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CASE REPORT

PENETRATING NECK INJURY CAUSED BY A GUN SCREW: A CASE REPORT

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ABSTRACT

Introduction: Penetrating neck injuries caused by firearms are relatively common, but injuries caused by objects other than bullets are rare. However, they are life-threatening and are surgical emergencies. In this case report, we present a case of a penetrating neck injury caused by a gun screw.

Case Report: A 46-year-old male presented to the emergency department with a penetrating neck injury from a gun screw. On physical examination, a 3x3 cm punctured wound was found on the right side of his neck, with no exit wound. Computed Tomography (CT) scan, and CT angiography revealed a curve-shaped metallic object lodged in the right side of his neck, with no evidence of vascular injury.

The patient underwent an emergency surgical exploration under general anesthesia, and a 4.5 cm long, 0.5 cm wide gun screw was found in the right neck's soft tissue. The screw was carefully removed without complications, and the wound was irrigated and closed. After two days of hospitalization, the patient was discharged and had an uneventful recovery.

Conclusion: Penetrating neck injuries caused by gun screws and other foreign objects can be challenging to manage and require prompt surgical intervention. Prompt identification and removal of the foreign object prevent complications and lead to successful outcomes.

KEY WORDS: Penetrating neck injury; neck; penetrating trauma; foreign body; neck; gun; bullet.

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INTRODUCTION

A penetrating neck injury caused by a gun screw is a serious surgical emergency that can result in severe complications and even death.[1] It occurs when a high-velocity projectile gun screw enters the neck area and damages vital structures like blood vessels, nerves, and organs.[1]

The neck is a complex area of the body that contains numerous vital structures, including the trachea, esophagus, major blood vessels, nerves, and the spinal cord. Any injury to these structures can have significant consequences, including airway obstruction, bleeding, nerve damage, spinal cord injury, and even death.[2-4] The morbidity and mortality of penetrating neck injuries are 5% - 10% and 3% to 6%, respectively, mostly from massive hemorrhage.[3-5] The incidence of penetrating neck injuries is highest in young males, and it is mostly from gunshot wounds.[4] A study analyzing 192 penetrating neck injury cases from 2000 to 2010 found that 96.4% of cases occurred in men.[6] A retrospective review of penetrating neck injury cases between 2012 and 2018 found that 88.6% of victims were male.[7]

A penetrating neck injury caused by a gun screw can occur in various circumstances. For example, it may occur accidentally while handling a firearm, during a shooting incident, during surgery or medical procedures involving the neck area, and as the result of assault or self-inflicted injury.[8,9] The severity of a gun screw-associated penetrating neck injury depends on various factors, including the injury's location and depth, the projectile's size and velocity, and the presence of associated injuries. For example, the injury involving the carotid artery or jugular vein can result

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in severe bleeding and rapid deterioration of the patient's condition. The trachea or larynx injury can result in airway obstruction and respiratory distress. In addition, injuries to the cervical spine can result in paralysis or neurological deficits.[10]

Penetrating neck injuries require prompt diagnosis and management and a multidisciplinary approach involving injury surgeons, vascular surgeons, neurosurgeons, and otolaryngologists. This case report presents a penetrating neck injury caused by a gun screw that was successfully managed.

Case Presentation

A 46-year-old male Bangladeshi patient presented to the Emergency Department (ED) with a history of occupational injury over the right lower jaw with a punctured wound that occurred 3 hours prior. The injury happened when he was working in a blacksmith shop, applying a gun nail to a wall, and it bounced back to him.

The physical examination showed that the patient was stable and fully oriented with normal vital signs. There was no shortness of breath, no active bleeding, and no respiratory distress. The patient could swallow both liquids and solids. On examination the wound size was 3×3cm and was located over the right mandible anterior to the masseter with a palpable foreign body below the right angle (Figure 1) and without an exit wound.

Figure 1: Wound found at the right mandible anterior to the masseter

The Computed Tomography (CT) Angiography was requested and showed a curve-shaped metallic foreign below the right mandibular bone angle penetrating the right neck soft tissues, sparing vital structures (Figure 1).

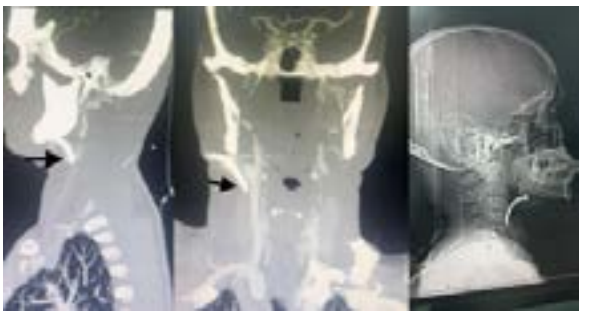

Figure 1: A short foreign body, curve-shaped metallic foreign body inserted into the right anterior neck, headed diagonally toward right carotid vessels but without access to the vessels or outside the neck

The patient was scheduled for emergency surgical exploration under general anesthesia. During surgical exploration, a metallic object was identified within the neck's soft tissues. The object was found to be a gun screw measuring approximately 4.5 cm in length and 0.5 cm. The screw had spared the right carotid artery vessels, trachea, and spine, and no damage to them (Figure 2). The screw was removed, and debridement was done. The patient's wound was sutured, and a drain was inserted. He was admitted to the recovery room for close monitoring.

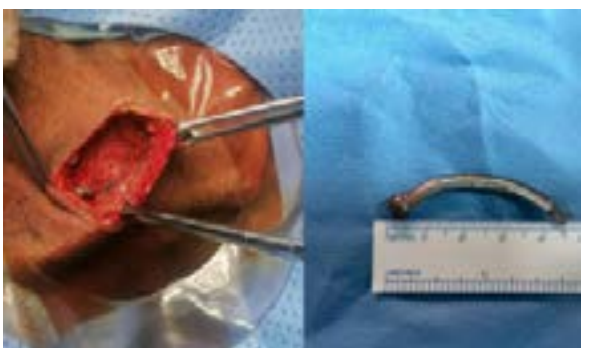

Figure 2: surgical exploration and a 4.5 cm metallic object was identified within the neck's soft tissues.

Post-operatively, the patient was given cefazolin 1000 mg IV 8 hourly, paracetamol 1000 mg IV 6 hourly, enoxaparin 40 mg subcutaneously once a day, omeprazole 40 mg once a day, and dexamethasone 8 mg IV 8 hourly. Daily dressing by the ENT doctor and the drain kept on negative pressure were recommended as required.

Two days post-operatively, the assessment showed an improvement with a clean healing wound, and the treatments were changed to oral Augmentin 625 mg 3 times daily for 7 days and Paracetamol 1000 mg 4 times daily for 7 days. The drain was removed, and the patient was discharged with an appointment for

suture removal after 7 days. After 9 days post-operatively, the wound was healing and clean, with no hematoma. After suture removal, the patient was advised to report back in case of any issue.

DISCUSSION

A penetrating neck injury caused by a gun screw is a rare surgical emergency and can be life-threatening. It is caused by a gun screw from a firearm penetrating the neck. Depending on the location and degree of the damage, the clinical presentation may differ. Bleeding, breathing and swallowing difficulty, pain, and swelling are all frequent symptoms. If the injury involves the major blood vessels, the patient may present with shock or loss of consciousness from hemorrhage.[11,12] The severity of a penetrating neck injury from a gun screw depends on several factors, including the caliber and velocity, the distance from which the gun was fired, and the angle of entry. Injuries caused by high-velocity bullets fired from close range and at a perpendicular angle are more severe than those caused by low-velocity bullets fired from a distance or at an oblique angle.[13,14]

The first priority in management is to control bleeding and ensure the airway is open.[9-11] This may involve applying direct pressure to the wound, elevating the head, or performing an emergency tracheostomy to establish an alternate airway. The ABCDE approach (Airway, Breathing, Circulation, Disability, and Exposure) is used to assess and manage the patient's condition.[9] Furthermore, the patient's neurological condition should be assessed, and any accompanying injuries should be recognized and handled.[15] Once the immediate life-threatening issues have been addressed, the focus shifts to evaluating and treating any underlying injuries.[11]

Diagnostic tests such as CT scans, X-rays, and ultrasound may be used to assess the injury and identify any associated injuries. A CT scan of the neck is often the initial imaging to locate and identify the extent of the injury to major blood vessels.[4] If there is any suspicion of a vascular injury, an angiogram may be necessary to confirm the diagnosis.[16] Our patient underwent CT angiography that showed no vascular injury. The development of multi-detector computed tomography (MDCT) technology has enabled the use of CT angiography as a dependable, sensitive, fast, and non-invasive radiological imaging modality in the assessment of penetrating neck injuries,[17] enabling the evaluation of radiologically non-vascular neck tissues including the cervical spine and upper aerodigestive tract and avoid unnecessary surgical neck explorations.[16]

These injuries can have several complications, including infection, vocal cord paralysis, tracheal stenosis, and nerve damage. Injuries to the nerves in the neck can also be problematic, as they can cause significant pain, weakness, or paralysis.[9] Nerve injury management options include observation, physical therapy, and surgery to restore function as much as possible and prevent long-term disability.[18]

Recovery can be a long and complex process that requires multidisciplinary care. Physical treatment, occupational therapy, and speech therapy may be required to assist the patient in regaining function and mobility.[19] In addition, psychological support may be necessary to address the emotional and psychological impact of the injury.

CONCLUSION

We presented a rare, life-threatening case requiring prompt diagnosis and management to prevent complications and improve outcomes. When a patient presents with a penetrating neck injury, a thorough physical exam and appropriate imaging studies are necessary to determine the extent of the injury and orient treatment options that may include surgical exploration and repair or conservative management with close observation and prophylactic antibiotics. However, with a multidisciplinary approach to providing optimal patient care and early intervention, these injuries can often be successfully managed with good outcomes.

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CONFLICT OF INTEREST
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The following authors have made substantial contributions to the manuscript as under:

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Acquisition, Analysis or Interpretation of Data:	SKK, AMAQ, SAA, SSAD, AQAM, AAH
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All the authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.