CASE REPORTS

Unusual pattern of injury caused by a pyrotechnic hand held signal flare

Department of Plastic and Reconstructive Surgery, Royal Devon and Exeter Hospital (Wonford), Barrack Road, Exeter EX2 5DW

D W Oliver
M Ragbir
P J Saxby

Correspondence to:
Mr P J Saxby, Consultant
Plastic and Reconstructive
Surgeon.

Accepted for publication
4 February 1997

D W Oliver, M Ragbir, P J Saxby

Abstract

The case is reported of a man shot with a distress flare from a range of about 3 m. The flare caused a large cavity deep to the pectoral muscles. There should be a high index of suspicion about the extent of the injury in all types of penetrating trauma.

(*J Accid Emerg Med* 1997;14:258-259)

Keywords: distress flare; penetrating trauma

Individuals concerned for their own safety may carry a wide range of devices to deter and repel would be assailants. These may be commercially available or improvised devices. Some unusual patterns of injury can therefore be expected. We report on one such injury caused by a pyrotechnic hand held signal flare (fig 1).

Case report

A 33 year old male was shot with a distress flare over the lower sternum from a range of approximately three metres in an open area. The patient reported seeing a flash of light from the initial discharge of the flare and then burning red smoke coming from his clothing following impact with his chest, this was sustained for several seconds. There were no burns to his hands or inhalation injury. Examination revealed a 1 cm diameter charred penetrating wound over the manubrium sternum (fig 2), the size of the base plate of the flare which was later recovered from the wound. The patient remained haemodynamically stable without evidence of respiratory distress.

Debridement of the wound was undertaken promptly under general anaesthesia. Operative findings were surprising, considering the external appearance. A large cavity had been formed deep to the pectoral muscles, extending superiorly to the second ribs, inferiorly to the lower border of pectoralis major, and laterally to the anterior axillary lines. The cavity was lined with a whitish powder and contained burned and devitalised tissue requiring extensive debridement (fig 3). Incisions were made around the lower and lateral borders of the cavity and the wound packed deep to remaining muscle with betidine soaked gauze. Antibiotics were given and the wound dressed daily initially and then at regular intervals until healed.

Discussion

The incidence of penetrating trauma caused by ballistic injury is rising in the United Kingdom. The signal kit pyrotechnic pistol fires a mini-flare and is used in both the military and the civilian setting. Civilian use is primarily as a maritime distress signal. The propellant is a conventional .22 pistol cartridge. The flare is screwed into a hand held pen sized device and a spring loaded trigger used as a firing pin. A red burning flare is projected into the air to a height of approximately 80 m. The flare contains magnesium, strontium nitrate respon-

Figure 1 Hand held signal flare.

Figure 2 Entry wound over sternum.

Figure 3 Cavity following debridement.

sible for the red colour, potassium chlorate, graphite varnish, and polyvinyl chloride. Flares can easily be obtained and legally held without a firearms license. This situation is unlikely to be affected by the proposed changes to firearms legislation. Because of its relatively large size and shape compared to an ordinary .22 round, its kinetic energy is rapidly overcome by air resistance. However, at short range it is capable of causing serious penetrating injury.¹

In the second world war and the Korean war, major wounds to the thorax were associ-

ated with a mortality of approximately 40%.² This highlights the need to consider thorough surgical debridement in all gunshot injuries, not just those from rounds with high energy transfer. There may be little indication from the appearance of the entry wound of the cavitation and tissue damage caused, particularly from this type of explosive ordinance. The flare is designed to burn vigorously in flight for six seconds with an intensity of 10 000 candles. Therefore, if the flare strikes the body within a short time of firing, it will continue to burn within the tissues for several seconds before it would otherwise have burnt out and landed harmlessly. We feel that our patient was lucky to escape with only soft tissue injury, although he had a relatively long period of hospital inpatient treatment (three weeks).

This case highlights the need to maintain a high index of suspicion in all types of penetrating trauma when initially assessing the extent of injury. In this case the history and charring around the entry wound gave an indication of the mechanism of injury. The wound was treated by thorough surgical debridement in the standard fashion and resulted in good clinical outcome.

1 Pluisch F, Sellier K. The effect of luminous and signal munitions on the human body. *Arch Kriminol* 1993;191:151-57.

2 Bellamy RF. The causes of death in conventional land warfare. *Military Med* 1984;149:55-62.

Gamma hydroxybutyrate—a coma inducing recreational drug

John M Ryan, Ian Stell

Abstract

The effects of γ hydroxybutyrate, a coma inducing recreational drug, are described and illustrated by case reports of five patients presenting to accident and emergency (A&E). All had depressed levels of consciousness. There was strong circumstantial evidence of γ hydroxybutyrate ingestion in all cases, and laboratory evidence in two. All recovered with supportive treatment. γ Hydroxybutyrate has become a fashionable recreational drug. The majority of people who have ingested it will recover spontaneously without long term sequelae but its toxic effects may be dramatic while they last, particularly when it is taken with other drugs or alcohol.

(*J Accid Emerg Med* 1997;14:259-261)

Keywords: γ hydroxybutyrate; seizure; recreational drug; hypothermia

We report five cases of coma arising from misuse of γ hydroxybutyrate, also known as sodium oxybate. This drug, commonly known

as GHB, Liquid X, or Liquid Ecstasy, is a non-illegal drug which is used recreationally for its ability to produce euphoria. Toxic effects include drowsiness, headache, nausea, respiratory depression, seizures, and coma. These effects may be more pronounced when taken in conjunction with alcohol and other drugs. Patients usually recover after a few hours of supportive care.

γ Hydroxybutyrate was first reported as a drug of abuse in 1990 in North America and has been available in the United Kingdom, mostly in night clubs and among body builders, since at least 1994. This drug and its toxic effects should be known to doctors responsible for patients who present unconscious or with seizures.

Case reports

All the patients presented to A&E having taken γ hydroxybutyrate in combination with various other drugs or alcohol.

CASE 1

A 37 year old woman was brought to hospital after collapsing at home. A witness described a seizure, which was followed by deep uncon-

Department of
Accident and
Emergency Medicine,
Royal Sussex County
Hospital, Brighton
J M Ryan

Department of
Accident and
Emergency Medicine,
Guy's Hospital,
London SE1
I Stell

Correspondence to:
Mr John M Ryan,
Department of Accident and
Emergency Medicine, The
Royal Sussex County
Hospital, Brighton BN2 1HG
email J.M.Ryan@sussex.ac.uk

Accepted for publication
28 February 1997