Dislocation of the sternoclavicular joint: delayed diagnosis with an unusual complication

A 38-year-old male mine worker was immobilised on a spine board and brought into the casualty department by ambulance after being involved in a rock-fall. He was fully conscious, but drowsy and complained of headache, neck pain and right shoulder pain. On arrival his BP was 110/64, pulse rate 115/minute and respiratory rate15/minute. On examination, contusions to the head, chest and back were noted with no further clinical abnormality.

X-rays of the skull, cervical spine, chest, right shoulder and right scapula were ordered. No fractures were demonstrated and the cervical spine and shoulder joint alignments were normal. The chest X-ray, taken supine, showed prominence of the mediastinal shadow but the aortic knuckle was clearly defined, there were no pleural caps and the appearance was within normal limits for the supine projection. The patient was admitted to the surgical ward for observation with a diagnosis of multiple contusions and concussion. He was discharged 3 days later. Seven days after the initial injury and 4 days after discharge the patient presented to OPD complaining of persistent pain in the right shoulder and chest. His temperature was 38.2°C. Neurological examination was normal, as was auscultation of the heart and lungs. The right shoulder showed a good range of movement. A course of ibuprofen was prescribed and the patient instructed to return in 3 days (10 days after the initial presentation) for review.

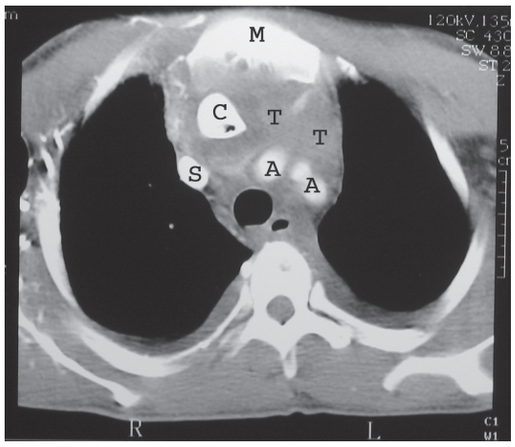

Fig.1. An axial CT scan through the mediastinum with intravascular contrast. Note (i) abnormal position of dislocated medial end of the right clavicle within the anterior mediastinum behind the manubrium, and (ii) extensive abnormal soft-tissue density within the anterior mediastinum with slightly lower density surrounding the dislocated medial end of the clavicle. C = medial end of clavicle; S = contrasted opacified superior vena cava; A = apex of aortic arch/origin of great vessels; T = abnormal soft-tissue density within the anterior mediastinum; M = manubrium.

At review, the patient complained of increasing (now severe) pain in the chest and right shoulder, bouts of fever and the recent onset of dysphagia. Examination revealed an acutely ill patient with a temperature of 39.6°C, BP 94/56, pulse rate 126/minute and tachypnoea. On auscultation there were bilateral coarse crepitations. His white cell count was 20.7 x 10^9/l and the CRP was 171.8 mg/l. A repeat chest X-ray, taken PA, erect, now showed a clearly widened right upper mediastinal margin. The aortic knuckle remained clearly defined. There were no pleural changes and the lung fields were clear. Of note was asymmetry in the upward slope of the clavicles and in the position of the medial ends of the clavicles despite the fact that there was no significant rotation of the patient on the film. The following differential diagnoses were considered:

- mediastinal haematoma/aortic dissection
- oesophageal injury (in view of dysphagia)
- dislocation of the medial end of the right clavicle.

The patient was referred for a CT scan of the chest (Fig. 1). This revealed posterior dislocation of the right clavicle with the (medial) head lying anterior to the apex of the aortic arch. Extensive soft-tissue density is shown within the anterior mediastinum consistent with haematoma. Surrounding the dislocated medial end of the clavicle is a rim of slightly lower density, consistent with pus. In view of the possibility of major vascular injury, an angiogram of the aortic arch was performed. This was normal, excluding a major vascular injury prior to thoracotomy.

A diagnosis of right posterior sternoclavicular dislocation with mediastinal haematoma and probable abscess was made and a median sternotomy was done, with extension of the incision over the right clavicle. The medial end of the right clavicle was found to be non-viable and was resected and the abscess drained. Culture of the pus revealed *Salmonella* and *Acinetobacter* organisms. Postoperatively

the patient developed septic shock and required mechanical ventilation, IV antibiotics and inotrope support for 12 days. He subsequently made a full recovery and was able to return to work.

Discussion

Dislocations of the sternoclavicular joint can be anterior or posterior. Anterior dislocation of the clavicle is the more common injury and results in superior displacement of the clavicle relative to the normal side. Posterior displacement is less common but more dangerous. This is because there can be associated injury to the great vessels just below the thoracic inlet. The veins are more frequently compromised than the arteries. The trachea may also be compressed. Dysphagia is well recognised as part of the symptom complex.

Sternoclavicular joint dislocation is an uncommon injury and is notoriously difficult to diagnose with routine radiographs, due to overlying soft tissue and bony structures. While a frontal projection, plain film radiograph may demonstrate widening of the joint or overlap of the medial clavicle and manubrium, CT is the preferred modality in the evaluation of this injury.

Posterior dislocation of the clavicle at the sternoclavicular joint is almost always the result of trauma and is recognised following motor vehicle accidents and in American football players who get 'dog piled' while in a lateral position. The diagnosis of sternoclavicular joint dislocation requires awareness of the possible injury and a high index of suspicion in cases where there is possible injury to the bony thorax.

The development of a mediastinal abscess in association with sternoclavicular dislocation must be very unusual, particularly as this was a closed injury. We have been unable to find a specific previous description of abscess as a complication. We postulate that haematogenous spread of the infecting organism resulted in sepsis developing within mediastinal haematoma. The presence of devitalised bone would have been a predisposing factor. The patient was subsequently found to be immunocompromised because he was HIV-positive, and this is likely to have been a further significant factor in the development of sepsis in this instance.

It is recommended that any patient on whom an initial chest radiograph is taken supine should, as a matter of routine, have a follow-up erect PA chest radiograph for re-evaluation, particularly prior to discharge in the event of an admission following trauma. (In this patient a follow-up erect PA chest radiograph was unfortunately not obtained prior to discharge.)

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SINGLE SUTURE

DOCTORS AND IMMUNISATION

Do doctors immunise their own children? We might expect the answer to be an unequivocal yes, but this is not the case, according to a recent report in Pediatrics. Although 93% of doctors surveyed reported having their own children vaccinated according to the current recommended vaccination guidelines, about 10% of non-paediatricians delayed giving their children some of the immunisations. Both groups of doctors, however, gave their own children additional immunisations over and above those recommended. It was the combination immunisations, MMR and DTP, that were either delayed or omitted, suggesting that these doctors still have misconceptions about 'overloading' a child's immune system. This is a worry as they are the very people who will be advising the general public on the use of immunisation.

Posfay-Barbe KM, *et al. Pediatrics* 2005; **116:** e623-e633.