

Zone II Penetrating Neck Injury in a Pediatric Patient

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Abstract

This work describes the ultrasound detection of a zone II penetrating injury of the neck in the emergency setting and its subsequent surgical management.

MeSH Words: Penetrating neck injury, neck zones, pediatric trauma

Case report

A 7-year-old boy presented to the emergency department (ED) with a foreign body which appeared to be a stake impaled in his neck. The boy reported that he had slipped on some rocks while carrying a stick. Bedside ultrasound performed in the ED showed no obvious vascular damage. The patient's condition remained stable throughout the emergency department course. He was referred for surgery for exploration and removal of the object. Findings during surgery revealed that the object had penetrated approximately 6 cm into his neck. There was no significant nerve or vascular injury. The stick was successfully removed, and the patient was released the following day.

Diagnosis: Zone II penetrating injury of the neck



Figure 1. Patient with stick protruding from right neck; zone II injury



Figure 2. Surgically removed stick black mark denotes depth of insertion. Ruler provided for scale.

Discussion

The neck is divided anatomically into three zones, running from inferior to superior. Zone I extends from the clavicle to the inferior cricoid and contains many vascular structures owing to its close proximity to the thorax. Because of the difficulty of surgical exploration in this region, evaluation is typically performed in symptomatic patients with angiography plus esophagoscopy [1]. Zone III extends from the angle of the mandible to the base of the skull; it does not require mandatory exploration for penetrating injuries. However, angiography is required for evaluation of neurological deficits even in stable patients with a zone III injury given the close proximity of the cranial nerves to major vessels in this area. Zone II encompasses the area between zones I and III. Zone II is the most commonly injured area, accounting for 60-75% of all penetrating trauma to the neck. The method of evaluation of zone II injuries is more controversial than for the other zones, with some authors advocating mandatory exploration and others basing the decision on the presence or absence of symptoms [2,3].

The use of ultrasound in the evaluation of trauma injuries has become widespread in recent years. Ultrasound may also be effectively applied in the emergency setting in patients with penetrating neck injuries. In a study of 52 patients admitted to a trauma center with penetrating nerve injuries, Montalvo et al. [4] found that color Doppler sonography correctly identified all serious injuries to the carotid artery and all injuries to the vertebral arteries. In addition, this method is being used intraoperatively by oral/maxillofacial surgeons to identify and remove foreign bodies in the neck

[5]. In the present case, ultrasound showed that the foreign object had apparently not penetrated any major vessels. This finding was later confirmed surgically

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