

Case Series

Penetrating neck injuries: experience at a zonal hospital: a case series

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ABSTRACT

Penetrating neck injuries (PNI) are potentially life-threatening due to the high density of vital structures within a small anatomical area. Prompt evaluation and management are crucial for favorable outcomes. Objectives were to describe three cases of PNI with varied mechanisms, clinical presentations, management strategies and outcomes. Three patients presenting with PNI over a 6-month period were reviewed retrospectively. The study conducted at Department of ENT and Head and neck Surgery. All patients with PNI requiring surgical or conservative management are included, Blunt neck trauma is excluded. All patients survived. Early airway control, vascular assessment and appropriate surgical exploration were key determinants of outcome. A structured protocol based on principles of ATLS, hemodynamic stability and anatomical zone involvement ensures optimal management of PNI.

Keywords: Tracheal injury, Stab, Tracheostomy, Multidisciplinary care

INTRODUCTION

Penetrating neck injuries (PNI) account for 5-10% of all traumatic injuries to the neck.¹ Common mechanisms are stab wounds, gunshot injuries or accidents involving sharp objects. Neck has a compact anatomy containing vital structures, vessels, aerodigestive tracts, nerves making such injuries highly morbid and potentially fatal. This series highlights three cases encountered at a zonal hospital, each characterized by unique injury patterns and management strategies, making it an instructive and thought-provoking experience.

CASE SERIES

Case 1

36 years, male have mode of injury was assault by slitting of throat. Primary survey revealed a patent airway, spontaneous breathing, SpO₂ at 99% on room air, with vitals-pulse: 100/ min, BP: 110/78 mm Hg, GCS: E4M6V5. There was a 5 cm lacerated wound in front of

neck. On removal of dressing, few air bubbling through the blood in the wound was seen inconsistently.

What to do next?

Imaging or OT.

As the vitals were stable and no active bleed was there, imaging was carried out.

CECT neck was suggestive of breach in skin and strap muscles with no obvious rent in trachea or any vascular injury. However still a decision to explore was made by the surgical team.

OT

Patient underwent urgent neck exploration and found to sub centimetric rent in trachea (Figure 1) which went undetected in the CT. Primary repair of the rent along with soft tissues was done. Post operatively patient recovered well with normal voice. No air leak or sub-

cutaneous emphysema. Sutures removed on 8th day with a healthy wound.



Figure 1 (A and B): Case 1 presented with 5 cm lacerated wound in front of neck with intra-op findings suggestive of tracheal injury.

Case 2

21 years, male have mode of injury was assault by broken glass bottle over the neck and head region. Patient presented with active bleed from neck with difficulty in speaking.

Primary survey

There was gross air leak from neck wound. Thus, emergency intubation done in ED to safeguard the airway. Rest of the primary survey was WNL.

Secondary survey

Multiple lacerations of various sizes in neck predominantly on left side noted (Figure 2 A).

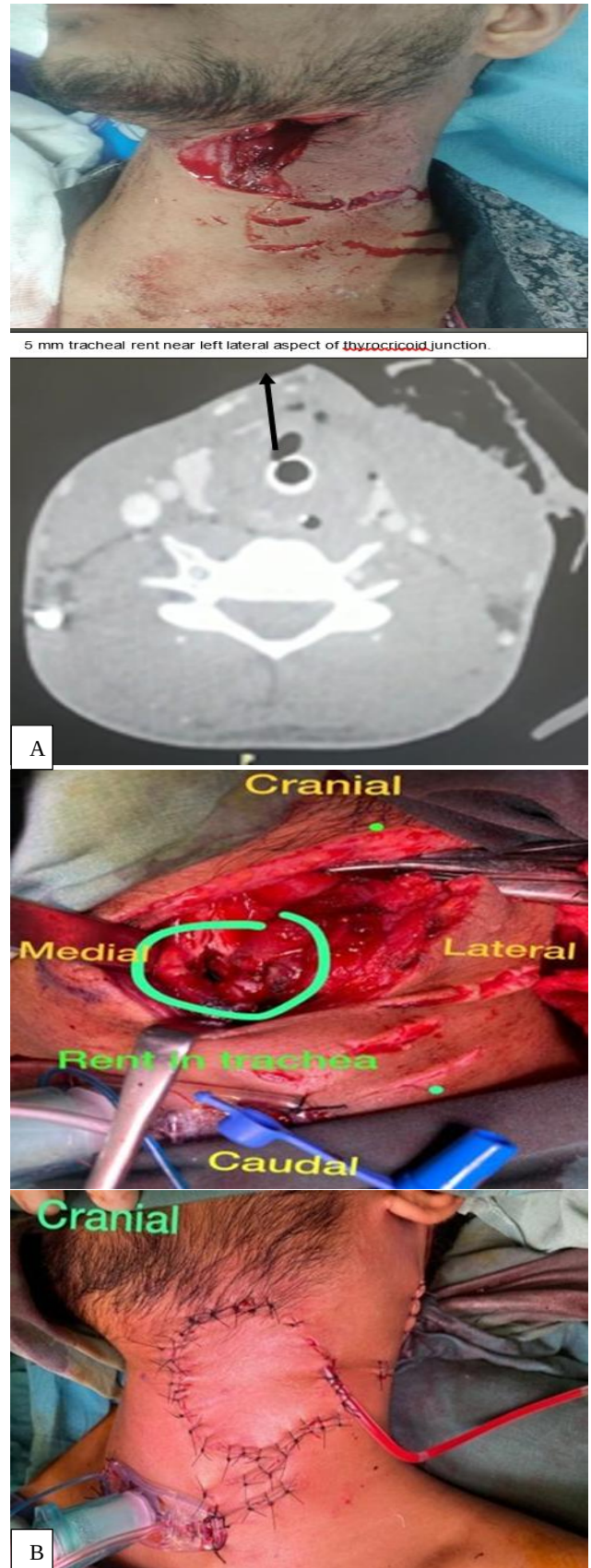


Figure 2 (A and B): A-Case 2 presented with multiple laceration in neck with CT finding suggestive of tracheal injury. B-Case 2 intra-op finding, 1 cm tracheal injury involving the first two rings.

What to do next?

Imaging or OT.

Post intubation he was stable and imaging can be carried out before exploration which could provide the vital information regarding the neck structures during exploration.

CECT (oral + IV) (Figure 2 A) suggested a 5 mm tracheal rent near left lateral aspect of thyrocricoid junction. Paratracheal air noted tracking down till mediastinum. Lacerated strap muscles on the left side. Injuries to vascular structures and oesophageal were ruled out.

OT

Figure 2 B-Tracheal rent involving first two rings approximately 1 cm. Another 1 cm rent in hypopharynx seen at the level of thyroid cartilage noted and repaired with 3/0 PDS. Debridement and repair of soft tissue was done. Ryle's tube inserted. Distal tracheostomy done. Wound closed over a suction drain.

What to do next

Drain removal, decannulation or follow up.

Drain removed after 3 days once its character became clear and the output reduced. As the patient was conscious and alert-IDL for vocal cord was done. Which was noted to be WNL. Thus, decannulation carried out successfully and patient was discharged on day 8.

Case 3

64 years, female have Mode of injury was self-inflicted injury of neck using kitchen knife.

Primary survey

There was air leak noted in the neck wound with active bleeding.

What next?

Protect airway, continue primary and secondary survey, imaging or OT?

Protecting airway is paramount and a life-threatening injury. Both air leakage and uncontrolled bleeding represent formidable dangers, contributing to a situation of grave risk. Thus, the team performed an emergency intubation in ED. There was an approx. 9 cm lacerated wound seen extending from lateral border of left SCM till lateral border of right SCM. Due to active bleeding, patient was immediately taken to OT for emergency neck exploration.

Intraoperative findings (Figure 3)

Active bleed encountered during exploration from external jugular vein and facial artery. Lacerated wounds noted at laryngotracheal junction and another, between first and second tracheal rings.

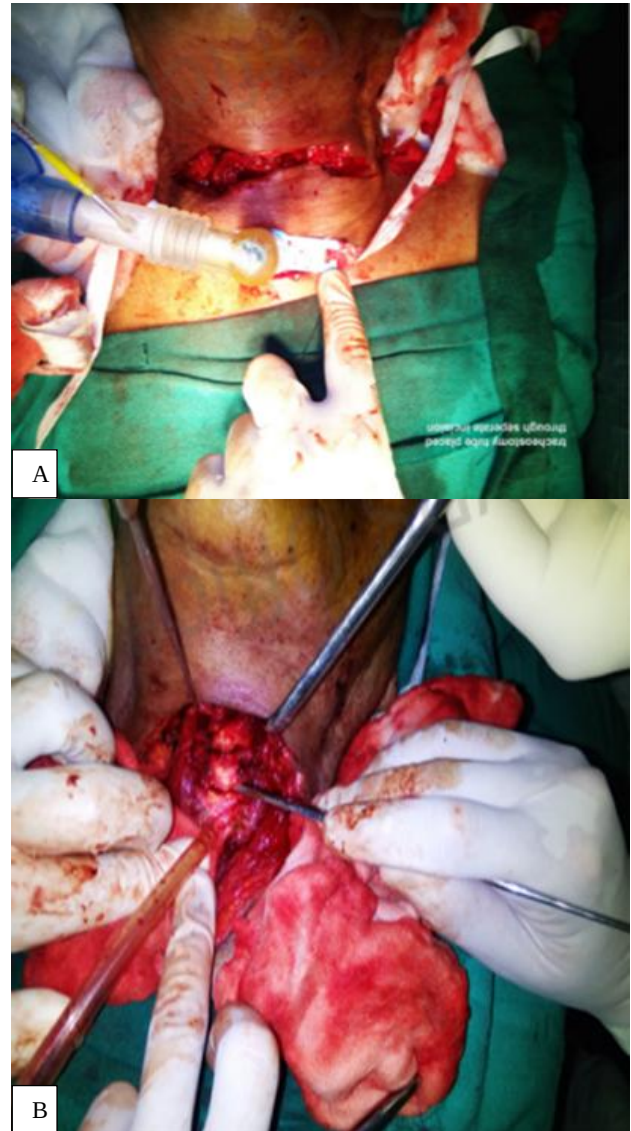


Figure 3 (A and B): Case 3 intra-op findings are lacerated wounds noted at laryngotracheal junction and another, between first and second tracheal rings.

Management

Laryngotracheal wounds repaired as per standard protocol. Tracheal wound re enforced using strap muscles, followed by distal tracheostomy. Lacerated soft tissue debrided and closed in layers. The lady gradually recovered in her consciousness and later from depressive illness, allowing the treating team to decannulate only after 3 weeks. There were no neurovascular deficit or defects in phonation.

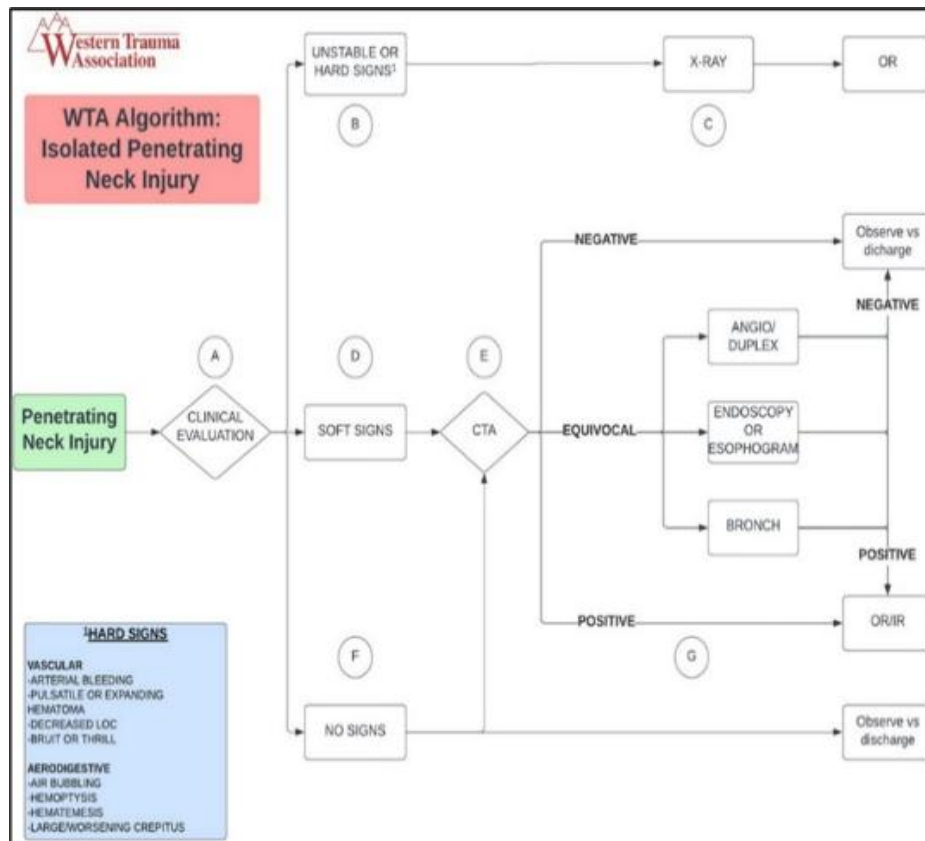


Figure 4: Algorithm to approach neck injuries.⁴

DISCUSSION

PNI are becoming more common because of the increasing prevalence of knife and gun crimes globally. The neck region contains a high density of vital structures in a relatively small and unprotected anatomic region, making it one of the most vulnerable areas for potentially fatal injuries.²

The pre hospital care includes the principles of Medevac and early evacuation to a center which has experts in anesthesia, ENT and trauma surgery.

Neck injuries in any zone may compromise breathing; maintenance of patent airway and at the same time ruling out other injuries like hemothorax and pneumothorax is particularly critical.³ The presence of major vessels renders the region highly susceptible to severe blood loss and shock, with the added danger of blood pooling within the airways and further compromising ventilation.

As discussed in our cases, the factors like airway patency, hemodynamic stability and expertise available the decisions for various surgical intervention were made as per the case scenario.⁴ A prototype algorithm for approach in such case is depicted in Figure 4.

Airway trauma, regardless of severity, invariably demands corrective repair to restore function.

For vascular structures, the oblique sternocleidomastoid incision is preferred; for midline access, collar or transverse incisions above the sternal notch provide clear visualization of the laryngotracheal apparatus.

Small injuries with minimal tissue loss can usually be repaired primarily with absorbable sutures after debridement to healthy margins.⁵ In cases with >50% tissue loss, such as transcervical GSWs, resection of the segment and primarily anastomosis may be required.⁶

In multiple studies it was advocated that endotracheal intubation may lead to disruption of endotracheal pathway.⁷ Tracheostomy stands as a vital emergency procedure in penetrating neck injury-securing the airway while opening the path for surgical exploration. thus, it should be reserved for cases of failed intubation or significant laryngeal injury.

CONCLUSION

The significance of penetrating wounds to neck cannot be under rated. This case series re-emphasizes that systematic approach, based on hemodynamic stability and principles of ATLS can ensure a positive outcome. The findings emphasize that a protocol-driven approach, customized to individual patient requirements, is imperative in current practice. Occurrence of multiple rents in same incidents, missed injuries, meticulous

neurovascular evaluation is a must in such cases. CT angiography is the first-line imaging in stable patients. Early airway protection and multidisciplinary care (ENT, vascular, and trauma teams) are vital for constructive outcomes.

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