterior ethmoid sinus, abutting the orbital apex medially, an endoscopic approach was preferred over the conventional open approach.

Intra-operatively, uncinectomy, anterior and posterior ethmoidectomy was performed, followed by removing the anterior face of sphenoid sinus. The lamina papyracea

was traced posteriorly until the orbital apex and the bullet was identified. It was located within the posterior ethmoid air cells, breaching the lamina papyracea and causing a defect in the posterior part of the medial rectus. The bullet was surrounded by fibrotic tissue. There were also small fragments of the foreign body measuring less than 2 mm in the surrounding area which was also removed. Post-operatively, left eye visual acuity improved to 1/60 with improved left eye movement laterally. Patient was discharged well one day post operatively. The surgery was uneventful and patient was discharged well one day post operatively. Prior discharge, the left eye visual acuity was 1/60 with improved left eye movement laterally.

DISCUSSION

A complete round of ammunition includes the bullet, the cartridge case, the powder, and the primer. Bullet is the portion of the round that is protruding from the end of its cartridge case and leaving the end of the gun barrel after firing.[2] Therefore, a gunshot wound is caused by the bullet or its fragments. A foreign body to be found in the frontal and ethmoid sinuses are more uncommon compared to maxillary and sphenoid sinuses.[3] A foreign body in the paranasal sinuses can enter by direct injury or via indirect routes such as orbital or palatal. Endoscopic removal of foreign body usually causes less local damage, better bleeding control, reduce risk of injury to adjacent structures such as orbital structures, better wound healing, and cosmetic outcomes as was the choice in this case. However not all foreign bodies in paranasal sinuses are suitable for endoscopic removal. Decision for endoscopic removal depends on accessibility of the foreign body and skill of the surgeon. As in this case, the foreign body was located in the extraconal region and medial to the optic nerve. The decision to not intervene surgically is equally important as removal may result in morbidity and complications such as massive bleeding, neurovascular injury and might even cause death if patient has higher general anaesthesia risk contributed by underlying comorbid. Alternatively, conservative management could lead to infection, chronic facial pain and chronic sinusitis by causing foreign body-granuloma.[4]

If the foreign body is too large and the endoscopic approach is hard to access the foreign body, the external approach can be taken such as external ethmoidectomy. There was a case reported of foreign body with the size of 4cm removed via external ethmoidectomy. It will be difficult as well to be removed endoscopically if the foreign body is located near the optic nerve, carotid artery, cribriform plate, and orbit.[3] Management of gunshot injuries to the face can be divided into acute and late phase.[5] In the acute phase, the goal is to secure the airway and stabilise the patient. Once the patient is stabilised, the focus should be primary wound healing and optimisation of patient's function to reduce disability which are both part of the late phase management. In this case, the patient had visual impairment with limited range of eye motion. Surgical removal should be undertaken even if there is no guarantee for improvement of visual acuity. Possible long term complication can be avoided, such as, foreign body granuloma with local infection, epiphora and foreign body sensation. Computerized tomography scan remains the gold standard investigation for gunshot bullet injuries to the face.[1,6,7] This is because CT scans can show the size, exact location of the foreign body and the nearby structures. It is usually done in the smallest cut of one millimetre and consists of axial, sagittal and coronial view. This aids in determining the surgical approach to reduce mortality and morbidity of the patient.

CONCLUSION

Endoscopic removal of bullet in the orbital apex causes less local damage, less bleeding risk, better wound healing, and cosmetic outcomes.

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