Death from an Anti-Personnel Grenade Explosion

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SUMMARY: A case is described where death occurred, due to the penetration of small high velocity metal fragments, from the explosion of an anti-personnel grenade.

Introduction

A thirty year old Nepalese Corporal was engaged in clearing abandoned military equipment in the aftermath of the recent Falklands Islands conflict, when an explosion occurred. He was lifting a hand launched rocket missile at the time, but although the propellant ignited, the war head did not explode, and it was thought that the device had been "booby trapped." The officer in charge of the clearance operation was approximately 100m away and when he reached the site of the incident the deceased was unconscious but apparently still alive. Evacuation by helicopter took 20 minutes, but he was dead on arrival at hospital. The injuries particularly to the legs, although severe did not appear to be lethal and the cause of death was only established by post mortem examination.

Postmortem findings

The body had been undressed but it is understood the deceased had been wearing boots, combat jacket and trousers, with a woollen pullover and a flannel shirt. The external injuries were mainly on the front and medial aspects of the legs, and comprised numerous perforations 0.5 to 1.0cm diameter, and skin lacerations 2 to 3cm long. Similar but less frequent lesions were present on the front of the trunk and on the inner aspect of the arms. In addition there was partial amputation of the right big toe and extensive skin loss from the medial aspect of the fore-foot with charring of the exposed tissues. Compound fractures of the right tibia and fibula at the junction of the lower third and upper two-thirds were also present. The hair was singed and two superficial abrasions were situated under the chin. The only wounds on the posterior aspect of the body were ragged lacerations on the back of the right thigh and the right forearm. Several of

the perforations on the legs were explored and fragments of metal, approximately 2-3mm diameter, average weight 100mg were eventually recovered from three of them. When the chest and abdomen were opened two perforations of the chest wall were

Fig. 1 Perforations in right ventricle due to grenade fragments

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noted 4cm apart between costal cartilages six and seven on the right and seven and eight on the left. A further perforation passed through the abdominal wall in the right epigastrium. The lungs and pleural cavities were normal but an estimated 500ml of blood was present in the pericardial sac. Two perforations in the right ventricular wall were seen (Figure 1) and in view of the difficulty of locating the metal fragments in the leg wounds, the heart was removed and the presence of two fragments confirmed radiologically before further dissection (Figure 2). When the heart was opened faint wound tracks were seen passing through the interventricular septum and metal fragments, similar to those removed from the legs, were found embedded in the left ventricular wall. The only other wound of significance was a single perforation of the stomach on the greater curvature, although the metal fragment was not found among the bulky food residue which was present. The airway was clear and the cervical spine and cranial contents showed no abnormality.

Fig. 2 Radiograph of the heart after removal from the body

Discussion

The injuries were consistent with an explosion producing metal fragments, occurring close to the right foot while the deceased was in a crouching or stooping position. No significant external leakage of blood occurred, so it is likely that the accumulation of blood in the pericardium and consequent tamponade resulted in rapid death. In the heart the perforations of the septum were low down and interference with conduction bundles is unlikely. The ragged wounds on the back of the right thigh and forearm were probably exit wounds of metal fragments passing through the tissue. The abrasions under the chin were probably caused by the rocket launcher tube which he was lifting when the explosion occurred. All the metal fragments removed from the body were of the same size, weight and shape, i.e. a blunt cone with irregular jagged base. Examination of the explosive devices known to be available suggest that the fragments originated from an American M67 anti-personnel grenade, which has a regular embossed pattern on the interior surface (Figure 3). The case illustrates the remarkable penetration and potential lethality of small light particles of metal when travelling at high velocity.

Fig. 3 Pattern on the interior surface of the M67 grenade

Acknowledgement

I am indebted to Major J W Quin, RE for identifying the grenade and supplying the example used for Figure 3.