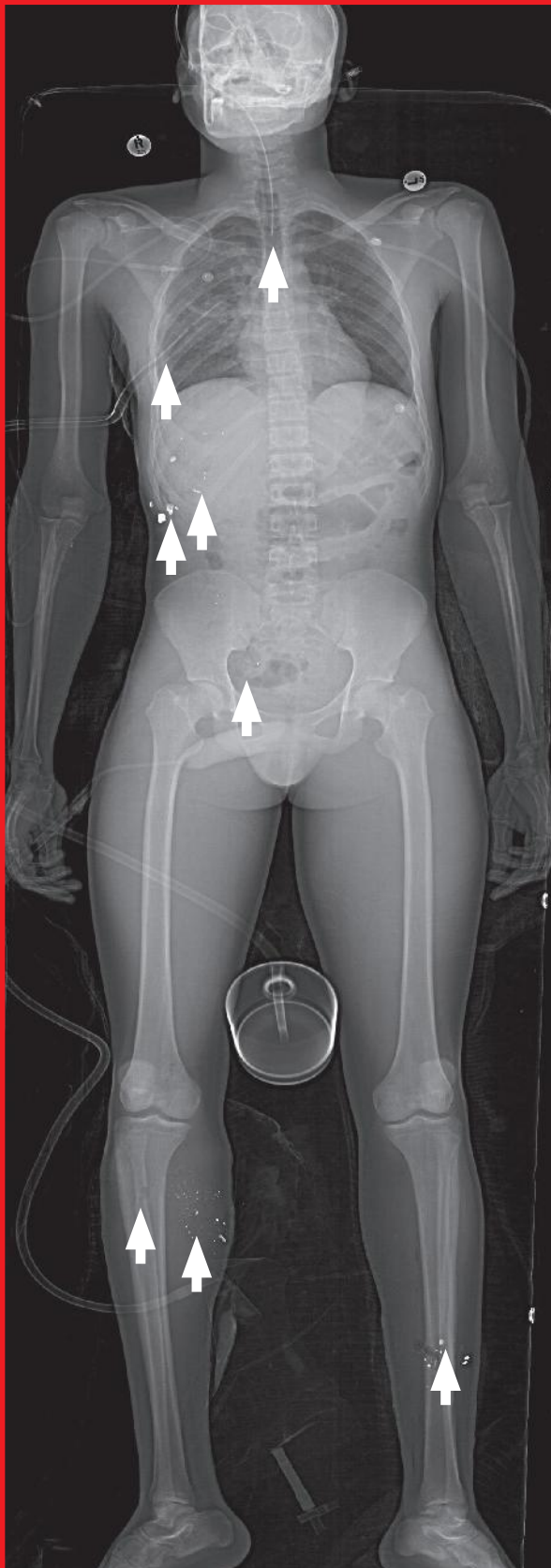


A Case Study of the use of Lodox to locate dispersed bullets in a critical trauma patient.



A case study from the Trauma and Emergency Unit of Groote Schuur Hospital, the largest hospital in the Western Cape Province of South Africa.

Introduction

Violent crime, particularly that involving guns, is a problem for countries around the world. In the United States of America, based on emergency department visits, there were 52,447 deliberate and 23,237 accidental non-fatal gunshot injuries during 2000¹. According to the FBI Crime Report, more than twice as many people were killed by firearms than any other means between 2006 and 2010². This burden is most keenly felt by the trauma emergency departments which receive, and have to treat, these patients with often challenging dispersed bullet wounds.

Case Presentation

This patient was a 28-year old male that had sustained three gunshot wounds (GSW) to the right upper quadrant of the abdomen, right lower limb and left lower limb. There were no exit wounds. He was intubated, a right intercostal drain inserted for clinical haemothorax and a right sided central venous pressure line placed. He was haemodynamically unstable, and on examination he had a distended abdomen. There was macroscopic haematuria. His lactate was 7 mmol/l and he had a base excess of - 12.

Imaging, Diagnosis and Treatment

A Lodox full-body X-ray was performed that confirmed the correct positioning of the endotracheal tube, right CVP line and the right intercostal drain and clearly demonstrated the positions of the bullets and shrapnel, as well as the position, type and severity of the fractures. This was followed by a FAST (Focused Assessment with Sonography in Trauma) of the heart, which showed no cardiac injury but free fluid in the abdomen. While the patient was waiting for theatre, a single shot Intravenous Pyelogram (IVP) was performed with the Lodox that showed a functioning left kidney. This IVP took 5 minutes.

The patient was taken to theatre for a laparotomy and the major liver injury was packed with swabs and a right nephrectomy performed. He stabilised haemodynamically and a back slab was placed on his fractures. He was taken to the ICU where the resuscitation was continued and he returned to theatre 24-hours later for debridement and a washout of his orthopaedic fractures. The liver packs were then removed a further 24-hours later. He remained in ICU for 5 days and was then transferred to the ward where he had an uncomplicated course and was discharged on day 10 post-admission.

Discussion

This case presents an unresponsive, unstable patient with gun shot wounds in disperse areas of the body - left kidney, left lateral abdomen, pelvis, right and left legs. Gaining information on the type, severity and position of this patient's most critical wounds presents a typical trauma challenge, since his instability puts him at risk of crashing during imaging examinations, and the dispersed positioning of his wounds would require multiple views and/or modalities. In this circumstance, the Lodox was successfully used to confirm placement of tubes and lines, ensuring a more stable patient for surgery. It also provided an overview of the patient's injury pattern, including the position of all bullets and shrapnel. The speed with which this information was obtained (13 seconds for the scan) was key to the successful treatment of the critical patient. Furthermore, the application of the Lodox to perform a single-shot IVP in only 5 minutes while still in the trauma unit provided vital information about the patency of the patient's kidneys, which informed his successful surgical treatment. Importantly, the use of the Lodox, together with the FAST, provided sufficient information and allowed examination and treatment of the patient without the use of a CT scan, illustrating how a lower dose methodology can be used with success, especially in cases where the risks of sending a patient for CT might be too great, or the availability of CT restricted.

Conclusion

The Lodox is ideally suited for providing an instant imaging overview of the unresponsive, unstable patient, particularly in the case of multiple GSWs, and where alternative imaging is unavailable or too risky. The accurate imaging of tubes and lines provides a confirmation of correct placement before surgery or further imaging.

"This is a perfect example of the ability of the Lodox to aid in the resuscitation of the severely injured patient"

PROF A. NICOL, HEAD OF TRAUMA, GROOTE SCHUUR HOSPITAL

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