

CLINICAL IMAGE

Penetrating neck injuries: the point of plain films

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Key Clinical Message

Plain films aid management and do not delay the emergency treatment of a stable patient with penetrating neck trauma in the resuscitation room and thus should be taken while arranging CT angiography.

Keywords

ENT, neck injury, otolaryngology, radiology, trauma.

Introduction

A 27-year-old male attended the emergency department having sustained a high velocity penetrating injury to zone-2 of the neck with a nail from a nail gun. Plain film X-ray was deferred in favor of high-resolution CT with angiography (Fig. 1). Artifact from the CT made accurate interpretation difficult. Plain films were subsequently taken and it was clearly demonstrated that the point of a foreign body lay within the spinal column (Figs. 2 and 3).

Questions

- 1 Through what level has this scan been taken?
- 2 Which important vascular structures were the clinicians concerned about?
- 3 What important finding is made clear on plain film imaging?

Answers

- 1 C3-4
- 2 Damage to the carotid arteries
- 3 The foreign body lies within the midline within the spinal column at the C3-4 level.

Discussion and Outcome

Penetrating neck injuries (PNI) are potentially life-threatening emergencies with an incidence of 1–2:100,000 [1, 2]. Patients should be rapidly assessed according to the Advanced Trauma Life Support guidelines before undergoing definitive management [3]. C-spine immobilization is not recommended in penetrating neck trauma except where there is a high index of suspicion of spinal damage [1, 4].

Nason et al. [5] concluded in a retrospective study of 130 cases that observation in asymptomatic patients with

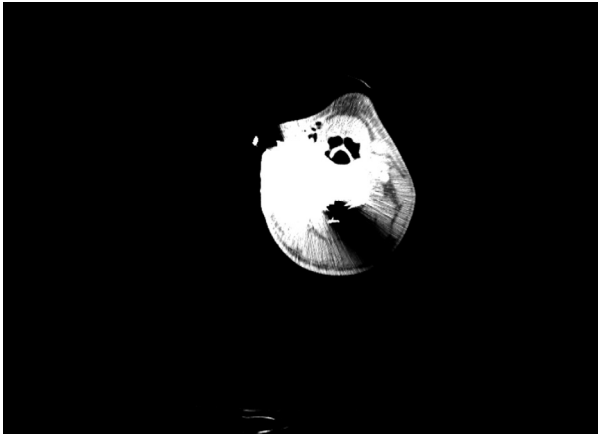


Figure 1. Transverse CT image at C3-4 level showing significant artifact but highly suggestive of foreign body within the spinal column.

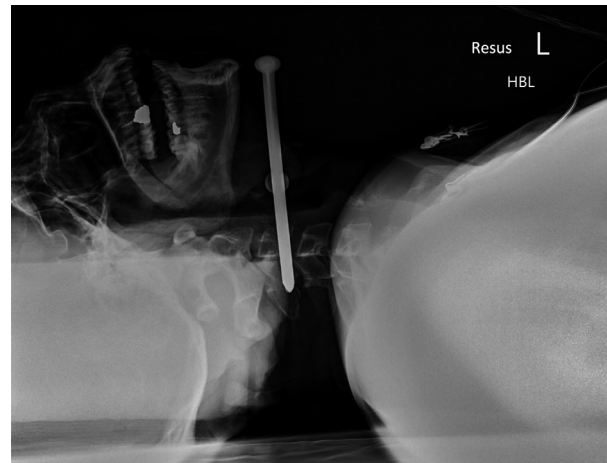


Figure 3. Lateral plain film X-ray confirming position of nail within the spinal column.



Figure 2. AP plain film X-ray showing depth of nail within the neck.

zone 2 neck injuries is adequate in the first instance. Van Waes et al. [6] noted a similar finding in a prospective trial. Current guidelines suggest that in a stable patient clinical examination followed by antero-posterior and lateral plain film radiography of the cervical spine is adequate (Fig. 4) [4, 6]. Injuries to zones 1 or 3, or signs of stroke, hemodynamic instability or expanding hematoma necessitate emergency angiography or immediate surgical exploration.

Conservative management in the form of plain film X-rays would have allowed for earlier diagnosis and immobilization of the C-spine and would have been

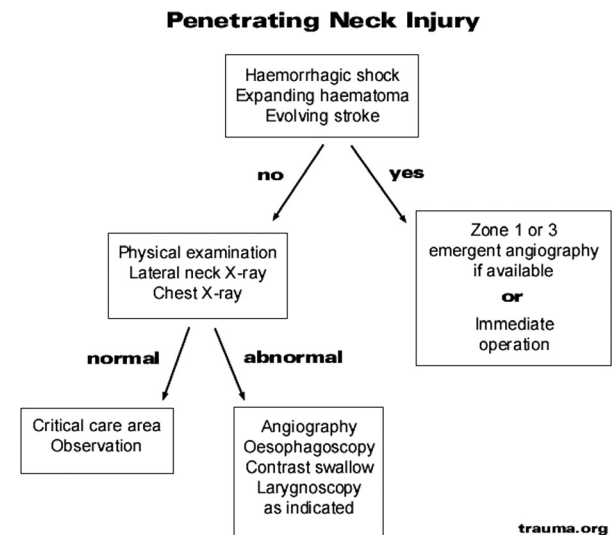


Figure 4. Algorithm outlining the suggested management of patients presenting with a penetrating neck injury.

appropriate in our patient. More aggressive initial management such as in our case can help to give more detailed information at an earlier stage, however, may expose the patient to unnecessary radiation. Given that high-resolution CT with angiography was readily available and that the patient would require such imaging prior to transfer to a tertiary center, plain films were deferred in favor of modern imaging techniques.

Complications of penetrating neck trauma include exsanguination, airway obstruction, perforation of the esophagus, sepsis and stroke secondary to internal carotid transection. Unfortunately in our patient the foreign body transected the internal carotid artery and he developed a

dense left hemiplegia secondary to thrombus formation prior to transfer. He underwent clot retrieval and surgical removal of the nail at a tertiary center without further complication. He was subsequently transferred to the regional brain injury unit where motor function to the left lower limb had improved dramatically but some deficit still remains to the left upper limb.

Take Home Message

The authors conclude that although high-resolution CT scanning may be readily available, plain films should be taken in the resuscitation room in the first instance as to do so may yield important clinical information without delaying definitive imaging techniques.

Acknowledgments

None declared.

Conflict of Interest

None declared.

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