

Ipsilateral dislocation of the shoulder and elbow joints with contralateral comminuted humeral fracture

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ABSTRACT

Ipsilateral dislocation of the shoulder and elbow joints is a rare and complex injury. During the last 25 years, only 3 cases have been reported in the literature. We report a 50-year-old woman who suffered ipsilateral elbow and shoulder dislocation with contralateral comminuted humeral fracture. Both shoulder and elbow joints were reduced, but the elbow was dislocated subsequently at follow-up. The reduction in the elbow was stabilized by a Kirschner wire that was removed at 3 weeks, and the elbow was then stable. A U-shaped coaptation splint was applied for the contralateral comminuted humeral fracture. At 6 months, she had acquired a nearly full range of motion of both shoulder and elbow with complete healing in the contralateral humerus. Although rare and complex, ipsilateral shoulder and elbow dislocation, which is the result of a high-energy trauma, can be treated conservatively.

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Ipsilateral dislocation of the shoulder and elbow is a rare and complex injury. The mechanism of the injury is not certain, but the force transmitted through the forearm with the elbow flexed, and the shoulder externally rotated may be the possible cause.¹ During the last 25 years, only 3 cases have been reported.¹⁻³ We report a 50-year-old woman, who suffered such an injury and was treated conservatively. Reporting this case is to illustrate a treatment plan for ipsilateral dislocation of the shoulder and elbow joints.

Case Report. A 50-year-old woman was admitted to our Emergency Clinic after being struck by a car while crossing the road. Obvious deformity and pain in the left shoulder and elbow joints were noticed on the first clinical examination, performed in the Emergency Room (ER). Circulation and nerve

functions were intact in her left upper extremity. She had also radial nerve paresis in the right upper extremity accompanying deformity in the humerus. Plain radiographs of the upper extremities revealed the anteroinferior dislocation of the left shoulder with moderate displaced, 2-part greater tuberosity fracture,⁴ posterior dislocation of the left elbow, and comminuted fracture of the right humerus (**Figures 1a to 1d**). After the elimination of head, chest, spine, abdominal, and lower limb injuries, she was administered in 50 mg intramuscular Pethidine HCl and 3 mg intravenous Midazolam for sedation analgesia. A U-shaped coaptation splint was applied for the right humerus fracture. The elbow joint was reduced first, but then, the test examination pointed to instability with recurrent dislocation. In the ER, reduction of the ipsilateral shoulder dislocation could not be achieved

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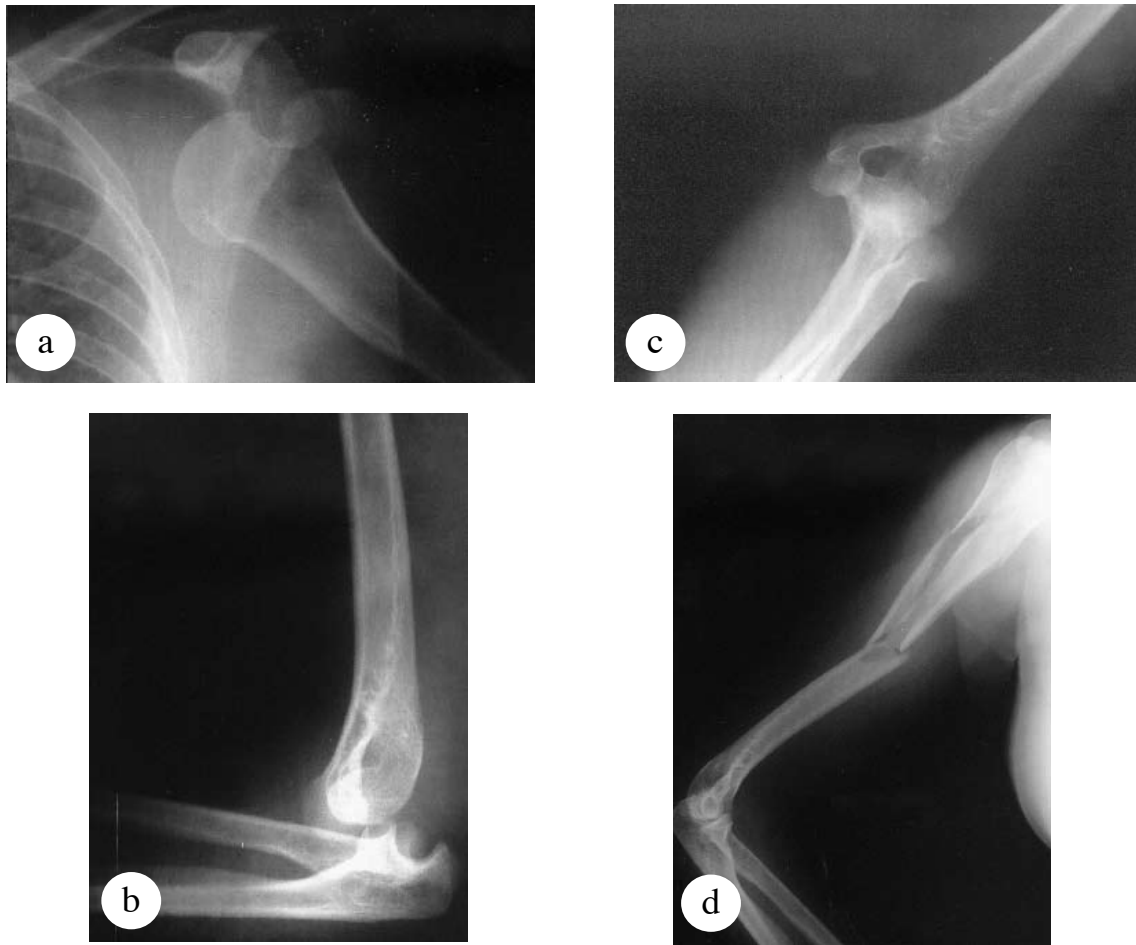


Figure 1 - Initial x-rays of the left shoulder, elbow, and right humerus a) Anteroposterior dislocation and fracture of greater tuberosity in the left shoulder. b) Posterior dislocation of the left elbow in the lateral view. c) Anteroposterior view of the elbow. d) Comminuted fracture in the right humerus.

and she was sent to the Operating Room (OR). The shoulder was reduced under general anesthesia (using Cocher's maneuver), and the elbow was stabilized in 90° flexion with a 3 mm Kirschner wire from the olecranon to the humerus. Post-reduction radiographs revealed the concentric reduction of the shoulder, and the elbow joints with the return of the greater tuberosity to its original position (**Figures 2a & 2b**). Shoulder reduction was stabilized by body bandage. On the third week, the Kirschner wire in the elbow was removed to prevent restrictive adhesions, and passive mobilization was started (**Figure 2c**). Immobilization in the shoulder was prolonged for 4 weeks, and active mobilization was then initiated for both the shoulder and the elbow joints. On the sixth week, radial nerve dysfunction clinically returned to normal in her right upper extremity. The comminuted

humeral fracture healed at 12 weeks (**Figure 2d**). On 6 months follow-up, she had acquired a nearly full range of motion of both shoulder and elbow.

Discussion. Although ipsilateral dislocation of the shoulder and elbow joints is a rare injury, 3 cases have been reported in the literature.¹⁻³ The similarity of these patients to our case is that, all were exposed to high-energy trauma, the difference being that the dislocation of the shoulder was initially missed in all the reported cases. The accompanying comminuted fracture of the right humerus, distinguishes our patient from the reported cases. However, the other cases were in the third decades, whereas our patient was 50-year-old, at an advanced age. However, Khan and Mirdad¹ reduced the dislocations by intravenous sedation along with analgesics, while Suman³ and Ali

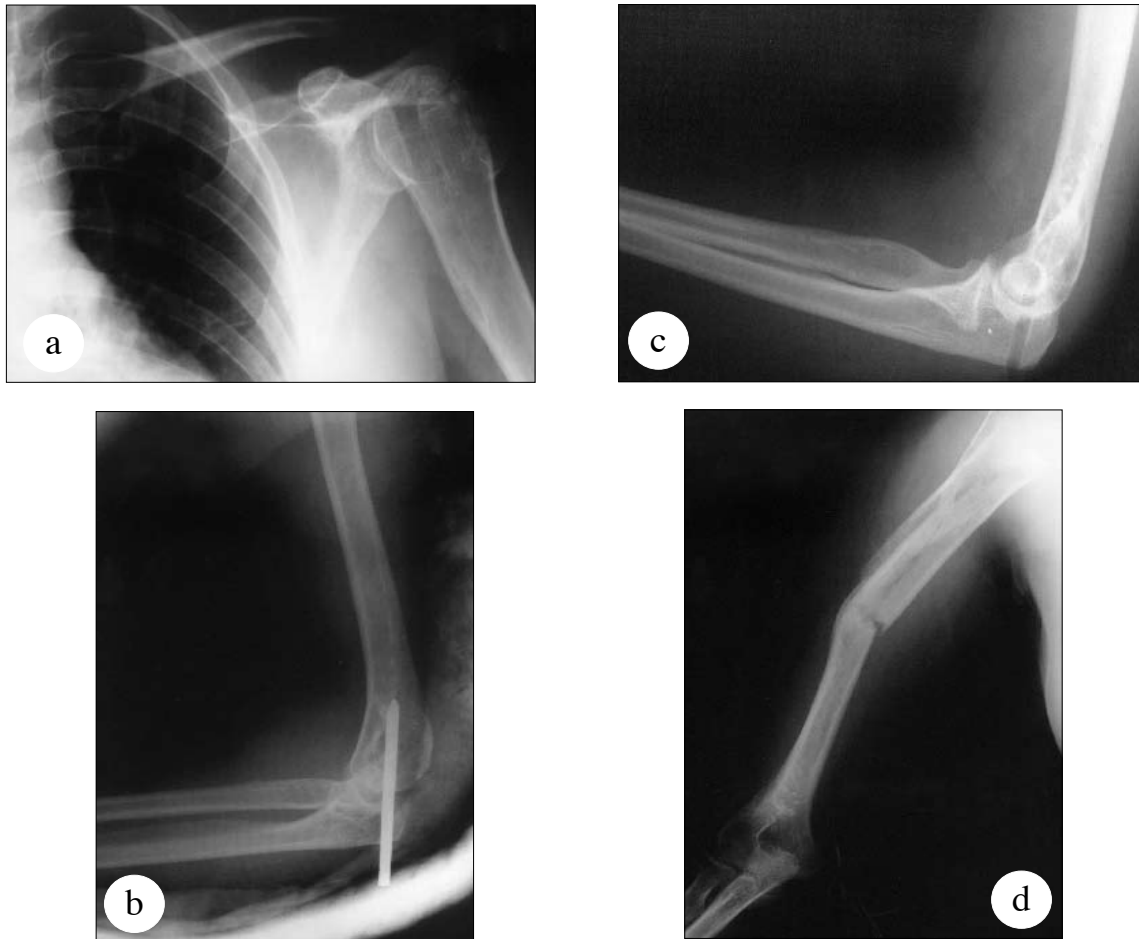


Figure 2 - Final x-rays of the left shoulder, elbow and right humerus **a)** Fracture of greater tuberosity reduced after closed reduction of the shoulder. **b)** After closed reduction the elbow was fixed in 90° flexion with a Kirschner wire. **c)** At 3 weeks, after removal of the Kirschner wire. **d)** The healed comminuted humeral fracture at 12 weeks.

et al² reduced them under general anesthesia. In our case, general anesthesia was performed due to the failure of reduction in the ER and our patient's being free from alcohol. Although Suman³ and Ali et al² did not mention the sequence of reduction, Khan and Mirdad¹ stated that reduction of the elbow first, would assist the reduction of the shoulder. We followed the same sequence as stated by Khan and Mirdad¹, the elbow first and then the shoulder. Since the elbow was not stable, however, the shoulder could not be reduced in ER. For this reason, the shoulder was reduced in OR under general anesthesia, while the elbow was in a reduced position. And reduction of the elbow was stabilized with a stout Kirschner wire, transfixing the olecranon and the humerus. In our opinion, the elbow should be reduced first in ipsilateral shoulder and elbow dislocation.

It was suggested that for stability, after reduction of old unreduced dislocations, Kirschner wire or Steinman pins can be used, transfixing the olecranon and the humerus, or transfixing the capitellum and radial head.⁵⁻⁷ In our case, instability of the elbow continued in spite of reduction and no osseous injury was seen in roentgenograms. Thus, for stability we used a Kirschner wire transfixing the olecranon and the humerus, despite the absence of old unreduced dislocations. Although, Billet⁵ suggested that reduction should be maintained by 2 stout Kirschner wires, we obtained stable reduction with one Kirschner wire and no breaking was seen.

Avulsion fractures of the tuberosities may result from a variety of mechanisms, but most commonly occur as a result of seizures or secondary to glenohumeral dislocations. These often reduce

anatomically with reduction of the humeral head and can be managed non-operatively.⁸ In our case, greater tuberosity was reduced anatomically following the reduction of the shoulder and maintained its position in the follow-up period. Dislocation of the elbow can damage the median, ulnar, or anterior interosseous nerves.⁸ Although, most of these cases involve, simple neuropraxia that resolves quickly, no nerve damage was seen in our case.

In recent years, due to the increase rapidity of the vehicles, injuries from traffic accidents are high-energy traumas. For this reason, multiple fractures and dislocations may occur in patients. For this kind of high-energy trauma, routine careful examination, and x-ray investigation, the adjacent bones and joints of the major affected limbs should protect against missed diagnosis. Consequently, ipsilateral dislocation of the shoulder and the elbow joints can be treated successfully using conservative treatment.

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