Air-bag injury

Whilst driving in the USA recently a 53-year-old man sustained lesions of the forearm and facial skin which looked remarkably like dermatitis artefacta.

The injuries were the result of the explosion of an air-bag, which are now built into the steering column of many American cars as a safety feature. He had skidded on an oil patch into a stationary car in front, with an impact velocity of about 10 m.p.h. He was wearing a 3-point lap and shoulder seat-belt. There was minor damage to the front bumper of his car, but no damage to the other car or its occupants. On impact he heard a loud bang, and was momentarily concussed. When he awoke, the car was filled with black smoke, the lower half of his face was stinging and covered with blood, he had three large superficial haematomas in a line along the flexor aspect of the left forearm and there was a painful onycholysis of the right thumb nail. His front-seat passenger was unhurt, though shaken, as she ‘thought his head had exploded’.

The expanding canvas bag had dermabraded the lower half of his face and it had ‘scuffed’ his expansile metal watch-strap from the wrist towards the elbow, damaging the superficial veins. The bleeding stopped quickly, and the areas of erythema and abrasion were then seen to be in ‘artificial’ angular and linear patterns, with areas of skin sparing typical of the morphology of dermatitis artefacta. This unusual appearance was due to sparing of the creases caused by the tangential impact of the bag on the skin.

Air-bags reduce the risk of brain damage and facial lacerations in severe car crashes, and the fatality rate might be reduced by around 6% if all cars had air-bags in addition to seat-belts.1 The incidence of cervical spine injury is also reduced by air-bags, because they decelerate the forward flexion of the neck in those wearing seat belts.2 There is therefore a ‘trade-off’ between their beneficial effects in severe crashes, and the unexpected damage they might cause in minor crashes.3

In addition to abrasions of the face, neck, arms and chest, they can also cause abrasion or contusion of the eyes4–6 and minor burns of the hands and fingers due to escape of hot gases from the rear of the exploded bag in the car.6 Second degree burns of the front of the neck ‘in a striated pattern’ due to air-bag explosion have been reported previously,6 although the present case suggests these may have been mild abrasions rather than thermal burns.

Such injuries will be seen frequently by accident and emergency staff when air bags become standard fittings in British cars. Air-bag injury should be added to the list of conditions which can mimic dermatitis artefacta.

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Waste of a precious resource?

The concept of autotransfusion is over a century old4 but apart from some interest during the First World War, for its use in chest injuries,2 it was largely forgotten with the advent of blood donation and safe cross-matching. Over the last two decades it has again come into vogue, prompted by fears of HIV and in an attempt to meet the ever increasing demand on blood stocks. A number of studies have shown the benefits of autotransfusion in planned vascular, transplant and orthopaedic surgery. However, it does not appear to have been taken up in
the UK for either the initial resuscitation or the ongoing treatment of major trauma patients.

Trauma patients make significant demands on blood bank stocks. Homologous blood transfusion is not entirely without risks, e.g. transmission of infection and both haemolytic and non-haemolytic transfusion reactions. Cross-matching of blood takes at least 45 min in most centres and transfusion of group specific blood in life-threatening circumstances is known to be associated with an increased risk of adverse reactions. It is therefore surprising that greater use of autotransfusion has not been made in such patients.

A review of the recent American literature confirms the use of autotransfusion in trauma centres there. Its use is still evolving in terms of determining which patients are most likely to benefit. A study in Denver, Colorado\(^5\) concluded that age, injury mechanism and the presence of shock were not predictors of usefulness, but that an initial haematocrit <35\% and a requirement >2\% colloid for initial resuscitation did indicate a potential role.

General agreement seems to exist that autotransfusion has a place in the management of traumatic haemothorax. A study in 1987 from Paris\(^4\) highlighted the successful use of autotransfusion in the pre-hospital care of 18 patients with life-threatening haemothorax, drained via a standard chest drain. They received an average of approximately 41 of autotransfused blood. Thirteen survived to undergo successful thoracic surgery. Such treatment should not be beyond the skills of any flying squad or major accident and emergency department and the minimal delay in attaching the autotransfusion system to the chest drain need not delay definitive surgery. It may be a life-saving measure for the few patients requiring transfer to a regional thoracic unit, when it may not be possible to wait for homologous blood to be cross-matched.

There is clearly a role for autotransfusion in the management of major trauma. The extent of that role is still being evaluated in the USA, and no doubt will broaden with experience and improved technology. However, the only way for us to define its role in major injury in the UK is to start using it in this context and audit the results.

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The management of chest pain in the accident and emergency department

A number of studies have highlighted deficiencies in the initial management of acute myocardial infarction in accident and emergency (A&E) departments. Marked delays in the ‘door-to-needle’ times for thrombolysis have been noted. This initial management in the A&E department is instrumental in minimizing these delays.

Johnson & Williams\(^1\) comment on the delay in their A&E department of five patients who underwent thrombolysis. They infer that in at least two patients there were sizeable delays on critical care unit (CCU) before thrombolysis was administered. They also felt that the Leicester group had not addressed this aspect of the problem.\(^2\)

In December 1991 and January 1992, a departmental repeat audit on the management of acute cardiac pain in A&E was carried out at the Leicester Royal Infirmary. Out of 67 patients, 17 received thrombolysis. The A&E senior house officer (SHO) on average spent 25 min before referring the patient to the CCU senior house officer. Some 9 min was spent waiting for him/her to arrive. It took a further 32 min on average before the patient was transferred to CCU and then some 33 min before he/she received thrombolysis. A total mean time of 99 min.

The results, presented at a joint A&E and CCU meeting were felt to be very poor.

A more formal refinement of the ‘fast tracking’ in A&E was produced and the CCU staff discussed ways of reducing the substantial delays on their unit. Since then, initial figures show that the times have in most cases been halved. A programme of more frequent re-evaluation has been set up and the results will be published at a later date.

Audits, their results, conclusions and recommendations are easily forgotten in the hospital environ-