Case reports

Fractured coracoid with anterior shoulder dislocation and greater tuberosity fracture—report of a bilateral case

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A 33-year-old man, right-handed, without epilepsy, was admitted to our department with a bilateral anterior shoulder dislocation sustained during a hypoglycemia-induced convulsion resulting from diabetes. The patient's shoulders appeared symmetric and "squared off" laterally. He had no neurological deficits or vascular injuries. Radiographs revealed bilateral anterior subglenoid dislocations, bilateral fractures of the greater tuberosity and bilateral non-displaced fractures of the tip of the coracoid process (Figures 1 and 2). Both dislocations were reduced under intravenous sedation. After reduction, radiographs and CT scan showed a good position of the fragments of the left shoulder (Figure 3), but a persistent anterior dislocation of the right humeral head associated with posterior displacement of the greater tuberosity (Figure 4). The left shoulder was treated with a sling for 3 weeks, followed by rehabilitation. We performed an open reduction on the right shoulder using a delto-pectoral approach without section of the subscapularis muscle. The greater tuberosity was anatomically reduced and fixed by 2 cancellous screws, but the shoulder remained unstable because of a fracture of the anterior glenoid cavity. We performed an anterior osteoplastic ridge using the avulsed coracoid process fragment with its tendinous and muscular insertions. Postoperatively, the right shoulder was placed in a sling during 3 weeks. 7 months after surgery, the patient was able to work as a packer. On reexamination 2 years later, he had normal painfree active movements of both shoulders, without apprehension or instability. Radiographs showed a good fusion of the fractures and of the osteoplastic ridge.

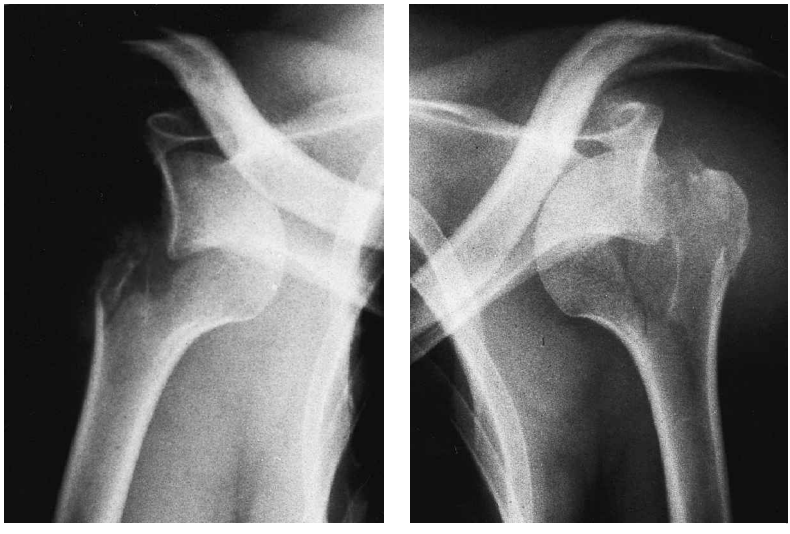

Figure 1. Frontal view of the right and left shoulders demonstrating bilateral anterior subglenoid dislocations associated with bilateral greater tuberosity fractures.

Discussion

Bilateral anterior shoulder dislocations may occur after violent trauma, electrocution and epileptic convulsions (Hartney-Velazco et al. 1984, Ribbans 1989, Markel and

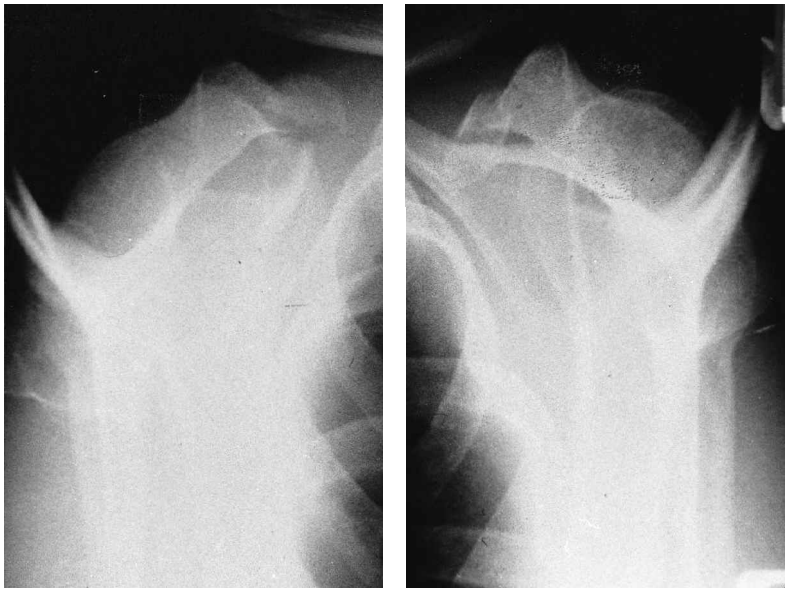

Figure 2. Lamy's sagittal view of the right and left shoulders provides good visualization of the coracoid process fracture.

Blasier 1994). Greater tuberosity or humeral head fractures may accompany anterior dislocations of the shoulder (Neer 1974, Duparc and Largier 1976). On the other hand, coracoid fractures are uncommon and rarely occur in association with shoulder dislocations (Benchetrit and Friedman 1979, Wong-Pack et al. 1980, Garcia-Elias and Salo 1985). To our knowledge, the association of a coracoid process and greater tuberosity fracture in shoulder dislocation is very uncommon (Goodier et al. 1994). The coracoid fracture can be easily missed on anteroposterior radiographs of the shoulder. A lateral axillary view shows the lesion (Benchetrit and Friedman 1979, Wong-Pack et al. 1980), but is impossible to perform when the patient has pain or the shoulder is dislocated. Garth's apical oblique projection can be used with little discomfort or manipulation (Garth et al. 1984, Garcia-Elias and Salo 1985). In our case, Lamy's sagittal view of the scapula showed the coracoid lesion very clearly (Figure 2). Coracoid fractures are classified into two types: type I fractures are located behind the coracoclavicular ligaments and usually treated by open reduction and fixation. The type II is anterior to these ligaments and most often managed without surgery as in our case (Ogawa et al. 1996). Two mechanisms probably produce a fracture of the coracoid process when the shoulder dislocates. One is an avulsion resulting from a violent contraction of the pectoralis minor and the conjoined tendon of the biceps and coracobrachialis muscles attached to

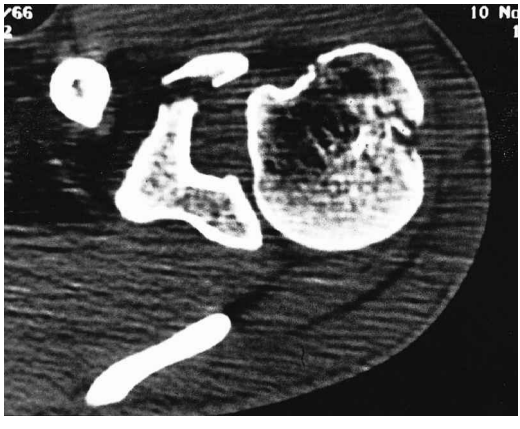

Figure 3. CT scan transversal view of the left shoulder showed relocation of the humeral head with anatomical reduction of the greater tuberosity.

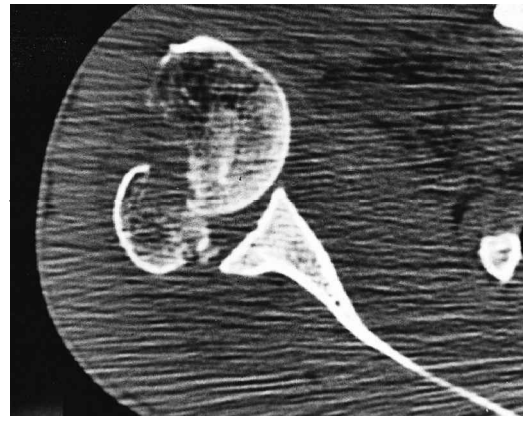

Figure 4. Persistent anterior dislocation of the right humeral head with an unreduced greater tuberosity fragment on CT scan transversal view.

the coracoid process, the other is a direct impact of the dislocated humeral head against the lateral side of the coracoid process. The first mechanism occurs mainly with subglenoid dislocations as in our case (Féry and Sommelet 1979, Garcia-Elias and Salo 1985). The treatment of concurrent fracture of the greater tuberosity and anterior dislocation of the shoulder is usually nonoperative, using a sling for 3–6 weeks, after closed reduction of the fracture is attempted. We used this treatment on the left shoulder of our patient with a good outcome. Surgery is necessary in persistent instability due to an unreduced lesion (Markel and Blasier 1994). On the right shoulder, open reduction and fixation of the greater tuberosity were insufficient to obtain a stable gleno-humeral joint considering the fracture of the anterior glenoid cavity. Stability was obtained with Latarjet's procedure (Saragaglia et al. 1994).

Benchetrit E, Friedman B. Fracture of the coracoid process associated with subglenoid dislocation of the shoulder. J Bone Joint Surg (Am) 1979; 61: 295-6.

Duparc J, Largier A. Les luxations-fractures de l'extrémité supérieure de l'humérus. Rev Chir Orthop 1976; 62: 91-110.

Féry A, Sommelet J. Fractures de l'apophyse coracoide: à propos de 10 observations. Rev Chir Orthop 1979; 65: 403-7.

Garcia-Elias M, Salo J M. Non-union of a fractured coracoid process after dislocation of the shoulder. A case report. J Bone Joint Surg (Br) 1985; 67: 722-3.

Garth W P, Slappey C E, Ochs C W. Roentgenographi c demonstration of instability of the shoulder: the apical oblique projection. A technical note. J Bone Joint Surg (Am) 1984; 66: 1450-3.

Goodier D, Maffulli N, Good C J. Coracoid process and greater tuberosity fracture in unreduced shoulder dislocation. Injury 1994; 25: 113-6.

Hartney-Velazco K, Velazco A, Fleming L L. Bilateral anterior dislocation of the shoulder. South Med J 1984; 77: 1340-1.

Markel D C, Blasier R B. Bilateral anterior dislocation of the shoulders with greater tuberosity fractures. Orthopedics 1994; 17: 945-9.

Neer C S. Displaced proximal humeral fractures. J Bone Joint Surg (Am) 1974; 52: 1077-103

Ogawa K, Yoshida A, Takahashi M, Ui M. Fractures of the coracoid process. J Bone Joint Surg (Br) 1996; 78: 17-9.

Ribbans W J. Bilateral anterior dislocation of the shoulder following a grand-mal convulsion. Br J Clin Pract 1989; 43: 181-2.

Saragaglia D, Picard F, Gérard Ph, Tourne Y, Leroy J M. L'instabilité antérieure de l'épaule associée à la fracture du processus coracoïde. Rev Chir Orthop 1994; 80: 651-5.

Wong-Pack W K, Bobechko P E, Becker E J. Fractured coracoid with anterior shoulder dislocation. Can Assoc Radiol J 1980; 31: 278-9.