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Case Report

Ipsilateral fracture dislocation of the shoulder and elbow: A case report and literature review

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ABSTRACT

Ipsilateral dislocation of the shoulder and elbow is an uncommon injury. A literature review identified nine previously described cases. We are reporting a unique case of ipsilateral posterior shoulder dislocation and anterior elbow dislocation along with concomitant intra-articular fractures of both joints. This is the first report describing this combination of injuries. Successful treatment generally occurs with closed reduction of ipsilateral shoulder and elbow dislocations, usually reducing the elbow first. When combined with a fracture at one or both locations, closed reduction of the dislocations in conjunction with appropriate fracture management can result in a positive functional outcome.

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1. Introduction

Ipsilateral fracture dislocation of the shoulder and elbow is an uncommon injury. As one might expect this combination is usually the result of high-energy forces. A search was made in PubMed and the Google database, which identified only nine previously reported cases in the English literature.^{1–9} All nine had an anterior shoulder dislocation and a posterior elbow dislocation. Five of these nine cases included a fracture at one location or the other.^{1–5} The following unique case included a posterior fracture dislocation of the shoulder and an ipsilateral anterior fracture dislocation of elbow. Such a combination of injuries has not previously described.

2. Case report

A bus struck a 26-year-old male pedestrian. His injuries included a left posterior shoulder dislocation with a large humeral head impaction fracture involving approximately 50% of the articular surface, a fracture of the left scapular spine and acromion, and an ipsilateral grade IIIA open anterior transolecranon fracture dislocation of the left elbow (Figs. 1–3). The elbow fractures involved the olecranon, coronoid, and trochlea. The patient subsequently underwent multiple surgical procedures on his left upper extremity. His initial procedure on the day of injury began with debridement of the left elbow. The patient had a 22 cm stellate laceration

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Fig. 1 – Left humerus with fracture dislocation of elbow and shoulder.

over his left elbow with a circumferential degloving type injury. Devitalized skin, subcutaneous tissue and fascia were excised. Several small bone fragments completely devoid of any soft tissue were removed. The wound was subsequently irrigated with 12 L of low-flow pulsatile lavage. Gentle reduction of the anterior left elbow fracture dislocation was then performed. A spanning external fixator was placed across the left elbow joint and a vacuum-assisted closure dressing was applied. Next, attention was turned to closed reduction of the posteriorly dislocated left shoulder. This was successfully accomplished by gentle longitudinal traction and external rotation applied to the humeral shaft proximal to the ipsilateral elbow injury. Irrigation and debridement were repeated on the third and seventh days post injury. On the same day as his final cleaning, one-week post injury, the patient underwent removal of his vacuum-assisted closure dressing. He also had his left elbow spanning external fixator removed. The fracture of the left trochlea was reduced and fixed with two screws. The olecranon fracture was then reduced and internally fixed with a twelve hole olecranon plate (Fig. 4a and b).

Eleven days after being struck by the bus, the patient's left shoulder injuries were surgically addressed. A large fragment

of the humeral head had displaced into the infraglenoid recess. This osteochondral piece was anatomically reduced and fixed with two titanium 2.7 mm screws. Next, the anterior inferior gleno-humeral ligament with its avulsed bony attachment was anatomically positioned and fixed with a single 2.7 mm screw. Approximately 20% of the humeral head articular cartilage remained deficient as a reverse Hill–Sachs lesion. This defect was filled with human cancellous allograft bone mixed with blood. Six suture anchors were inserted in the subchondral bone circumferentially around the articular margin of the remaining cartilage defect. A graft jacket was placed over the bone-grafted defect, and held it in place with #2 FiberWire from the circumferential suture anchors. Next, a margin convergence rotator cuff repair was performed using bio-absorbable corkscrews. This was followed by re-attachment of the subscapularis, an anterior capsular shift using suture anchors, and a biceps tenodesis. The humeral head was no longer dislocating posterior, but it was mildly subluxed secondary to the large fracture of the scapular spine and acromion. The scapular spine fracture was stabilized with two 4.0 cannulated screws placed in lag fashion from the tip of the acromion into the spine of the scapula. A remaining longitudinal split in the acromion was further stabilized using a calcaneal locking plate as a tension band. Following repair off the acromion, the posterior subluxation of the humeral head was no longer present (Fig. 5a and b). Passive range of motion of the shoulder and elbow was started one month after the initial injury. Active assisted range of motion was initiated two weeks later. Unrestricted range of motion and strengthening exercises were encouraged after an additional two weeks, which was two months following the original injury. Eleven months following the original injury, the patient's shoulder remained stable with 160° of abduction and 170° of forward flexion. His elbow range of motion was 30–100° of flexion. All his fractures had healed uneventfully. However, because of complaints of irritation from his acromion plate and stiffness in his left elbow, the patient was returned to the operating room fourteen months following his original injury. He had arthroscopic removal of intra-articular loose bodies from the left elbow, removal of the plate and screws from his left olecranon and removal of the plate and screws from his left acromion (Figs. 6 and 7). Four months following these procedures (a year and six months following the original injury), the patient was seen in follow-up for the last time as he subsequently moved away. His had regained full pain free range of motion of the left shoulder. He had a 30-degree flexion contracture at the left elbow, and could actively flex to 100°.

3. Discussion

The reported cases of ipsilateral shoulder and elbow dislocations are summarized in Table 1.^{1–9} The mechanism causing combined shoulder and elbow dislocation probably involves transmission of significant energy through the upper extremity with the elbow flexed.^{1,3,6,7} Decreased muscle tone may increase the risk of this combined shoulder and elbow dislocation injury. Three of the reported patients were intoxicated,^{3,6,9} and one patient fell down a flight of stairs

Fig. 2 – a. Antero-posterior view; grade IIIA open fracture dislocation of left elbow. Note soft tissue swelling and damage (arrow – olecranon fracture). **b.** Lateral view; grade IIIA open anterior transolecranon fracture dislocation of left elbow. Note soft tissue swelling and damage (arrow – olecranon fracture). **c.** CT scan oblique view left elbow. **d.** CT scan lateral view left elbow.

following a syncopal attack secondary to postural hypotension.⁸ In contrast to the nine cases reported in the literature, our patient's elbow dislocated anterior. In addition, unlike the previous nine cases, however, our patient's shoulder dislocation was posterior rather than anterior. The patient

probably reflexively raised his arm with the shoulder forward flexed, the elbow flexed, and the forearm pronated to protect himself from the oncoming bus. The impact of the bus would produce an anterior force on the patient's forearm causing an anterior dislocation of the elbow, and a concomitant

Fig. 3 – a. Antero-posterior view; left shoulder dislocation reduced (wide arrow – osteochondral humeral head fracture; narrow arrow – fracture scapular spine). **b.** Antero-posterior view CT scan 3D reconstruction left shoulder (wide arrow – osteochondral humeral head fracture; narrow arrow – fracture scapular spine).

Fig. 4 – a. Antero-posterior view; left elbow following reduction and internal fixation. b. Lateral view; left elbow following reduction and internal fixation.

posteriorly directed force to the humerus causing the posterior shoulder dislocation. In addition, our case was the only one that included concomitant intra-articular fractures of both dislocated joints. Despite the complexity of ipsilateral shoulder and elbow dislocations, closed treatment is usually successful. All of the authors of the nine previously reported cases performed closed reduction of both joints. Every patient achieved a good functional outcome. Four of these authors described initially reducing the elbow followed by the shoulder.^{1,3,6,7} Reducing the elbow first provides a more stable limb, which makes the shoulder reduction easier. In one case with an ipsilateral open humeral shaft fracture,⁴ and another with an unstable elbow⁵ the shoulder reduction preceded the elbow reduction. Three authors did not describe the order of joint reduction.^{2,8,9} We elected to reduce the elbow first. Once the elbow was stabilized with a spanning external fixator, our

patient's posterior shoulder reduction was reduced, with gentle longitudinal traction and external rotation. The important basic orthopedic principle of evaluating adjacent bones and joints in an injured limb cannot be over-emphasized. Three of the nine previously reported cases initially missed the shoulder dislocation.^{1,2,6} In all three, the patients presented with more pain, swelling and deformity at the elbow than at the shoulder. This probably overshadowed the less symptomatic shoulder dislocation and contributed to the delay in diagnosis. In addition, two of these three patients were overweight.^{1,2} Both authors warned that obesity could contribute to a delay in diagnosing the shoulder dislocation, by minimizing the typical abnormalities in shoulder contour. Evaluation of an upper extremity with an obvious elbow dislocation should always include clinical and radiographic examination of the proximal and distal bones and joints. A

Fig. 5 – a. Antero-posterior view; left shoulder following reduction and internal fixation. b. Lateral view; left shoulder following reduction and internal fixation.

Fig. 6 – Lateral view; implant removal left elbow.

mechanism of injury involving high energy warrants an increased index of suspicion for combined ipsilateral shoulder and elbow dislocations. Closed reduction of the elbow followed by the shoulder usually provides successful treatment.

4. Conclusion

Even when combined with a fracture at one or both locations, closed reduction of ipsilateral shoulder and elbow dislocations, in conjunction with appropriate fracture management, can result in a positive functional outcome.

Fig. 7 – Y-view lateral; implant removal shoulder.

Table 1 – Reported cases of ipsilateral dislocations of the shoulder and elbow in the literature.

Author	Year	Age/sex	Mode of injury	Side	Dislocation type shoulder	Dislocation type elbow	Associated injury	Management
Suman ⁹	1981	31/male	Driver/car accident	Left	Anterior	Posterior	None	Both joints reduced closed. Order not specified.
Rosson ⁸	1987	49/male	Fell down stairs	Right	Anterior	Posterior	Posterior dislocation wrist	All joints reduced closed. Order not specified.
Ali et al ²	1998	33/female	Fell down stairs	Left	Anterior	Posterior	Radial head fracture	Both joints reduced closed. Order not specified.
Khan and Mirdad ⁶	2001	35/male	Driver/car accident	Left	Anterior	Posterior	Greater tuberosity fracture	Both joints reduced closed. Elbow first.
Essoh et al ³	2005	31/male	Fell down stairs	Right	Anterior	Posterior	None	Both joints reduced closed. Elbow first.
Kerimoglu et al ⁵	2006	50/female	Pedestrian/car accident	Left	Anterior	Posterior	1 Greater tuberosity fracture 2 Contralateral humeral shaft fracture	Both joints reduced closed. Shoulder first. Unstable elbow pinned following reduction.
Inan et al ⁴	2008	27/male	Conveyor belt	Right	Anterior	Posterior	1 Greater tuberosity fracture 2 Grade II humeral shaft fracture	Open ipsilateral humeral shaft fracture debrided. Both joints reduced closed. Shoulder first.
Ahmet et al ¹	2011	48/female	Fell down stairs	Right	Anterior	Postero-lateral	Greater tuberosity fracture	Both joints reduced closed. Elbow first.
Meena et al ⁷	2012	30/male	Driver/car accident	Right	Anterior	Posterior	None	Both joints reduced closed. Elbow first.
Current case	2013	26/male	Pedestrian/bus accident	Left	Posterior	Anterior	1 Humeral head fracture 2 Scapular spine/acromion fracture 3 Grade IIIA fracture olecranon/coronoid/trochlea	Open elbow fracture debrided. Both joints reduced closed. Elbow first. Fracture treatment; see Case report

Conflicts of interest

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

REFERENCES

1. Ahmet I, Mert K, Mustafa I, et al. Ipsilateral simultaneous shoulder and elbow dislocation: a case report. *Turk J Emerg Med.* 2011;11:72–75.
2. Ali FM, Krishnan S, Farhan MJ. A case of ipsilateral shoulder and elbow dislocation: an easily missed injury. *J Accid Emerg Med.* 1998;15:198.
3. Essoh JBS, Kodo M, Traoré A, et al. Ipsilateral dislocation of the shoulder and elbow: a case report. *Niger J Surg Res.* 2005;7:319–320.
4. Inan U, Cevik AA, Omeroglu H. Open humerus shaft fracture with ipsilateral anterior shoulder fracture-dislocation and posterior elbow dislocation: a case report. *J Trauma.* 2008;64:1383–1386.
5. Kerimoglu S, Turgutoglu O, Ayanci O, et al. Ipsilateral dislocation of the shoulder and elbow joints with contralateral comminuted humeral fracture. *Saudi Med J.* 2006;27:1908–1911.
6. Khan MR, Mirdad TM. Ipsilateral dislocation of the shoulder and elbow. *Saudi Med J.* 2001;22:1019–1021.
7. Meena S, Saini P, Rustagi G, Sharma G. Ipsilateral shoulder and elbow dislocation: a case report. *Malays Orthop J.* 2012;6:43–46.
8. Rosson JW. Triple dislocation of the upper limb. *J R Coll Surg Edinb.* 1987;32:122.
9. Suman RK. Simultaneous dislocations of the shoulder and the elbow. *Injury.* 1981;12:438.