CASE REPORT

Non-lethal? Penetrating chest injury due to beanbag bullet

Sanjay Thakur,¹ Patrick Ely Teloken,² Ian Gilfillan,¹ Sanjay Sharma¹

¹Department of Cardiothoracic Surgery, Fremantle Hospital, Fremantle, Western Australia, Australia

²Department of Surgery, Fremantle Hospital, Fremantle, Western Australia, Australia

Correspondence to

Dr Sanjay Thakur,
docsanjaythakur@hotmail.com

SUMMARY

We report a case of serious lung injury from beanbag bullet. A 46-year-old gentleman, shot with beanbag bullets was brought to the emergency department. Upon arrival he was in obvious respiratory distress and complained of severe pain in the right chest. A 3.0×3.5 cm entry wound on the right parasternal area was identified. Chest x-ray revealed a right haemopneumothorax, parenchymal changes at the right lung base and a radiopaque foreign body. A right-sided intercostal chest tube was inserted, draining air and 750 ml of blood. After stabilisation patient underwent a right thoracotomy. A beanbag bullet was found in the oblique fissure of the right lung, with extensive haematoma of the middle lobe. The bullet and skin fragments overlying the lung and along the bullet track were extracted. The pleural cavity was washed with normal saline and haemostasis was confirmed. The patient had an uneventful postoperative recovery.

BACKGROUND

Various 'non-lethal' weapons have been developed to help police and law enforcement agencies to diffuse civil unrest situation while minimising injury.¹ This technology includes a number of impact munitions such as 'plastic bullets', 'rubber bullets' and 'beanbag rounds'. Beanbag bullet, consist of a synthetic bag filled with 40 g of lead pellets, fired from a 12-gauge shotgun. These bullets are designed to inflict superficial painful injuries, however, avoiding serious injuries that can arise with conventional firearms. First introduced in 1960s, this type of ammunition was banned for almost two decades after a 14-year-old boy died in New Mexico after being shot on the chest.² Since then, beanbag rounds have regained popularity, although with different designs and deployment systems. Currently, the projectiles achieve speeds of around 90 m/s and the recommended minimum distance varies between 3 and 10 m.³

The purpose of this case study is to describe the potential of 'non-lethal' weapons, specifically beanbag bullets, to cause serious penetrating injuries.

CASE PRESENTATION

A 46-year-old gentleman was brought to the emergency department after an altercation with the police. Police reported that the patient was armed with a knife and displayed threatening behaviour. Owing to escalation of the situation despite attempts at verbal negotiations he was shot on the left arm and chest with beanbag rounds. The

distance from which the rounds were fired could not be established. The patient was immediately taken to the emergency department. Later it was uncovered that he suffered from paranoid schizophrenia.

Upon arrival in the emergency department the patient was in obvious distress, complaining of severe pain in the right chest. He was tachypnoeic with a peripheral oxygen saturation of 91% on 15 l/min oxygen via non-rebreather mask, heart rate was 100/min and blood pressure was 140/90 mm Hg. An entry wound on the right parasternal area, measuring approximately 3.0 × 3.5 cm was observed (figure 1) and superficial lacerations on the left arm were identified. A chest x-ray revealed a right haemopneumothorax, parenchymal changes at the right lung base and a radiopaque foreign body (figure 2). A right-sided intercostal chest tube was inserted, draining air and 750 ml of blood. CT scan of the chest and upper abdomen demonstrated lung contusions and a hyperdense foreign body within the right hemithorax (figure 3). No mediastinal or intra-abdominal injuries were seen.

After initial stabilisation patient underwent a right thoracotomy, and a beanbag bullet was found in the horizontal fissure of the right lung, with extensive surrounding haematoma of the middle lobe. The bullet and skin fragments overlying the lung and along the bullet track were extracted (figure 4). The pleural cavity was washed with normal saline and haemostasis was confirmed. Two chest drains were inserted (apical and basal) in the right pleural cavity. The entry wound on the right chest and laceration on the left arm were cleaned and debrided.

Figure 1 Entry wound on the right anterior chest wall.

To cite: Thakur S, Teloken PE, Gilfillan I, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2012-008482

Figure 2 Chest x-ray showing right haemopneumothorax, parenchymal changes at the right lung base and a radiopaque foreign body.

OUTCOME AND FOLLOW-UP

The patient had an uneventful postoperative recovery, and was discharged to the care of the psychiatric team after 5 days.

DISCUSSION

Numerous injuries owing to beanbag bullets have been reported in the literature^{4–5} including penetrating injuries to the chest,^{6–7} abdomen⁸ and limbs.⁹ A total of four cases of penetrating chest injury have been previously reported, three of these with older generation beanbag designs^{5–6} and only one with a newer ‘drag stabilised’ bullet, similar to the one found in the present case.⁷ Our case confirms that currently used beanbag bullets still carry the potential to cause penetrating chest injuries, in spite of changes in the design.

With regard to outcomes in previous reports, in one case the patient died before reaching the hospital, and autopsy identified the beanbag had penetrated the second intercostal space above the nipple on the right lobe and lacerated the upper and middle lobes.⁵ In the remaining three cases patients were submitted to thoracotomy, open⁶ or video- assisted.⁷

Figure 3 CT scan of the chest (obtained after insertion of the right intercostal chest tube) showing lung contusions and a hyperdense foreign body within the right hemithorax.

Figure 4 Beanbag bullet with overlying skin fragments after removal from the right oblique fissure.

In contrast to traditional lead projectiles, beanbag bullets require extraction, for several reasons.^{6–10} Being a low-velocity projectile, it cannot be considered sterile, increasing the risk of infection. Also, the synthetic fabric can cause a local inflammatory reaction similar to a gossypiboma. Lastly, the physical characteristics of the beanbag make it more likely to drag skin and clothing fragments into the wound, as seen in our case. The intraoperative findings ultimately define the extent of surgery needed. In our case, foreign body extraction and washout were sufficient. Conversely, in previous reports lung resection or pulmonary tractotomy was required.⁶

Learning points

- ▶ Contemporary beanbag bullets still have the potential to cause life-threatening injuries.
- ▶ Basic principles of management apply regardless of cause in penetrating chest.
- ▶ Beanbag bullets require extraction.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Lewer N. Non-lethal weapons: operational and policy developments. *Lancet* 2003;362(Suppl):s20–1.
- 2 Ijames S. In defense of the 12-gauge “bean bag” round. *PoliceOne.com*. www.policeone.com/columnists/steve-ijames/articles/118328/ (accessed 12 Mar 2013).
- 3 MK Ballistic Systems [Internet]. [cited 2012 Aug 12]. <http://www.mkballistics.com> (accessed 12 Mar 2013).

- 4 Suyama J, Panagos PD, Sztajnkrycer MD, *et al.* Injury patterns related to use of less-lethal weapons during a period of civil unrest. *J Emerg Med* 2003; 25:219–27.
- 5 De Brito D, Challoner KR, Sehgal A, *et al.* The injury pattern of a new law enforcement weapon: the police bean bag. *Ann Emerg Med* 2001; 38:383–90.
- 6 Charles A, Asensio J, Forno W, *et al.* Penetrating bean bag injury: intrathoracic complication of a nonlethal weapon. *J Trauma* 2002; 53:997–1000.
- 7 Hill CS, Lu SW, Schwartz J, *et al.* Successful video-assisted thoracoscopic surgery (VATS) management of a penetrating injury to the thoracic cavity from a Drag Stabilized bean bag. *Am Surg* 2010;76:E59–60.
- 8 Olivas T, Jones B, Canulla M. Abdominal wall penetration by a police “bean bag”. *Am Surg* 2001;67:407–9.
- 9 Grange JT, Kozak R, Gonzalez J. Penetrating injury from a less-lethal bean bag gun. *J Trauma* 2002;52:576–8.
- 10 Lichte P, Oberbeck R, Binnebösel M, *et al.* A civilian perspective on ballistic trauma and gunshot injuries. *Scand J Trauma, Resusc Emerg Med* 2010;18:35.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.

BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow