



A case report of penetrating neck trauma and its management

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ABSTRACT

Penetrating neck injury constitutes 5–10 % of all cases seen in the emergency room. As surgeons we must be prepared to manage these cases. After stabilizing the general condition of the patient the neck injuries are assessed. Management has changed from routine exploration to selective exploration. Injury to aerodigestive tract and vessels are commonly seen.

KEYWORDS : Penetrating neck injury . Laryngotracheal injury . Pharyngeal injury.

Introduction

Neck wounds that extend deep to the platysma are considered penetrating injuries. Penetrating neck injuries represent approximately 5–10 % of all trauma cases that present to the emergency department and result in significant mortality [1, 2]. Management requires a logical approach with swift assessment of the adequacy of airway and circulation and of the possible presence of any skeletal or neurological damage prior to operative intervention. A case report of two cases with suicidal & homicidal cut throat injury is described here where the husband after slit opening his wife's throat with a knife, slit opened his own throat following an altercation with his wife.

CASE REPORT

CASE 1: A 39 yr old male patient presented to the emergency department of Dr.B.R AMCH with self inflicted cut throat injury. On examination , a horizontal cut lacerated wound about 8x3 cms , present about 2 cms above the suprasternal notch was noted (fig 1). Anterior wall of trachea was cut exposing the tracheal lumen. Patient showed signs of respiratory distress. A cuffed tracheostomy tube no. 7.5 was inserted through the lacerated trachea as an emergency procedure to restore the airway and prevent any further aspiration (fig 2).

Patient was rushed to OT, GA administered through the tracheostomy tube secured in the casualty. Wound was explored. Bleeding vessels were identified and ligated. Posterior wall of trachea was intact . Wound was closed in layers and patient shifted to ICU for postoperative care. Post operatively patient's condition was stabilized, maintaining 100% saturation on room air.



Fig 1: neck laceration



Fig 2: after tracheostomy

CASE 2 : A 30 yr old female was brought to the emergency with H/O homicidal cut throat injury and multiple cut lacerated wound over both the hands. On examination, patient's pulse was not palpable and BP was not recordable . Patient was in a state of shock. Three cut lacerated wound were present in the neck.

1st wound was 5x3 cms , 2nd was 7x3 cms & 3rd wound was largest extending from one SCM to other measuring 10x3 cms. Patient also had multiple cut lacerated wound over the hands.

Immediately IV line was secured using two wide bore cannula and fluids were rushed. Blood was sent for cross matching and adequate blood was arranged. Cuffed tracheostomy tube no. 7.5 was inserted as an emergency procedure to secure airway and prevent any further aspiration through the lacerated trachea. Adrenaline and atropine was given and CPR was started. 3 cycles of CPR was given then patient revived and was rushed to OT immediately. Patient collapsed again, adrenaline and atropine was given . Inotropic support was increased. Central line was secured. Fluids and blood components were rushed in. once her general condition was stabilized, surgery was started. GA was administered through the tracheostomy tube which was inserted prior in casualty. Wound was explored. First two lacerated wound were sutured after ligating the bleeding vessels. Third lacerated wound was explored, bleeding vessels identified and ligated.

Anterior wall of subglottis was exposed and inferior rim of lacerated trachea was flopping inwards into the lumen. Posterior wall of subglottis and trachea was intact. Inferior rim of the lacerated trachea was excised. Wound was closed in layers after achieving strict hemostasis. Lacerated wound over the hands were also sutured after achieving hemostasis. Patient was transfused two pint of packed red blood cells, four pint of FFP, one pint of whole blood & three pints of RDP. Post operatively patient was shifted to ICU with ventilator support which was weaned off gradually . Patient was doing well with oxygen inhalation & maintaining saturation.



Clockwise- fig 1: after tracheostomy wound; fig 2 & 3: hand injury while self defense; fig 4 : neck laceration

Review

As soon as a patient with penetrating neck injury comes to the

emergency room, rapid assessment of the airway, breathing, and circulation is essential. Once the patient is stabilized, a second survey is carried out checking for symptoms and signs of subcutaneous emphysema, hoarseness, stridor, and respiratory distress and external injuries to the neck are made.

The followings are anatomic areas of the neck :

- Zone 1—between the sternal notch and the cricoid cartilage
- Zone 2—between the cricoid cartilage and the mandibular Angle
- Zone 3—between the mandibular angle and the skull base

Zone 1 contains the major vascular structures of the subclavian artery and vein, jugular vein, and common carotid artery, as well as the esophagus, thyroid, and trachea.

Zone 2 contains the common carotid artery, internal and external carotid arteries, jugular vein, larynx, hypopharynx, and cranial nerves X, XI, and XII.

Zone 3 contains the internal and external carotid arteries, jugular vein, lateral pharynx, and cranial nerves VII, IX, X, XI, and XII [2].

Approximately 20–30 % cases have laryngeal, tracheal, or esophageal injury. Injury to carotids and subclavian vessels carries a high incidence of mortality [3].

Airway

The respiratory rate and signs of airway distress, including dyspnea and stridor, require immediate assessment, and if necessary a tracheostomy should be established where possible. Vocal quality should be noted, and the patient should be questioned about changes in voice. The neck and upper chest should be palpated for subcutaneous emphysema, and the larynx and trachea should be palpated for tenderness and crepitus. Whenever laryngotracheal injury is suspected, intubation should be carried out with great care as further damage to the airway may occur and false passages can be created. Controlled tracheostomy under local anesthesia is always preferred. Flexible laryngoscopy, CT imaging, direct laryngoscopy, and tracheoscopy are done [4].

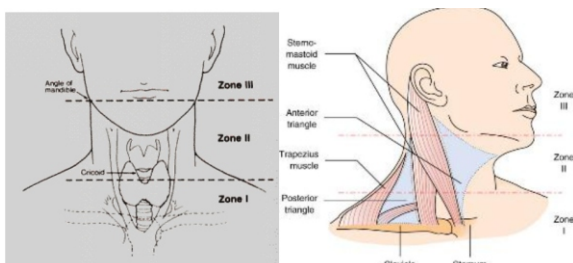
Vessels

An unstable circulation and free bleeding from the wound or marked swelling of the neck may indicate injury to the great vessels. Therefore, all cases of neck injuries should have a check on distal pulse and bruit. Angiography may be done in hemodynamically stable patients prior to exploration where significant damage to vessels is suspected. This can remain hidden in some cases following the traumatic event.

Injury to Esophagus and Pharynx

Bleeding from the mouth, drooling, and subcutaneous emphysema are all signs suggestive of upper digestive tract injury. Contrast-enhanced study may be done if injury is suspected [5].

Indication of immediate surgical intervention in penetrating neck injuries includes hemodynamic instability, exsanguinating hemorrhage, or expanding hematoma. All patients who are stable must have a thorough evaluation of the vascular structures and of the aerodigestive tract prior to any surgical intervention [6].



Zone 1 Consultation with a thoracic surgeon may be required where resection of clavicle and mediastinotomy, or a formal lateral thoracotomy is required.

Zone 2 All veins in the neck may be ligated and the internal jugular vein is best repaired if possible where the vein on the other side is damaged. The external carotid artery may be ligated to stop severe hemorrhage. The common carotid artery and the internal carotid artery if injured must be repaired wherever possible, minimizing any period of arterial clamping and avoiding this where the circulation on the other side is compromised. A lateral arteriorrhaphy or end-to-end anastomosis or grafting is done.

Zone 3 Vascular injuries are difficult to access surgically and may require mandibular subluxation or mandibulotomy for exposure [7].

Laryngotracheal Injuries

Approximately 50 % of patients with an airway injury also have a digestive tract injury. Tracheostomy is done if there is airway compromise. Laryngeal injuries are classified by location (supraglottic, transglottic, cricoid, or tracheal) and type (hematoma, mucosal tears or lacerations, cartilage fractures and/or dislocations, or laryngotracheal disruption).

Minor lacerations, small hematomas, and nondisplaced single fractures may be managed with observation and serial examination [8–11]. Lacerations which need exploration and repair are as follows :

- (a) involving the anterior commissure with exposed cartilage
- (b) multiple or displaced cartilage fractures
- (c) vocal cord immobility or arytenoid dislocation
- (d) injuries sufficient to cause airway compromise

Conclusions

ENT Head & Neck Surgeons may be called on to manage penetrating neck injuries in the emergency room and hence be trained in skills enabling them to the following:

1. Assess and achieve an adequate and stable airway
2. Stabilize a collapsing circulation
3. Assess the head and neck injury swiftly in a logical manner prior to surgical exploration

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