CASE REPORT

Extracranial knife blade detected by magnetic resonance

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Introduction

Multiple penetrating trauma is such a common presentation at emergency departments that it may be tempting to avoid exclusion of foreign bodies from all wounds by clinical or radiologic means, particularly if the weapon used is a knife. This paper presents the case of a young male victim of multiple stabbing who proceeded to magnetic resonance (MR) scanning with an undetected, ferromagnetic knife blade lodged under his scalp.

Case report

A previously well 36-year-old male was brought to the emergency department after being attacked in a public square. He sustained multiple stab wounds to the head, neck, chest and limbs, and was unable to flee owing to loss of motor power in his left leg. Blood loss at the scene was estimated to be at least a litre. A thorough police search failed to locate the attack weapon reported by onlookers to be a pocket-knife.

On arrival at the emergency department the patient had a heart rate of 72/min, respiratory rate of 20/min and systolic blood pressure of 130 mmHg. Examination revealed multiple stab wounds of less than 1 cm length to the left temporal region, posterior neck, left arm and shoulder, left back and left leg and knee. He had no active dorsiflexion of the left ankle. Trauma X-rays of lateral cervical spine, chest and pelvis showed no abnormalities.

A secondary plain film series of the left shoulder, left leg, left knee, and cervical thoracic and lumbar spine revealed no bony injuries or foreign bodies. The patient was assessed by the orthopaedic team who requested an MR scan of the cervical spine on the basis of a stab injury to the neck and distal neurologic deficit.

The MR was abandoned when it became apparent that a ferromagnetic foreign body was present in the field. A CT scan then revealed the broken blade of a pocket-knife lying under the scalp of the left temporal region with its tip buried in the zygoma (Fig. 1). No spinal, cranial or intracranial injury was identified.

The patient was then transferred to the operating room where the knife blade was removed and his superficial wounds were washed out (Fig. 2). Exploration of his left leg wound revealed irreparable division of the left peroneal nerve and anterior tibial artery. Recovery was uneventful but he was left with a permanent left foot drop.

Discussion

Magnetic resonance imaging is rarely utilised in trauma because of availability, prolonged scan time,
and the loss of ability to closely observe and treat the patient undergoing the scan. The risk of heating or movement of ferromagnetic materials in tissue causing further injury to adjacent neural, vascular, or soft-tissue structures is another consideration in trauma patients who have suffered penetrating injury. If these obstacles are overcome, magnetic resonance is potentially superior to plain films and computerised tomography for imaging of tissue damage and foreign bodies.

As well as anatomic location, the relative risk of injury from movement of heating of the foreign body depends on its ferromagnetic properties, the geometry and dimensions of the object, the strength of the static magnetic field and ability of the retaining tissues to resist heating or movement of the foreign body.

The use of plain film radiography is recommended to detect metallic foreign bodies in patients prior to admission to the MR environment,

Figure 1  CT scout image showing pocket-knife blade impacted into left zygoma.

Figure 2  Pocket-knife blade retrieved at operation.
however if the presence of a foreign body is known and MR imaging would be beneficial, a pre-scan test of a fragment of the same material as the foreign body, if available, can determine whether it is safe to proceed.¹

In conclusion, this case serves as a reminder that foreign bodies should be suspected in all penetrating wounds and that patients must be screened for foreign bodies by thorough exploration or plain film radiography prior to MR imaging in trauma.

References