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Case Report

Bilateral luxatio erecta with greater tuberosity fracture: a case report

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ABSTRACT

Bilateral shoulder dislocation with greater tuberosity fracture and luxatio erecta, both are rare by themselves, with only few reports of each. We report an unusual case of post-traumatic bilateral symmetrical shoulder dislocation involving luxatio erecta with greater tuberosity fracture in a young male. To our knowledge, this is the first case of symmetrical bilateral shoulder dislocation with greater tuberosity fracture involving luxatio erecta dislocation from Indian subcontinent.

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1. Introduction

The shoulder is the most unstable joint in the body to get dislocated and it usually occurs anteriorly. Bilateral glenohumeral dislocations are uncommon and almost always posterior,^{1–3} with only about 30 cases of bilateral anterior shoulder dislocation published in the literature.^{2,4–6} These dislocations are usually caused by electric shock, electroconvulsive therapy, grand mal seizures and convulsions, following episodes of hypoglycemia and incidents of dyskinesia.^{4,7} Bilateral fracture dislocations are even rarer with only few cases reported. Luxatio erecta is least common form of shoulder dislocation and characterized by hyperabduction of the affected arm, flexion of the elbow and pronation of the forearm and usually associated neurovascular complications. Bilateral luxatio erecta is extremely rare conditions with only few cases have been reported in international literature.^{8,9} Furthermore bilateral

symmetrical fracture dislocation involving luxatio erecta has not been reported from Indian subcontinent till yet.

In this article we describe a rare case of bilateral luxatio erecta with greater tuberosity fractures, who was successfully treated conservatively by closed reduction with satisfactory result.

2. Case report

A 19-year-old male was travelling on door step of moving train holding the gate bar with left hand, when he slipped and fell down on his right elbow with valgus thrust. Missing of door step while holding the gate bar with left hand resulted hyperabduction injury of left shoulder levering proximal shaft of humerus over the acromion, thereafter fall from running train, on flexed right elbow with shoulder abduction created a

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sudden valgus thrust leading to levering out of humeral head inferiorly. He presented to the emergency department with complaints of pain and immobility in both shoulder. He also sustained injury to his forehead and nose. His both arms were hyperabducted and fixed above his shoulder, elbows were flexed and both forearms were pronated (Fig. 1). The passive movements at both shoulders were painfully restricted. The neurovascular structures were intact bilaterally. There was no history of loss of consciousness, seizure, alcohol intake, previous shoulder dislocation, abdominal pain and breathlessness. His Glasgow coma scale was 15/15.

The radiograph confirmed an inferior dislocation with greater tuberosity fracture on right (Fig. 2A) and left side (Fig. 2B). CT head was normal.

Closed reduction was performed in both shoulders by traction-countertraction method under general anaesthesia and confirmed by radiograph which showed anatomical reduction of glenohumeral joint and greater tuberosity fracture bilaterally (Fig. 3A and B).

3. Reduction technique

After administration of general anaesthesia, the patient laid supine on locked stretcher. Surgeon applies axial traction on the abducted humerus while assistant applies counter-traction using sheet wrapped around the patient's upper torso, such that the force is directly opposite to the traction vector. Now arm is brought gradually in less abduction and finally placed at patient's side. The procedure is repeated on other side as well.

The neurovascular status was intact post-reduction. The shoulder was immobilized in adduction and intrarotation for 4 weeks (Fig. 4). The patient was advised physical therapy after 4 weeks. At 4 weeks, pendulum exercises of both shoulders were started to increase the range of motion. At 6 weeks shoulder strengthening exercises were started. The patient was able to resume his daily activities at 3 months. At 12 months follow up, the outcome was satisfactory and shoulders were stable and painless with good strength and range of motion both side. The shoulder movements were limited terminally on right side while were near normal on left side (Fig. 5A–C), constant shoulder scores¹⁰ were 82 on right side

Fig. 1 – Typical attitude of patient with hyperabduction at both shoulder, flexion at elbow and pronation of forearm.

Fig. 2 – AP radiograph of right (A) and left (B) shoulder showing luxatio erecta with greater tuberosity fracture.

and 90 on left side respectively. The radiograph showed proper consolidation of greater tuberosity fractures bilaterally (Fig. 6). The patient gave written informed consent prior to include into the study and the study was approved by an institutional review board.

4. Discussion

The muscular, ligamentous, and bony anatomy of the shoulder (glenohumeral joint) allows, the most extensive range of motion than any other joint in the human body. This anatomy also makes the glenohumeral joint the most vulnerable to get dislocated.

Most glenohumeral dislocations (90–95%) occur anteriorly, as the muscular and ligamentous support is least robust anterior to the humeral head. Posterior dislocations occur far less commonly because of the significant muscular and bony support afforded by the rotator cuff and scapula.

Inferior glenohumeral dislocations, also known as luxatio erecta, are extremely uncommon, accounting for 0.5% of all shoulder dislocations.^{8,11} The first report of luxatio erecta was made Middeldorpf and Scharm in 1859, bilateral luxatio erecta is exceptional and till now only about 17 cases has been reported. The first report on bilateral occurrence was made by Murard in 1920.¹² Most inferior dislocations result from forceful hyperabduction of the shoulder. Hyperabduction of the glenohumeral joint initially results in impingement of the humeral neck against the acromion. The leverage caused by this impingement in the setting of forceful hyperabduction

Fig. 3 – (A & B): Post reduction AP radiograph of Right & Left shoulder showing satisfactory reduction of glenohumeral joint and greater tubercle.

ultimately drives the humeral head downward, causing it to disrupt the inferior portion of the glenohumeral capsule and dislocate.¹³ Forceful, direct axial loading of an abducted shoulder can also result in luxatio erecta.

In our case, both shoulders dislocated as a result of indirect mechanism. Missing of door step would have caused hyper-abduction injury at left shoulder levering proximal shaft of humerus over the acromion and out of glenoid while fall from running train, on flexed right elbow with shoulder abduction created a sudden valgus thrust leading to levering out of humeral head inferiorly. This is supported by the review of literature that states, “bone injuries are indeed more common in dislocations caused by indirect mechanism”.^{14,15}

The clinical presentation of inferior dislocation of shoulder joint is characteristic with the arm in abducted position, elbow flexed, forearm pronated and hand resting over the head. The passive motion at the shoulder is limited because of intense pain. The humeral head is palpable in the region of axilla.^{9,16–18} Our patient had similar presentation bilaterally as described.

Radiographic examination is required for confirmation of diagnosis and ruling out the possible fracture. The AP view

Fig. 4 – Post reduction immobilization of both shoulders in chest arm strapping.

shows axis of humerus is directed upwards and aligned parallel to scapular spine. The humeral head is positioned inferior to glenoid cavity and faces inferiorly. There may be associated greater tuberosity fracture or concomitant acromioclavicular dislocation. In our patient, in addition to the inferior dislocation of both glenohumeral joint, fracture of greater tuberosity of the both humerus were observed which is extremely uncommon.

Many injuries have been reported in association with luxatio erecta. Fractures and Lesions of rotator cuff have been reported in approximately 80% of cases, neurological manifestation in 60% and vascular lesions in 3% cases.^{19–21} Among the neurological complications, main concern is axillary nerve but the damage of the whole brachial plexus or the three great nerves of the upper limb cannot be excluded. The prognosis of the neurological lesion is considered to be excellent within 2 weeks to 1 year. The vascular complications include axillary artery injury and axillary venous thrombosis. Garcia et al described a case of bilateral luxatio erecta complicated by an axillary vein thrombosis.¹¹ In our patient bilateral greater tuberosity fractures were present but neurovascular structures were intact. Although greater tuberosity fracture has been reported frequently with luxatio erecta, there is only one international report on symmetrical bilateral luxatio erecta with greater tuberosity fracture.²²

The prognosis of this injury is generally favourable although significant morbidity due to adhesive capsulitis or joint instability may occur. Recurrent inferior dislocation is very uncommon.

Fig. 5 – (A): showing terminal limitation of lateral elevation on right side. (B): showing terminal limitation of external rotation on right side. (C): showing good range of internal rotation both side.

The treatment generally consists of closed reduction of under appropriate anaesthesia and relaxation. The reduction techniques generally used are traction-countertraction and two step technique. Traction counter-traction technique

Fig. 6 – One year follow up X-ray of both shoulder showing consolidation of greater tuberosity fracture with satisfactory reduction on both side.

involves axial traction, which is applied in line with the humerus followed by gradual decrease in shoulder abduction. Two-step technique involves conversion of the humeral head from inferior dislocation to an anterior dislocation in first step then reducing the humeral head into the glenoid in second step. Sometimes, these techniques can be ineffective when the humeral head buttonholes through the inferior capsule and the soft-tissue envelope. In such cases, open reduction and repair of the injured structures would be required.²³ In our case we could reduce both shoulders by traction-countertraction method under anaesthesia and limbs were immobilized in chest arm sling. Usual recommendation is immobilization for three weeks after shoulder dislocation reduction. However, in our case the patient had bilateral greater tuberosity fractures so immobilization was given for 4 weeks to ensure fracture healing before start of physiotherapy and we could achieve satisfactory results in terms of painless shoulders with good range of motion and strength bilaterally.

5. Conclusion

Bilateral luxatio erecta is an uncommon entity with only few case reported in international literature. Bilateral inferior dislocation with fracture greater tuberosity is even rare with only one published case report. Typical attitude and mechanism of injury may help in establishing the diagnosis. However examiner always needs to be vigilant for the possibility of neurovascular lesions or injuries to the rotator cuff which would complicate this injury. Proper assessment and adequate treatment even with conservative means provides excellent result with minimal sequelae.

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.

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