Stress fracture of the capitate

A 42-year-old male physical exercise teacher presented to his general practitioner (GP) with a 4-month history of bilateral wrist pain. He was unable to recall any specific episode of trauma, but the nature of his work as a gymnastics teacher required repeated dorsiflexion of both wrists. The pain was enough to keep him awake at night and he had developed stiffness and paraesthesia in both hands, particularly the left. On examination he had full range of movement at the left wrist joint, but had a positive phalen's sign. He was diagnosed by his GP as having carpal tunnel syndrome, however, treatment with local steroid injection and splinting had produced only partial relief.

On presenting to the accident and emergency (A&E) department, physical findings were unchanged and radiographs of the left wrist showed a fracture of the capitate with established non-union (Fig. 1). Magnetic resonance imaging (MRI) confirmed non-union, but showed no evidence of avascular necrosis. (Fig. 2). In view of his symptoms of carpal tunnel syndrome the patient underwent bilateral carpal tunnel decompression, which was followed by complete resolution of the symptoms.

Fractures of the capitate are uncommon, accounting for approximately 1.3% of all carpal fractures.¹ When it does occur it is often associated with other carpal fractures or dislocations.² The mechanism of injury is usually a fall onto the outstretched hand, direct violence to the dorsum of the hand or an extreme flexion force. One case of a stress fracture has previously been reported, occurring in a dock worker.³

Demonstration of capitate fractures may be dif-

Fig. 1. Radiograph showing fracture of the capitate with established non-union in left wrist.

Fig. 2. MRI showing non-union although no evidence of avascular necrosis.

ficult² and if doubt exists then isotope bone scanning or computerized tomography may be helpful.⁴

Avascular necrosis is an uncommon occurrence. The proximal pole of the capitate receives its blood supply exclusively in a retrograde fashion across the waist, in a manner analogous to the scaphoid. This vascular supply may be disrupted after both major and relatively minor trauma (the naviculo-capitate syndrome).⁵ Avascular necrosis of the capitate resulting from dorsiflexion compression injuries in gymnasts may occur as a result of microfractures.

Treatment for isolated fractures of the capitate is usually immobilization in a cast for 6 weeks² with internal fixation reserved for cases with displacement or dislocation.^{6,7} Partial resection and intercarpal fusion may be required when avascular necrosis is present.

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H. ALLEN, W.W. GIBBON & R.J. EVANS

*Department of Emergency Medicine,
Cardiff Royal Infirmary,
Newport Road,
Cardiff*

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 eyes³⁻⁵ and minor burns of the hands and fingers due to escape of hot gases from the rear of the exploded bag in the car.⁵ Second degree burns of the front of the neck 'in a striated pattern' due to air-bag explosion have been reported previously,⁵ 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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J.L. BURTON

*Department of Dermatology,
Bristol Royal Infirmary,
Bristol BS2 8HW*

Waste of a precious resource?

The concept of autotransfusion is over a century old¹ 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