

Penetrating foreign body neck: A case report

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Abstract

Penetrating neck wounds are potentially dangerous and require emergency management because of the presence of vital structures in the neck. Organic foreign bodies further carries a risk of wound infection. We present a case of penetrating broken branch of a tree traversing from zone II to zone III without any neurovascular injury. Neck exploration was done with midline mandibulotomy approach and foreign body was removed without any complication.

Key words: Penetrating wound, Zone II, Zone III, Mandibulotomy, Neck exploration

Penetrating Neck Injuries are present in 5-10% of all trauma cases. Many kinds of materials such as knife, bullet, metallic rod, pencil, fragments of glass, wooden stick etc can cause penetrating neck injury. Such injuries can damage vital structures present in the neck like great vessels, nerves, pharynx, oesophagus etc and threaten life¹. We present the case of a patient who had an unusual penetrating neck injury caused by a broken branch of a tree.

Case report

A 11 year old female child was brought to the emergency room with a history of fall from a tree about 8 feet high following which she sustained an injury to the neck with a broken branch of the tree. The child had about six episodes of vomiting and complained of pain. There was no history of excessive bleeding. Examination revealed a through and through penetrating neck injury with a wooden stick entering from the left side of neck just above the level of hyoid bone (zone II) and coming out from the right preauricular region just anterior to the tragus (zone III) (Figure 1). The child was conscious, hemodynamically stable and with no neurological deficit. There was no trismus but child was not cooperative enough to allow proper examination of oropharynx. A CT scan was done immediately and it

showed a penetrating foreign body running obliquely from left submandibular region to right preaural region passing behind the oropharynx and right ramus of the mandible (Fig.3 & 4).

The child was taken to the operation theatre and a tracheostomy was done under sedation and local anaesthesia. General anaesthesia was then given

through the tracheostome. Oropharynx could then be examined and it showed the foreign body passing through it. A midline lip-splitting incision was given till the level of hyoid bone and a midline mandibulotomy was performed. Base of tongue was then incised vertically to gain access into the oropharynx. Exploration was performed on the left side entry wound but no vascular injury was found. After adequate exposure the wooden stick was cut with a wire-cutter and the two parts removed separately. First the part on the left side was removed and then the right half was removed through the oral cavity after confirming that there was no major vessel injury. Mandibular wiring was done and wound was then closed in multiple layers except for the exit wound, which was left open.

Post-operative period was uneventful except for minor wound infection and patient was discharged after complete recovery.

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Fig 1: Stick entering from the left side of neck just above the level of hyoid bone (zone II) and coming out from the right preauricular region just anterior to the tragus (zone III)

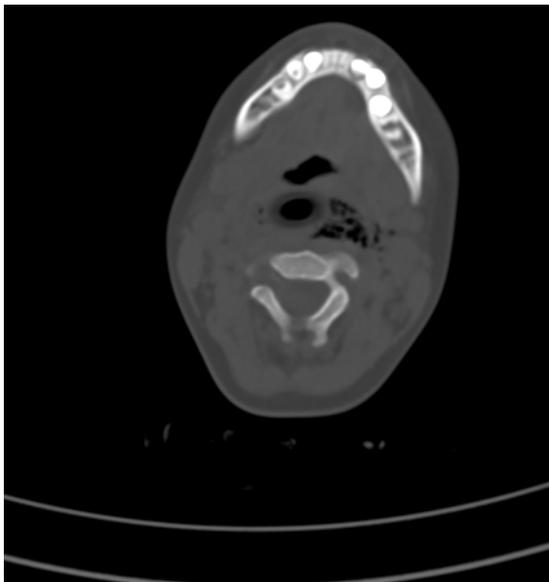


Fig 3 and 4: CT scan was done immediately and it showed a penetrating foreign body running obliquely from left submandibular region to right preaural region passing behind the oropharynx and right ramus of the mandible.

Discussion

All penetrating neck wounds are potentially dangerous and require emergency treatment because of the presence of vital structures in the neck, which can be divided into the following four groups¹; (i) the air passages: trachea, larynx, lungs; (ii) vascular structures: carotid, jugular, subclavian, innominate and aortic arch vessels; (iii) gastrointestinal structures: pharynx and oesophagus and (iv) neurological structures: cranial nerves, peripheral nerves, brachial plexus and spinal cord. Objects penetrating through the neck could damage any of these structures. Moreover, the injury in the zone III (area above the level of angle of mandible) is more dangerous than injury in the zone II (the area between the cricoid cartilage and angle of the mandible) because of proximity of skull base to zone III¹. In the present case, there was injury of the pharynx but fortunately the major vessels and the nerves were not injured. Angiography is done in injuries of zone I (below the level of cricoid cartilage) and zone III for evaluation of the vital vessels and evaluation of relationship between foreign bodies and vessels¹. For zone II injury either exploration or angiography could be done^{1, 2}. A recent study by Nunez et al has emphasized the use of contrast enhanced CT angiography as a noninvasive alternative to conventional angiography³.

Studies have shown that there is no significant difference between clinical examination and angiography for detection of vascular injury in zone II penetrating neck injuries. It is also seen that findings on physical examination are good predictors of arterial injury in patients with penetrating neck wounds and can exclude injury in over 99% of patients⁴. In a recent study done by Saharan et al on 145 patients with zone II penetrating neck trauma, it was found that physical signs of vascular injury like active bleeding, expanding hematoma, bruit, pulse deficit, central neurologic deficit etc could accurately detect vascular injury with missed injury rate of 0.7 % which is comparable to arteriography in accuracy but less costly and noninvasive⁵. The present case had no physical signs of major vessels injury; so extensive investigations were not done apart from the CT scan to get some information on the anatomical relationship of the foreign body with other structure in the neck and face. Moreover, the facility for angiography was not available in the centre.

Sometimes, injury of major vessels might be tamponaded by foreign bodies; therefore blind removal of objects may cause life-threatening hemorrhage. Such foreign bodies should always be

removed by exploration in a proper setup. Exploration of neck is considered mandatory by many surgeons but a selective approach is considered appropriate by others considering the morbidity and mortality associated with surgical exploration^{6,7}. Moreover, exploration of zone III is more difficult than other areas as it is hidden by the ramus of mandible and also carries the risk of injuring the facial nerve. Removal of foreign bodies which break up into fragments such glasses, shotgun pellets etc is more difficult as there are chances of some fragments being left behind but removal of a single piece of foreign body as in this case is much easier. Organic foreign bodies like the piece of branch of tree are grossly contaminated and can cause serious infection if not removed promptly and not treated with adequate antibiotic coverage. Such organic foreign bodies cannot be left in situ. In the present case there was only a minor infection in the exit wound on the right side that responded to antibiotic treatment based on culture and sensitivity report.

Conclusion

Penetrating foreign body in the neck is an uncommon but potentially life threatening entity. In cases of organic foreign bodies, early exploration and removal reduces the chances of wound infection resulting in a favourable outcome.

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