Bedside emergency department ultrasound in assessment of a gunshot wound

Abstract

This case report presents the bedside use of ultrasound in the emergency department in assessment of a gunshot wound, finding its flexibility and portability to be a premium.

Keywords: gun shot wound, ultrasound.

Brian Burns

MSc, FRCSEd, FACEM

Liverpool Hospital
Liverpool
New South Wales 2170
Australia

Greater Sydney Area
Helicopter Emergency
Medical Service
Ambulance Service
New South Wales Rescue
Helicopter Base
Bankstown Airport
New South Wales 2200
Australia

Correspondence to email
bburns_2000@yahoo.com

Figure 1: Bullet in transverse plane.

Case report

A 23-year-old male was brought in by ambulance to the emergency department of a tertiary trauma centre following a low velocity gunshot wound (GSW) to the left lower limb. He was triaged to the resuscitation area where the trauma team was waiting. Primary survey was unremarkable. Vitals were normal. On secondary survey he had an entry wound with mild bleeding on his left lateral thigh. Abdomen was soft and non-tender. Pelvis x-ray demonstrated an opacification consistent with an unfragmented bullet overlying the left iliac crest, in the midline. On logroll there was an apparent area of swelling in this area felt on palpation.

Bedside EFAST performed using a SonoSite® M-Turbo™ (Sonosite, Australia) was negative for free intra-abdominal fluid. Ultrasound was then performed of the area of swelling using a

13-6MHz, 25 mm broadband linear array probe. This confirmed the presence of the bullet in both transverse (Figure 1) and longitudinal (Figure 2) planes. The point of maximum superficiality was marked, as was the longitudinal direction of the bullet. The patient went to the operating room and had the bullet track cleaned and irrigated. The ultrasound guided localisation markings were used to assist removal of the bullet. He made an uneventful recovery.

Discussion

This is the first reported case of using bedside ED ultrasound to localise and confirm the presence of a suspected bullet in an Australian trauma centre. Metallic foreign bodies appear hyperechoic on ultrasound with acoustic shadow or comet tail artifact (see Figures 1 and 2). Comet tail artifacts are characteristic bands of increased echogenicity

Figure 2: Bullet in longitudinal plane with reverberation artefact.

deep to the object due to reverberation. Ultrasound also allows assessment of surrounding haematoma size. Doppler mode may be used to rapidly assess for related vascular injury but is not the sole radiological tool to investigate for this (e.g. CT angiography). It may also help to assess for intravascular location of a bullet such as occurs in a bullet embolus. Ultrasound evaluation of penetrating extremity trauma also allows assessment of fractures and fragment location.² CT is considered the gold standard radiological modality of choice in investigation of severe trauma. However, in the unstable patient, patient with multi-trauma or

multiple GSWs ultrasound can potentially provide immediate bedside diagnosis and assessment of a range of injuries and guide management.

References

- 1 Bonk RT, Harrison SD, Meissner MH. Intravascular bullet localization by sonography. *AJR* 1996; 167: 152.
- 2 Lyon M, Blaivas M. Evaluation of extremity trauma with sonography. *J Ultrasound Med* 2003; 22: 625–30.