

Bilateral Anterior Shoulder Dislocation

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Introduction: Unilateral anterior shoulder dislocation is one of the most common problems encountered in orthopedic practice. However, simultaneous bilateral anterior dislocation of the shoulders is quite rare.

Case Presentation: We report a case of a 75-year-old woman presented with simultaneous bilateral anterior shoulder dislocation following a trauma, complicated with a traction injury to the posterior cord of the brachial plexus.

Conclusions: Bilateral anterior shoulder dislocation is very rare. The excessive traction force during closed reduction may lead to nerve palsy. Clear documentation of neurovascular status and adequate imaging before and after a reduction should be performed.

Keywords: Shoulder; Dislocation; Brachial Plexus

1. Introduction

Anterior shoulder dislocation is one of the most common problems encountered in daily orthopedic practice and needed to be treated promptly. Bilateral anterior shoulder dislocation is a very rare occurrence and can be easily missed if the patients are not carefully examined. The adequate imaging and detailed examination of the neurovascular system are also required to rule out any fracture and neurovascular injury. The following case report described a case of simultaneous bilateral anterior shoulder dislocation after injury, complicated with traction injury to the posterior cord of brachial plexus.

2. Case Presentation

A 75-year-old woman with a history of good past health presented to the emergency department complaining of pain in both shoulders. She lost her balance and fell forward while she was doing the bench push-up at the park. She hit on bench with both shoulders in extension, abduction and external rotation position. She noted severe bilateral shoulder pain afterward. Physical examination revealed forehead hematoma and the squaring of bilateral shoulders was also noted. Both shoulders were irritable with a restricted range of movement in all aspects. Diagnosis of bilateral anterior shoulder dislocation without associated fracture was confirmed by imaging (Figure 1). Closed reduction was performed in the emergency department under sedation, successful reduction of both shoulders was also confirmed with imaging (Figure 2) and then the patient was admitted to our department. The patient complained of the recurrent

right shoulder pain after admission. On examination, the recurrent right shoulder anterior dislocation was suspected and confirmed with imaging. Closed reduction was performed using the Kocher's technique under fluoroscopy. Left wrist drop was also noticed (Figure 3). On detailed examination, numbness along the posterior aspect of forearm, weak triceps action and complete loss of left wrist finger extension were noted. A traction injury to the posterior cord was suspected. The nerve conduction test (NCT) and magnetic resonance imaging (MRI) showed the left brachial plexus injury together with bilateral shoulder dislocation. Both shoulders were immobilized with a shoulder immobilizer and a dynamic wrist splint was applied to the deformed wrist joint. The NCT was performed four months post-injury and the mild motor abnormality of left radial nerve was noted. MRI scans of bilateral shoulders and bilateral brachial plexus were performed six months post-injury. It showed Hill Sachs defect of the right humeral head and focal full thickness tear of the right supraspinatus tendon (Figure 4). There was also a complete rupture of the left supraspinatus tendon with proximal retraction of 3.5 cm (Figure 5). No significant finding was noted in the brachial plexus except perineural cysts over C8 and T1 nerve root. The patient was referred to physiotherapy and occupational therapy for rehabilitation. The shoulder immobilizers were kept for six weeks and the active-assisted mobilization was then started. Electrical stimulation of the affected muscle was performed to prevent muscle atrophy. At follow-up, 6 weeks post-injury, the patient reported an improvement in bilateral shoulder pain and no recurrent shoulder

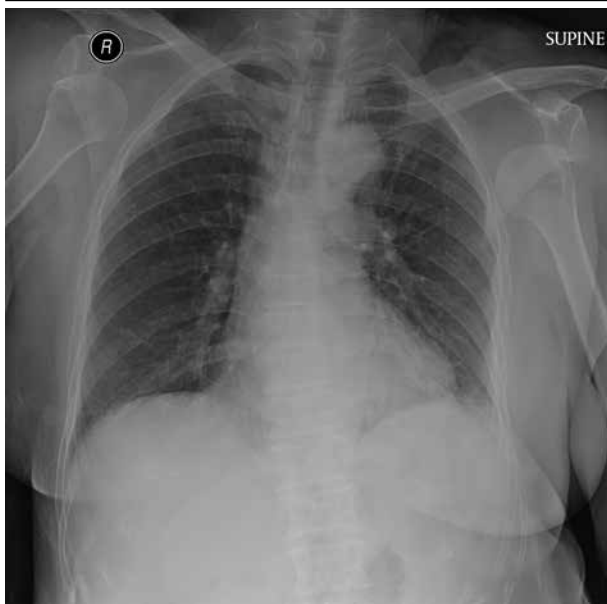


Figure 1. Injury Film Showed Bilateral Shoulder Dislocation



Figure 2. Post Closed Reduction Radiographs of Both Shoulders



Figure 3. Left Wrist Drop



Figure 4. MRI Right Shoulder Showed Hill-Sachs Defect of the Humeral Head and Focal Full Thickness Tear of the Supraspinatus Tendon

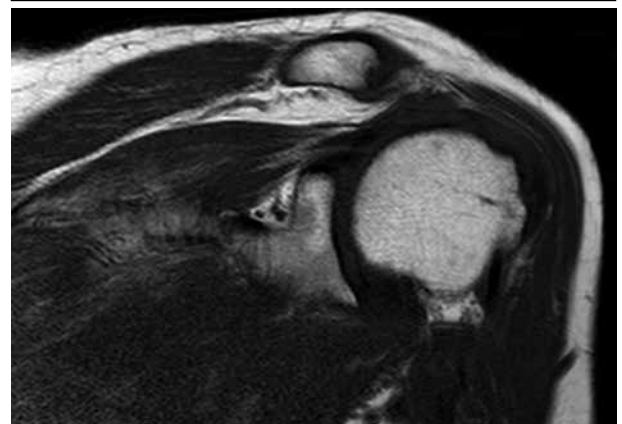


Figure 5. MRI Left Shoulder Showed a Complete Rupture of the Supraspinatus Tendon With Proximal Tendinous Retraction

dislocation. There was also an improvement in the numbness of the left upper limb and the power of left wrist and finger extension (both reached grade 4/5). At follow-up, 4 months post-injury, the patient was able to flex both shoulders to 145 degrees and abduct them to 160 degrees.

3. Discussion

Simultaneous bilateral anterior shoulder dislocation is a rare condition. Bilateral shoulder dislocation was first described in 1902 in patient with the excessive muscular contractions due to Camphor overdose (1). Most of them are case report or small series in the literature (2-28) (Table 1). In contrast, bilateral posterior shoulder dislocation occurs more frequently, and is usually due to electrical shock, seizures or other reasons, which lead to vigorous involuntary muscle contraction (3). Bilateral anterior shoulder dislocation occurs mainly due to trauma to the shoulders in the extension, abduction and external rotation positions (2, 20, 25), which is exactly the same injury mechanism as our reported case. Other mechanism of injury is the traction in forward flexion of the shoulder (2, 24, 25, 28). Many of the reported cases are sport-related injuries including weight-lifting training (4, 6, 20), backstroke swimming (8), chin-up exercise (24) and horse riding (2). The injury can be trivial, especially in elderly as in this case (9). Besides traumatic causes, bilateral anterior shoulder dislocation can follow hypoglycemic convulsion (11) or epileptic seizure (14, 17, 21). The posterior dislocations are more common after seizure since the contraction of the relatively weak external rotators and the posterior fibers of the deltoid are overcome by the more powerful internal rotator. The succeeding adduction and internal rotation usually causes the humeral head to dislocate posteriorly (21). Bilateral anterior dislocation following a seizure may be from the trauma of the shoulders striking the floor after the collapse rather than due to the muscle contractions (21). Loss of consciousness after the seizure will not allow the patient to react and reflexly protect one of his arms by exposing the other (21).

Clinical findings of an anterior dislocation shoulder in-

clude squaring of the shoulder and a positive Dugas test (the hand of the affected shoulder cannot reach the contralateral shoulder) (18). Asymmetry of the joint typically heralds a dislocation. When bilateral dislocation occurs, this clinical asymmetry is absent and leading to missing diagnosis (27). The bilateral anterior shoulder dislocation can be associated with fracture of the coracoid process or greater tuberosity (13, 19, 21, 26, 28). MRI in the acute phase plays a key role in the diagnosis of non-displaced fractures, as well as labral tears and Hill-Sachs lesions. Awareness of the associated injury is important in order to better approach treatment options, avoiding coracoid nonunion and chronic glenohumeral instability (19).

Most of the injuries have been treated by closed reduction and various period of immobilization with good clinical outcomes. The Spaso technique has been recommended (18, 23). The dislocated arm is grasped around the wrist and while maintaining vertical traction, the shoulder is slightly rotated externally (18, 23). It facilitated reduction as the amount of force used in this method is less compared with the Kochers method, the pain experienced by the patient is also less. The severe muscle spasm resulting from pain, which might prevent reduction by the Kochers method, can be avoided (18).

The brachial plexus injury after anterior shoulder dislocation is also a rare complication (9, 15). The mechanism of injury is mainly a traction injury to the brachial plexus (9). When the humeral head was dislocated, the nerves are stretched and are under great tension (29). In our case, the flexed position of the elbows with traction of the shoulder during the closed reduction caused a great tension over posterior cord resulting in a posterior cord

traction injury and consequently the patient presented with forearm numbness and wrist drop. The MRI/NCT could be considered to confirm the diagnosis.

Patient suffered from this kind of brachial plexus palsy are initially treated conservatively. Regular interval examination to look for any clinical recovery is recommended. For those patients who do not show any sign of recovery at 3-6 months after the injury may need to consider for surgical exploration (30). Surgery is recommended to perform three weeks to six months after injury. Secondary suture or even nerve grafting may be needed, which depends on the length of the nerve gapping and surrounding soft tissue condition (31).

One special point for this case was that patient actually could not clearly remember when exactly the neurological symptoms appeared. And it was also not clearly documented about the neurological status in the case notes of the emergency department. Patient noted some left upper limb weakness and numbness initially after the injury and then suffered from the complete left wrist drop and finger drop after the second closed reduction of left shoulder using the Kocher's method. Therefore, the excessive force used in reduction may be one of the contributing factors for the injury of the posterior cord of the brachial plexus in this case. In Kocher's method, traction force was applied on the arm and it was abducted. Then the arm was externally rotated, adducted and then internally rotated. The excessive traction force, which was applied may lead to nerve palsy and even proximal humeral fracture (32). Therefore, clear documentation of neurovascular status and adequate imaging before and after a reduction should be performed.

Table 1. Summary of Reports of Bilateral Anterior Shoulder Dislocation ^a

Case Report	Gender/Age, y	Chronicity	Etiology	Associated Injury	Treatment
Mehta and Kottamasu (14)	M/53	acute	T	nil	CR, I, physio
Maffulli and Mikhail (4)	M/31	acute	T	nil	not available
Marty et al. (13)	Not reported	acute	IMC	nil	ORIF
Cresswell and Smith (19)	M/31	acute	T	nil	CR, I x 6 weeks, physio
Dinopoulos et al. (27)	F/76	acute	T	3 part fracture of right proximal humerus	CR, I (left side x 1 week, right side x 3 weeks), physio
Cottias et al. (12)	M/33	acute	IMC	bilateral fractures of the greater tuberosity and tip of the coracoid process	CR left shoulder + ORIF right shoulder
Esenkaya et al. (6)	M/22	acute	T	nil	Not available
Yuen and Tung (22)	M/41	acute	IMC	nil	CR
Dunlop (3)	F/91	acute	T	nil	CR, I x 1 week
Singh and Kumar (17)	M/21	acute	T	nil	CR, I x 3 weeks
Devalia and Peter (28)	M/43	acute	T	right greater tuberosity fracture	CR, I x 4 weeks
Ngim et al. (10)	F/65	acute	T	nil	CR, I x 3 weeks
Ozcelik et al. (11)	M/20	acute	IMC	greater tuberosity fracture	CR, I x 6 weeks
Bellazzini and Deming (21)	M/32	acute	Non-T	nil	CR
Turhan and Demirel (2)	M/46	acute	T	nil	CR, I x 6 weeks, physio
Lasanianos and Mouzopoulos (20)	M/25	chronic	IMC	greater tuberosity fracture	CR, IF of left greater tuberosity fracture, I x 2 weeks, physio
Felderman et al. (23)	F/44	acute	T	nil	CR, I, physio
Kalkan et al. (9)	F/64	acute	T	left brachial plexus injury	CR, I x 3 weeks, physio
Kalkan et al. (9)	F/65	acute	T	nil	CR, I x 3 weeks, physio
Abdulkadir et al. (8)	M/35	chronic	IMC	bilateral brachial plexus injury	patient refused operation

Tripathy et al. (5)	not reported	acute	T	nil	CR, I
Tripathy et al. (5)	not reported	acute	IMC	nil	CR, I
Dlimi et al. (15)	M/20	acute	T	nil	CR, I x 3 weeks, physio
Mofidi et al. (16)	M/30	acute	IMC	mandible fracture	CR
Moughty and O'Connor (26)	M/34	acute	T	nil	CR
Nourredine et al. (7)	M/70	acute	T	nil	CR, I x 4 weeks, physio
Taneja et al. (18)	M /37	acute	IMC	nil	CR, I x 2 weeks, physio
Meena et al. (25)	M/24	acute	T	left greater tuberosity fracture	CR, I (right side x 1 week, left side x 6 weeks)
Ballesteros et al. (24)	F/74	acute	T	nil	CR, I x 3 weeks, physio
Ballesteros et al. (24)	M/17	acute	T	nil	CR, I x 2 weeks, physio

^a Abbreviations: T, traumatic; IMC, involuntary muscle contraction; CR, closed reduction; OR, open reduction; IF, internal fixation; I, immobilization.

Authors' Contributions

Dr Yuk Chuen Siu prepared the manuscript and performed the literature review; Dr Tun Hing Lui collected the clinical data and supervised the work of Dr Yuk Chuen Siu.

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