

ity of collisions seen in rugby football in the past few seasons is a source of concern for many team doctors.

The importance of early diagnosis and treatment for posterior dislocation of the sternoclavicular joint has been previously described.<sup>4</sup> The proximity of a number of vital structures to the posteriorly displaced medial clavicle may result in pneumothorax, haemothorax, and compression or laceration of the great vessels. Our case demonstrates the potential for similar complications with posterior displacement of the first rib synchondrosis. We suspect that similar injuries are underdiagnosed as a result of a low index of clinical suspicion amongst sports physicians, difficulty in accurately palpating the first rib costal cartilage, and the lack of sensitivity of plain radiography in this condition. Our initial x ray views included postero-anterior sternoclavicular views with 45° of trunk rotation and a supine anteroposterior view of the first rib. In view of the potential for serious complications, both at the time of injury and also if an inappropriately early return to contact sporting activity is made, we would highlight the importance of early diagnosis of this injury.

CT is definitive as to the direction and magnitude of displacement and will clearly define the presence of an associated fracture. It will also show any encroachment on the mediastinum and neurovascular structures. Although

ultrasound<sup>5</sup> and magnetic resonance imaging have been proposed as alternative imaging modalities, we recommend CT in all cases in which significant injury to the first rib synchondrosis is suspected.

Treatment options for displaced costochondral injuries are poorly described in the literature. They include conservative treatment or closed reduction under general anaesthesia. If open reduction and fixation is necessary, the risk of migration of fixation devices should be considered.<sup>6</sup> In the absence of evidence implicating the posterior vital structures, conservative treatment may be most appropriate.

We would highlight the importance of specifically assessing the first rib synchondrosis in addition to the sternoclavicular joint in situations where significant compressive forces are applied to the shoulder.

- 1 Gupta A, Jamshidi M, Robin JR. Traumatic first rib fractures: is angiography necessary? A review of 73 cases. *Cardiovasc Surg* 1997;5:48-53.
- 2 Barret GR, Shelton WR, Miles JW. First rib fractures in football players. A case report and literature review. *Am J Sports Med* 1988;16:674-6.
- 3 Lanken PA Jr, Micheli LJ. Stress fracture of the first rib. A case report. *J Bone Joint Surg* 1985;67:159-60.
- 4 Marker LB, Klaresov B. Posterior sternoclavicular dislocation: an American football injury. *Br J Sports Med* 1996;30:71-2.
- 5 Jourgon JB, Lepront DJ, Dromer CE. Echography in injuries of costal cartilages. *J Radiol* 1993;74:409-12.
- 6 Lyons FA, Rockwood CA Jr. Migration of pins used in operations on the shoulder. *J Bone Joint Surg [Am]* 1990;72:1262-7.

## Simultaneous bilateral elbow dislocation in an international gymnast

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### Abstract

**Elbow dislocation is a rare injury in elite athletes. We report an unusual case of simultaneous bilateral elbow dislocations with a unilateral radial head fracture in an international female athlete competing on the asymmetrical bars. These injuries require prompt reduction and immediate mobilisation if an abrupt end to a promising career is to be prevented.**

(*Br J Sports Med* 1999;33:132-133)

Keywords: elbow; dislocation; fracture; radial head; gymnastics

Elite female gymnasts may train on average 5.36 days a week and 5.04 hours a day,<sup>1</sup> which exposes them to a high risk of serious injury. Elbow dislocations in female athletes are not uncommon but bilateral dislocations are very rare and to our knowledge only two cases have been described.<sup>2,3</sup> The first case highlighted the problem of irreducibility in these patients, while in the second case associated medial epi-

condyle fractures were trapped within the elbow joint after reduction, emphasising that post-reduction films should be scrutinised carefully for the presence of associated fractures. Both cases were confined to amateur athletes.



Figure 1 Radiographs showing bilateral posterior elbow dislocations. (A) Dislocated left elbow; (B) dislocated right elbow with radial head fracture.

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Accepted for publication  
26 November 1998

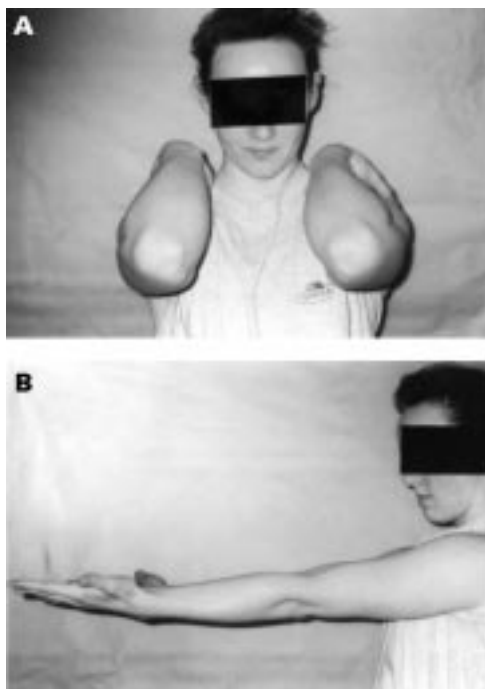


Figure 2 Clinical photographs of the patient showing full range of movement at five months. Reproduced with the patient's permission.

We report a case of bilateral simultaneous posterior elbow dislocations with an associated radial head fracture occurring in a seasoned gymnast.

### Case report

A 20 year old international female gymnast, performing on the asymmetrical bars in a competition was unable to catch the lower bar during a transfer from the bar above. She fell, landing on her outstretched hands with her elbows in an extended position. Radiographs showed bilateral posterolateral elbow dislocations with a unilateral radial head fracture (fig 1).

There was no neurovascular deficit. Both elbows were reduced under sedation within an hour of the injury. The radial head fracture was undisplaced. She was splinted at 90° of flexion for a day and then referred for physiotherapy. By the end of the 8th week the patient had regained full range of movement and at five months she was back to her previous performance level (fig 2).

### Discussion

Simple dislocations account for 11–28% of all injuries to the elbow.<sup>4</sup> In a Swedish study over a period of 12 years involving 178 patients with elbow dislocations, most of the cases were young people involved in sporting activities.<sup>5</sup> The mechanism of posterior elbow dislocation is unclear. The commonest presentation is a fall on the extended elbow. The body weight

generates a downward force with a vertical and a horizontal component which unlocks the ulna out of the trochlea. As the joint continues to hyperextend, the anterior capsule and the collateral ligaments fail, resulting in a posterior dislocation.<sup>6</sup> The rarity of bilateral elbow dislocation stems from the fact that it may only occur under special circumstances with both the elbows extended and most of the body weight acting through the elbow joints. Such dislocations have only been reported in female gymnasts, and the explanation may lie in their ability to hyperextend joints because of ligament laxity. This puts them at a higher risk of serious injury than their male counterparts. Historically dislocations have been immobilised for between two and four weeks. This has led to complications like adhesions, fibrosis, and contractures.<sup>7</sup> Protzman<sup>8</sup> reported a flexion contracture of 3° in 27 patients with less than five days of immobilisation as compared with 21° in seven patients who had more than three weeks of splinting. After closed manipulation, stability of the elbow joint should be tested, and in the presence of instability a protective brace may be worn to assist early mobilisation.<sup>6</sup> Demonstrable instability, however, is not an indication for operative repair.<sup>9</sup>

Our patient was mobilised as soon as the pain subsided (one day), even though the elbow was massively swollen and bruised. At the end of two months she had completely recovered full range of motion and resumed her gymnastic activities at five months. On final review at 18 months she had no residual symptoms from her injury.

Bilateral elbow dislocations are career threatening injuries in gymnasts. Our report stresses the importance for the treating physicians in the accident and emergency and orthopaedic departments to be aware of the importance of early mobilisation in these patients, which could make the difference between an end to a promising career and a gold medal.

- 1 Caine D, Cochrane B, Caine C, *et al.* An epidemiologic investigation of injuries affecting young competitive female gymnasts. *Am J Sports Med* 1989;17:811–20.
- 2 Maitra A K. A rare case of bilateral simultaneous posterior dislocation of the elbow. *Br J Clin Pract* 1979;33:233–5.
- 3 Tayob AA, Shively R A. Bilateral elbow dislocation with intra-articular displacement of medial epicondyle. *J Trauma* 1980;20:322–5.
- 4 Wilson A. Bilateral elbow dislocation. *Aust N Z J Surg* 1990; 60:553–4.
- 5 Josefsson P O, Nilsson B E. Incidence of elbow dislocation. *Acta Orthop Scand* 1986;57:537–8.
- 6 Hotchkiss RN. Fractures and dislocations of the elbow. In: Rockwood CA, Green DP, Buchholz RW (eds). *Fractures in adults*. Philadelphia: Lippincott-Raven, 1996:781.
- 7 Melhoff TL, Noble PC, Benett JB, *et al.* Simple dislocation of the elbow in the adult. Results after closed treatment. *J Bone Joint Surg [Am]* 1988;70:244–9.
- 8 Protzman RR. Dislocation of the elbow joint. *J Bone Joint Surg [Am]* 1878;60:339–41.
- 9 Josefsson PO, Gentz CF, Johnell O, *et al.* Surgical versus non-surgical treatment of injuries following dislocation of the elbow joint. A prospective randomized study. *J Bone Joint Surg [Am]* 1987;69:605–8.

### Take home message

Early mobilisation after reduction of a dislocated elbow in an athlete should be the first consideration to enhance the prospects of a return to the sport.