

Penetrating neck injury by an arrow: A paradigm of age old assault

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ABSTRACT

Penetrating neck injuries by traditional weapons are rare entity in the modern era of sophisticated weapons. We report an unusual case of penetrating neck injury by a metallic arrow entering anterior neck in zone II and its tip coming out of neck posteriorly causing difficulty for patient to lie down as well as posing challenge to intubate. Arrows are low velocity projectile and from a close proximity they can cause penetrating trauma similar to a low powered handgun. Management of the case was discussed.

Key words: Neck, penetrating injury, projectile.

INTRODUCTION

As the incidence of violence is on rise in our society, the rate of penetrating neck injury is also growing. Commonly penetrating neck wounds result from guns and knives, with the remainder resulting from motor vehicle accidents, household injuries, industrial accidents, and sporting events. Incidence of the penetrating neck injury is estimated at about 5-10 percent of all trauma cases worldwide.¹ The structures at risk in penetrating neck injury are primarily the airway, vascular structures, oesophagus, thyroid/ parathyroid glands, thoracic duct, and neural structures including the spinal cord, the lower cranial nerves and the brachial plexus.

Knowledge of the physical properties and ballistics of the penetrating object can help to determine the management plan and predict the risk of injury. This knowledge can be used also to predict the risks with different treatment options. Arrows and handgun injuries traditionally cause less damaging effect than other

projectiles of higher velocity.^{2,3} Current mortality rate due to penetrating neck injury is 3-6 percent.⁴

Anatomically, the neck can be divided into 3 major zones. Zone I is below the cricoid, Zone III lies above the angle of mandible and represents a dangerous area as major neurovascular structures lie there. Both these zones are well protected by clavicle/ thoracic cage below and mandible above respectively. Zone II which lies between angle of mandible and cricoid and involves 60-75 percent of penetrating injuries.⁵

CASE REPORT

A 32 years old male presented to emergency department six hours after assault with a metal arrow in his neck over a political dispute in a village of eastern Nepal. There was severe pain aggravated by neck movement and the patient was unable to lie down both in supine and prone position. On examination, the patient was in recumbent position on bed supported by attendants. He



Fig. 1. Showing the arrow entering neck



Fig. 2. Showing the arrow coming out of neck posteriorly



Fig. 3. Lateral radiograph of neck showing arrow in neck



Fig. 4. Arrow showing postoperatively

was conscious, oriented and pale, with a regular pulse rate of 100/min and his blood pressure 90/60mm Hg. There was an arrow that had pierced anterior mid neck on the left side with its tip coming out through the back of lower third neck on the same side. This resulted in patient being unable to lie down either in supine or prone position (Fig.1, 2). Blood was oozing on minimal movement at the entry site and there was generalized mild swelling on whole of the left lower half of neck. The patient suffered from slight respiratory difficulty but there was no associated hemoptysis, dysphasia, or hoarseness. No surgical emphysema was noted around the neck. There was no neurological deficit.

X ray soft tissue neck showed a metallic arrow piercing the neck with its tip passing just lateral to C7 vertebra but the airway was intact (Fig-3). Chest radiograph was normal. Colour doppler USG showed intact major vessels, airway and oesophagus, with the metallic rod passing over the left thyroid lobe and a hematoma around the arrow. Flexible nasolaryngoscopy was normal.

Routine investigations revealed haemoglobin- 11.1gm%, and total leukocyte count-13400/ mm³. Urea, creatinine, and random blood sugar were normal.

After a quick evaluation and investigations, the patient was taken to Emergency operation theatre. He was intubated in right lateral position as the arrow was protruding out through the left side of neck posteriorly. The neck was explored by giving entry to exit lazy 'S' shaped incision. About 20 cm long metallic arrow was found entering from left side of the neck anterior to sternocleidomastoid and traversing deep to strap muscles, lacerating the superficial surface of left thyroid lobe, and breaching the carotid sheath. The tip came out by piercing the capitis and trapezius muscles in the lower neck. Great vessels and the laryngeal framework were intact. The arrow was then removed (Fig-4) by dissecting all the overlying structures. Hemostasis was achieved

and the wound was primarily closed in four layers keeping a negative drain. Patient was put on I.V antibiotics and was discharged on the seventh postoperative day after stitch removal. There was no neurological deficit either due to injury or its removal. Follow-up for the last six months was normal.

DISCUSSION

The policy on mandatory versus selective exploration is still unclear even in major trauma centres.² The mode of management ranges from exploring all wounds that violate the platysma to selective exploration based on clinical, radiological and/or endoscopy findings. For stable patients, the choice of management is controversial, though current trend is selective exploration with observation. In routinely explored patients up to 50-60 percent have had negative explorations with some morbidity and cosmetic deformity.^{6,7}

The internal jugular vein (9.0%) and carotid artery (7.0%) are the most common sites of vascular injuries. Injury to the pharynx or the esophagus occurs in 5-15 percent cases. The larynx or the trachea is injured in 4-12 percent cases. Major nerve injury occurs in 3-8 percent patients sustaining penetrating neck trauma. Spinal cord injury is infrequent and almost always results from direct injury rather than secondary osseous instability.⁸ CT angiography can be useful in assessing patients with vascular injuries, however it has limited role at times due to artifacts from metallic fragments and sometimes by abundant soft-tissue air or streak artifacts in the shoulder.⁹

Clinical indications for mandatory emergency exploration include active bleeding, pulse deficit, increasing subcutaneous emphysema, hematemeses, hemoptysis, stridor and hoarseness. The surgeons should formulate their treatment protocol according to their experience and the facilities available.^{10,11}

The Arrow is an addition to the various projectiles reported in penetrating neck trauma. Due to unusual nature of the penetrating object (a metallic arrow), its impacted site and position in neck in the present case, we decided to explore the neck on emergency basis even though the patient was relatively stable.

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