Case Report

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Bilateral Anterior Shoulder Dislocation with Associated Bilateral Greater Tuberosity Fractures: Presentation of Two Consecutive Cases and Literature Review

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ABSTRACT

The shoulder is the most frequently dislocated joint in the body. Most of the dislocations are anterior. However, bilateral dislocations which are usually posterior are rare and result from epileptic seizures, electric shock, electro convulsive therapy and sport injuries. Sequential anterior dislocations are extremely rare and only three cases have been reported in the literature. Treatment is mainly conservative with few indications for operative intervention. We present a 16 year boy with sequential bilateral anterior dislocation, the youngest ever with this category of injury and a 65 year old man with bilateral anterior shoulder dislocation. These case reports aim to highlight the need for high index of suspicion in order not to miss the injury.

Keywords: Anterior, Bilateral , Dislocation ,Sequential, Seizures, Shoulder.

INTRODUCTION

Although the shoulder is the most frequently dislocated joint encountered in clinical practice, bilateral shoulder dislocation is rare and is usually posterior.[1] The architecture and dynamics of glenohumeral articulation allows remarkable flexibility at the cost of intrinsic stability of the joint.[2] The Stanmore Instability Classification System which was developed in London in 2004 identifies two broad reasons why shoulders become unstable. Firstly, structural changes resulting from major trauma such as acute dislocation or repetitive micro-trauma. Secondly, unbalanced muscle recruitment leading to displacement of the humeral head from the glenoid socket. From a clinical and therapeutic stand point, 3 polar types of disorder were identified: Type I represents traumatic structural instability. Type II represents atraumatic (or minimally traumatic) structural instability while Type III is atraumatic non-structural instability (muscular

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dyskinesia).[3] Type 1 injury is the commonest type of instability, occurring in more than 95 per cent of cases. This usually follows an acute trauma in which the arm is forced into abduction, external rotation and extension leading to anterior dislocation.[2,3] When the dislocation becomes recurrent , the labrum and capsule are often avulsed from the anterior rim of the glenoid (the Bankart lesion). Sometimes, there may be an indentation on the posterolateral aspect of the humeral head (the HillSachs lesion) which is a compression fracture due to the humeral head being forced against the anterior glenoid rim each time it dislocates. [1,3].

Shoulder dislocations usually results from sport injury, electric shock, epileptic seizures, electroconvulsive therapy and emerging causes like cocaine-induced seizures.[4-11] Traumatic anterior shoulder dislocations usually occur as isolated injuries. However, sequential bilateral anterior dislocation is extremely rare and only two cases have been reported in the literature. [4,5] Associated complications include bony lesions, nerve injury , vascular and rotator cuff tears . A thorough clinical examination and radiological investigation including radiographs, Computerized Tomographic scan and Magnetic Resonance Imaging (MRI) may be required for diagnosis. There is an increased risk of unstable reduction if the shoulder is not treated within 24 hours after an initial injury.[6] The treatment of shoulder dislocation is usually conservative. Kocher's manouvre and Hippocratic method are some of the commonest techniques employed by many surgeons to achieve closed reduction. When conservative treatment fails, open or arthroscopic surgery can be done. Open Bankart, arthroscopic Bankart, and Latarjet procedures are some of the operations that can be utilized to achieve shoulder stability.[6,7] We present a 16 year old male with sequential bilateral anterior dislocation, the youngest patient ever with this category of injury and also a 65 year old man with bilateral anterior dislocation. These cases highlight the need for high index of suspicion so that an early diagnosis can be achieved.

CASE PRESENTATION

Case - 1

N.E is a 16 year old student who was brought into our hospital with a past history of good health until one week prior to presentation . He slept overnight on the upper bed of a double bunk bed in his school hostel but fell from there and was found unconscious on the floor the next morning by his classmates. He was taken home to his family in a state of delirium (postictal sleep) with associated pain, swelling and deformity in the left shoulder. He was taken to traditional bone setters for treatment but to no avail. He was returned back to school after one week with the unreduced left shoulder. However, he had a second episode of seizure with jerking of both upper limbs. When he regained consciousness, he noticed that he also had right shoulder pain with associated deformity and difficulty in using the right upper limb necessitating presentation in our facility.

Physical examination revealed a bruise on the right side of his fore head with bilateral squaring of the shoulders (epaulet sign). Sulcus sign was also positive in both shoulders. There were associated palpable globular fullness below the coracoid processes due to the dislocated humeral heads. Both shoulders were in fixed abduction, external rotation and extension (Figure 1). Dugas test was positive in both shoulders (inability to put the hand of the injured limb on the contralateral shoulder).Both shoulders were irritable and range of movement was restricted in all directions. There was no sensory, motor or vascular deficit in both upper limbs. No evidence of ligamentous laxity was observed. The vital signs were normal. The cardiovascular and respiratory system examinations were within normal limits.

Plain radiographs confirmed bilateral anterior glenohumeral dislocation with associated bilateral greater tuberosity fractures (Neer's Type 1)(Figure 2). Computerized Tomographic scan and MRI were not done because of financial constraints .

Both shoulders were reduced at the same sitting under general anaesthesia with good muscle relaxation using

Figure 1. The clinical appearance of the first patient with bilateral anterior shoulder dislocation.

Hippocratic method. With the patient lying on the floor ,the upper limb was flexed at the elbow and progressive longitudinal traction was applied to the slightly

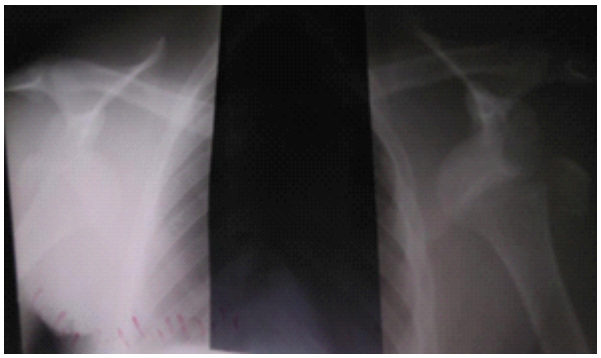

Figure 2. The radiograph of first case of bilateral anterior shoulder dislocation with bilateral greater tuberosity fractures.

abducted arm .Counter traction was achieved by the heel of the surgeon in the axilla in addition to an assistant who was pulling through a towel in the axilla in an upward and outward direction. This was followed by external rotation and adduction of the arm until a clunk was heard signifying reduction. Reduction was achieved after a single attempt but the left shoulder dislocation being older was more difficult than the right shoulder. Post reduction radiographs showed reduced concentric glenohumeral joints as well as reduced bilateral greater tuberosity fractures (Figure 3).

Both shoulders were immobilized with arm slings for three weeks after which gradual pendulum range of motion exercises were commenced until full recovery after 6weeks (Figure 4).He was also treated for enteric fever in the course of the admission and placed on anticonvulsants by a physician .The Patient gained full range of painless movement of both shoulders at 8 weeks and had no further episodes of seizures. He was followed up for one year with no complications of shoulder

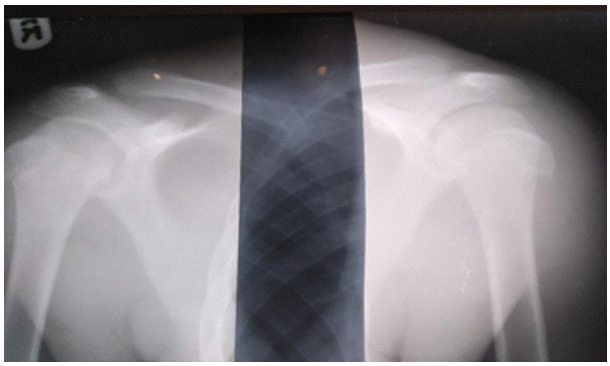

Figure3. The radiograph of concentric reduction of the first case of bilateral shoulder dislocation.

dislocation.

Case - 2

Our second case U.T is a 65 year old retiree who presented to us with complaints of pains in both shoulders and difficulty in using both upper limbs of twelve days duration.

He was on admission in a private hospital when he started convulsing and fell on his back sustaining a closed injury to both shoulders with associated pains ,swelling , deformity and difficulty in using both upper limbs. There was also a history of associated weakness of both upper limbs. There was no loss of consciousness and no injuries to any other part of his body. He had no previous shoulder injury.

He is a known hypertensive and has been diagnosed to

Figure 4. Normal shoulders 10 weeks after closed reduction of first case of bilateral shoulder dislocation.

have Type II Diabetes Mellitus for ten years. He has on treatment for both conditions with Losartan, metformin and clopidogrel .Review of other systems were not contributory. On general examination , he was an elderly man , afebrile , anicteric ,not pale and had no pedal oedema.

Musculoskeletal system examination revealed bilateral flattening of the deltoid regions and bilateral fullness of the subcoracoid region with tenderness. There was bilateral squaring of the shoulders with positive epaulet's sign. There was also limited internal rotation and adduction of both shoulders and a diminished sensation at the regimental badge area bilaterally. He was haemodynamically stable.

Radiographic examination showed dislocation of both humeral heads into the subcoracoid space with fractures of both greater tuberosities .(Figure 5). Echocardiograph showed ejection fraction of 70%. Electrocardigraph revealed sinus rhythm with occasional ventricular premature complexes.

Serum urea and electrolytes showed Sodium= 141 mmol/L , Potassium =3.9 mmol/L , Chloride =112mmol /L , Bicarbonate= 19mm/L , Urea =7.9mmol/L and Creatinine =108µmol/L.

Full Blood Count was essentially normal with a Packed cell volume of 34%.Fasting Lipid profile showed a Total cholesterol =1.6mmol/L , Triglyceride =1.9mmol/L, High density lipoprotein=0.3 mmol/L and Low density lipoprotein =0.7 mmol/L Viral serology revealed non-reactive retroviral screen test, negative Hepatitis B surface antigen and a negative Anti-HCV.

A diagnosis of Bilateral anterior shoulder fracture dislocation Neer's Type 1 was made. The patient had bilateral closed reduction using the Hippocratic method under general anaesthesia with good muscle relaxation. Post operatively the reduced shoulders joints were immobilized with velpaux bandage for three weeks. A post reduction radiograph done after six weeks showed

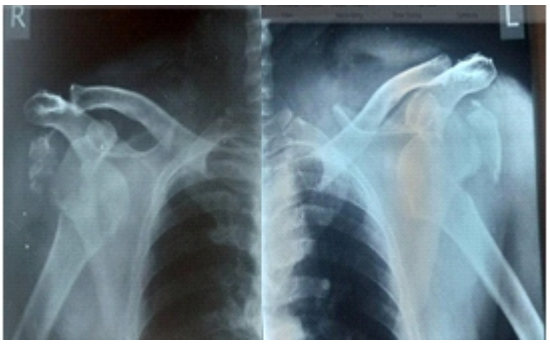

Figure 5. Bilateral anterior shoulder dislocation and greater tuberosity fracture in the second case

congruent shoulder joints with reduced greater tuberosities (Figure 6).

However ,the patient still complains of weakness in both upper limbs with limited range of motion of the shoulders as follows: abduction=20 degrees , extension =20 degrees , flexion 30 degrees , and adduction= 15 degrees in both shoulders.

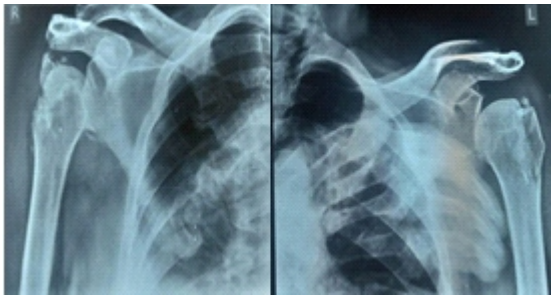

Figure 6. Concentric reduction of bilateral anterior shoulder dislocation with associated greater trochanter fractures in the second patient.

DISCUSSION

Literature search shows that unlike unilateral shoulder dislocation which is fairly common , simultaneous bilateral shoulder dislocation following excessive muscular contraction was first documented in 1902 after an overdose of camphor.[8] Twenty eight cases were reported between 1966 and 1999 by Dinopoulos *et al*. [9-15] While Dunlop reported 44 cases in 2002. [8]

However, cases of sequential anterior dislocation in which one shoulder dislocates after the other have been documented in the literature but they are very rare. Three cases of sequential anterior dislocation have been reported to date with our first case presentation being the fourth.[6,7,16] It is the first to be reported in the black population. He is also the youngest of all reported cases of bilateral anterior shoulder dislocations in the last five decades. [17]

Typically, anterior dislocation results from a fall on the hand leading to the driving forward of the humeral head. This leads to the tearing of the capsule and avulsion of the glenoid labrum (the Bankart Lesion). Occasionally, the posterolateral part of the head is crushed (Hill Sach's lesion).[17-20] Seizures are known to produce anterior dislocation by extension, external rotation and abduction of the shoulder joint either by indirect or direct trauma as seen in second case. [19] Our first case might have fallen backwards with his arm extended behind his back on each occasion creating the mechanism for anterior dislocation during the seizures.[20]

Bilateral posterior shoulder dislocation results commonly from seizures, electroconvulsive therapy, electric shock and hypoglycaemic episodes. This occurs due to excessive involuntary muscular contractions of the internal rotators overpowering the weaker external rotators.[17] Eventually, the overwhelming forces of adduction and internal rotation on the shoulder are sufficient to dislocate the head of the humerus posteriorly.[7,20,21] Unlike posterior dislocation, anterior dislocation usually occurs after a traumatic incident. Fractures of the greater tuberosity may be associated with anterior dislocations in 10%.[20] In such situations, the humeral head may be located in the subcoracoid, subglenoid or subclavicular positions.[18,21,22] Both cases presented had their humeral heads in the subcoracoid space. This has implications on the choice of manoeuver to be used. [22] This manoeuver is usually not performed by the traditional bone setters due to lack of training. This may account for some cases of delay in presentation to the orthodox hospitals. The greater tuberosity in isolation or in association with neurovascular injury is also reported to be displaced is 15% of cases. [20,21,22] This was also observed in both cases. Rotator cuff tear and neurovascular injuries can best be diagnosed with magnetic resonance imaging. It was not done in these cases because of financial constraints.

The treatment for bilateral shoulder dislocation is usually conservative.[23] Closed reduction and immobilization with arm sling for 3 weeks is usually adequate.[24] Early pendulum range of motion exercises are recommended after two weeks.[17] If the greater tuberosity fracture fragment is not

well reduced , it can lead to functional impairment is was seen in the second case.[20,22] This first case was who is younger had a better reduction and full functional activity was achieved at 8 weeks.

Bilateral shoulder and upper limbs immobilization poses a challenge to the patient in terms of daily routines including feeding and personal hygiene.[18] Some authors have recommended earlier commencement of rehabilitation in the less painful shoulder.[8] Others have suggested earlier rehabilitation of both shoulders if the patient is elderly since they are prone to shoulder

stiffness. Chronic (more than 3 weeks), old unreduced dislocations (more than 6 weeks) and failed closed reduction may be indications for open reduction. However, operative reduction is rarely utilized because of the associated poor outcome due to neurovascular injuries from soft tissue contracture. There is also the risk of pathological fractures from osteoporosis especially among the elderly.[24] Masterly inactivity strategy is adopted in elderly patients with neglected shoulder dislocations.

CONCLUSION

The outcome of conservative treatment of bilateral shoulder dislocation is similar to unilateral shoulder dislocation. Meticulous examination is necessary for early diagnosis and treatment of this rare injury as well as the underlying predisposing seizure disorder.

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Conflicts of interest

There is no conflict of interest to declare

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