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Case Report

A case of neglected bilateral anterior fracture dislocation of shoulder following seizure episode in a young schizophrenic patient treated with open reduction and internal fixation: a case report

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ABSTRACT

Bilateral shoulder injuries especially fracture dislocations are rare injuries and pose significant diagnostic and therapeutic challenges, especially in patients with psychiatric comorbidities. This report describes the successful management of bilateral anterior shoulder fracture dislocations with comminuted greater tuberosity and proximal humerus fractures in an adult patient with schizophrenia following the first-episode of a seizure. Even though anterior fracture dislocations with greater tuberosity fractures have been reported, cases of bilateral neglected anterior fracture dislocations involving greater tuberosity and proximal humerus with a displaced humeral head have never been reported. Our case report emphasises the importance of attempting anatomical reduction and stable fixation of both bony and soft tissue elements to achieve good clinical outcomes even in chronic injuries. This patient who was in his late twenties, on regular medication for schizophrenia presented to the Emergency room 10 days following the first episode of a generalised tonic clonic seizure with pain, swelling and deformity of both shoulders. On clinical and radiological evaluation, he had features suggestive of bilateral anterior fracture dislocations. He underwent greater tuberosity avulsion repair using suture anchors on the left and open reduction internal fixation with a PHILOS plate, cannulated screws and additional soft-tissue repairs on the right. The patient went on to have an excellent clinical outcome. This case underscores the importance of high clinical suspicion for bilateral shoulder injuries in patients on psychotropic medication with seizure episodes, meticulous surgical technique and involvement of multidisciplinary care to yield favourable outcomes in rare complex shoulder injury patterns.

Keywords: Bilateral shoulder injuries, Seizure disorder, Schizophrenia, Anterior fracture-dislocation shoulder, Neglected

INTRODUCTION

Seizure-induced shoulder injuries result from violent, unbalanced muscle contractions during tonic-clonic episodes and most commonly produce posterior dislocations. Anterior shoulder dislocations and fracture dislocations are very rare injuries and have been reported in literature in very limited numbers. They are often underdiagnosed in patients with psychiatric disorders such as schizophrenia, where seizures may be the presenting feature or result from antipsychotic medication.[1,2] Most of the reported anterior shoulder fracture dislocations are associated with greater tuberosity (GT) avulsion and carry higher morbidity due to associated rotator cuff disruption, articular damage and neurovascular risk.[3,4] Bilateral involvement associated with a combination of GT avulsion and displaced three-part proximal humerus fracture has never been reported. Delayed presentation, as in this case (10 days), increases the technical difficulty of reduction and repair because of soft-tissue contracture, haematoma

organisation and early callus formation. Surgical strategies must address both bony stability and rotator cuff integrity while protecting the axillary nerve and ensuring early mobilisation in patients who may have compliance issues related to their psychiatric condition. This case report details the presentation and management of such bilateral injuries in a tertiary care orthopaedic unit, highlighting a reproducible, single-stage surgical approach that achieved stable fixation and allowed immediate supervised rehabilitation. It adds to the sparse literature by demonstrating successful outcomes despite delayed presentation and psychiatric comorbidity.

CASE REPORT

A 29-years-old man was brought to the emergency room (ER) by his parents with complaints of pain, swelling and inability to move the shoulders 10 days following what it appeared to them as an episode of seizure. He was diagnosed to have schizophrenia 10 years back and was controlled on regular medications- haloperidol, trihexyphenidyl, clozapine and lorazepam. Based on the description by his parents he had the first episode of a generalized tonic clonic seizure (GTCS) resulting in bilateral shoulder injuries.

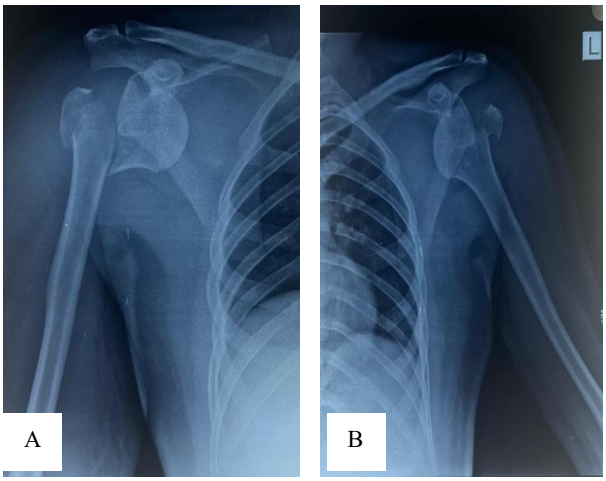

Figure 1(A and B): Pre-operative X-rays showing bilateral anterior fracture dislocations.

On examination, the patient was conscious, oriented, haemodynamically stable and afebrile. Both shoulders demonstrated swelling, loss of contour with hollowing, crepitus, tenderness and abnormal mobility. Neurological examination of both upper limbs revealed bilateral axillary nerve sensory deficits. The vascular examination was unremarkable. Plain radiographs of shoulders revealed anterior dislocation of both shoulders associated with a 3-part fracture of the right proximal humerus and GT avulsion of the left shoulder. A closed manipulative reduction (CMR) of the left shoulder was performed under moderate anaesthesia (ketamine) in the ER. A computed tomography (CT) imaging of the shoulders showed congruent reduction of left shoulder with displaced fracture of the GT and a dislocated right shoulder with 3 – part displaced fracture of proximal humerus. The patient was admitted for definitive surgical management. Medical optimisation was completed with input from neurology and psychiatry services to ensure seizure control and psychiatric stability. The proposed surgical procedure was explained in detail to the patient and kin including the risks (infection, neurovascular injury, stiffness, avascular necrosis (AVN), non-union and re-dislocation), benefits, complications, outcome and the long-term prognosis. Informed written consent for the intervention was obtained from the patient and his parents.

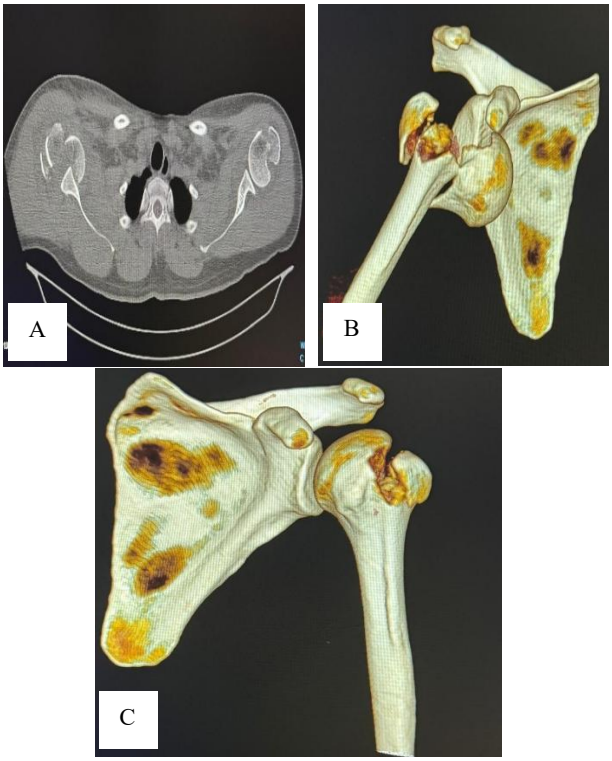

Figure 2 (A-C): Pre-op 3D CT images showing bilateral comminuted proximal humerus fractures with anterior dislocation.

Surgery was performed 14 days after the initial injury. The patient was placed in the standard beach-chair position. Both shoulders were prepped and draped simultaneously in standard fashion. A trans-deltoid approach was used for the left shoulder. After layered dissection, the displaced cuff avulsion fragment of the greater tuberosity was identified. A triple-loaded metallic suture anchor was deployed at the proximal end of the fracture site. Sutures were passed through the cuff GT junction strategically using a curved suture passer. Medial cuff sutures were tensioned, GT fragment reduced anatomically and secured on to a lateral-row knotless anchor (PEEK) placed distal to the fracture site forming a stable suture-bridge configuration. The axillary nerve was protected throughout the procedure. Reduction was confirmed under C-arm. The wound was cleaned and closed in layers; dressings were applied. A standard deltopectoral approach was utilised for the right shoulder. After standard layered dissection, recession of superior half of pectoralis major

tendon was carried out for the ease of access to the depth of the shoulder.

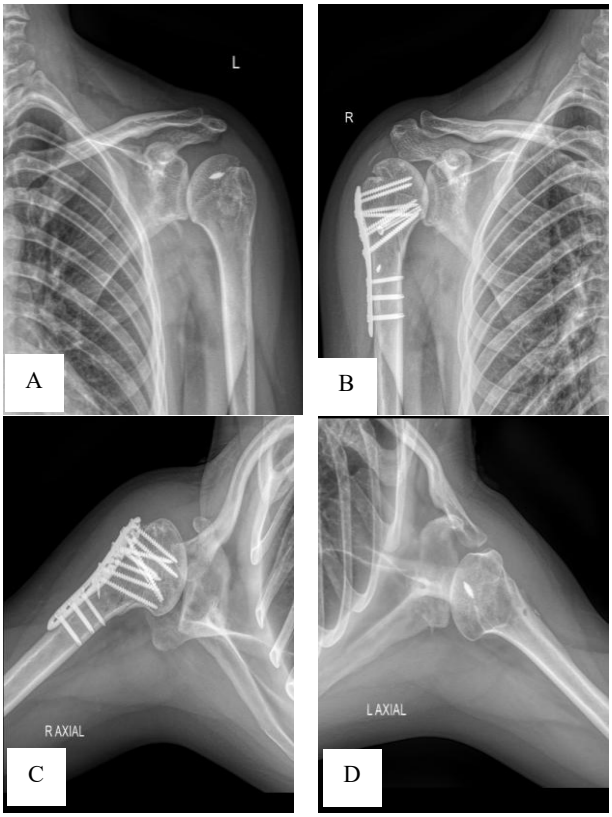

Figure 3 (A-D): Post-operative antero-posterior and axial X-ray images at 2 years follow-up showing well healed bilateral proximal humerus fractures, congruent reduction of shoulders with metallic implants in situ.

Subcoracoid location of the humeral head was identified with comminution of the superior aspect. Subscapularis attachment to the lesser tuberosity (LT) was intact. Cuff sutures were taken through subscapularis. Additional sutures were taken through the cuff tendons attached to the displaced GT. Using a Schanz pin inserted into the head of humerus as a joy-stick, the humeral head was reduced back to the glenoid. Using manipulative reduction, the humeral shaft, GT and head fragments were matched and provisionally fixed with K-wires.

Definitive fixation of proximal shaft and the humeral head was done using an independant 4 mm cannulated cancellous screw achieving good compression at the fracture site. Cuff sutures through supraspinatus and infraspinatus tendons were taken through plate holes of a 3-hole PHILOS plate which was used to fix the entire fragments anatomically with good stability and cuff sutures were tied down before screw insertion through the plate. Devitalized articular fragments at the superior aspect of the humeral head were discarded. Pectoralis major tendon repair was completed using a double loaded metallic suture anchor. Long head of biceps (LHB) tenodesis was performed in the sub-pectoral location. Wounds were washed, closed in layers and sterile aseptic compression dressings applied. The postoperative period was uneventful. Bilateral upper-limb neurovascular status remained status quo. The patient remained comfortable and afebrile throughout the postoperative period with no clinical evidence of deep vein thrombosis, fresh neurovascular deficit or infection. Pendulum exercises, active assisted elbow range-of-motion exercises and active forearm, wrist and finger movements were initiated the immediately following day of surgery. A staged physiotherapy protocol was initiated which involved active mobilisation of the shoulder from the fourth week and progressive strengthening of shoulder muscles including the rotator cuff from sixth week onwards.

Outpatient follow-up of the patient at 6 weeks showed progressive healing changes of the fractures on X-rays and a steady improvement in shoulder range of movements (ROM). At 3 months from surgery patient achieved pain-free full active ROM of both shoulders with good power in shoulder muscles and near complete return of axillary nerve sensation in both shoulders. At two years follow-up, the X-rays showed consolidated fractures with no signs of avascularity of humeral heads and the patient retained full pain-free movements of both shoulders with no signs of instability. Patient remained under out-patient neurology/psychiatry care for seizure management and psychiatric stability throughout the follow-up.

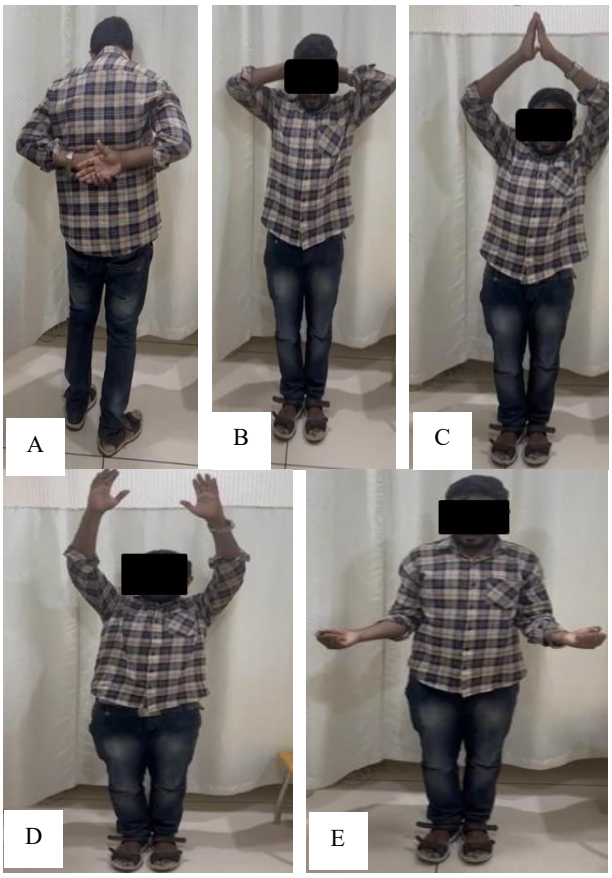

Figure 4 (A-E): Post op images showing shoulder function at 2 years follow-up.

DISCUSSION

Bilateral fracture dislocations of the shoulder are rare injuries, most commonly posterior in nature due to the unbalanced muscular contractions during seizure episodes, electrocution with anterior fracture-dislocations being exceptionally uncommon. In the context of seizure episodes, the powerful internal rotators and adductors typically drive the humeral head posteriorly, making bilateral anterior variants even rarer and often linked to atypical mechanisms or associated fractures such as GT avulsion.[1,5,6]

Literature on management of bilateral posterior fracture-dislocations frequently describe treatment ranging from closed reduction in acute cases to open reduction in cases which present late. Open reduction and internal fixation (ORIF) of associated proximal humerus fractures has been advocated for fracture dislocations involving proximal humerus other than GT.[1-6] Hemiarthroplasty/reverse shoulder arthroplasty have been suggested for cases with significant humeral head damage or delayed presentation. Complications in these injuries include AVN of the humeral head, recurrent instability, stiffness and neurovascular compromise, particularly when diagnosis is delayed. Neglected bilateral posterior dislocation cases with large reverse Hillsach's lesion (up to 15 months) have been managed with open reduction and modified McLaughlin procedure yielding moderate functional recovery but with risks of persistent limitation in elevation and abduction.[7]

Bilateral anterior fracture-dislocations, though rarer, show similar variability in management. Acute cases are often amenable to closed reduction when the fracture involves GT only, sometimes followed by conservative management if the shoulder is stable and the reduction of GT is acceptable. However, anterior fracture dislocations associated with displaced GT fractures or proximal humerus involvement frequently require ORIF using suture anchors for GT repair, plates/screws for humeral head/shaft fixation, or combined soft-tissue procedures (e.g., biceps tenodesis, subscapularis repair).[2-5]

In neglected or chronic anterior dislocations (beyond 3-4 weeks), closed reduction becomes challenging due to soft-tissue contractures, organized hematoma and early callus. In such cases, open reduction is preferred, utilising delto-pectoral or trans-deltoid approaches and definitive stabilization.[2] Some reports describe staged procedures or conversion to arthroplasty when joint preservation fails.

Complications mirror those of posterior variants but also include higher rates of rotator cuff dysfunction, persistent anterior subluxation, glenohumeral arthritis and axillary nerve injury (up to 55% in fracture-dislocations), with neglected cases carrying 20-50% major complication risks such as AVN, instability or poor functional shoulder scores. Treatment methods thus emphasize individualized approaches: conservative for minimally displaced stable reductions, ORIF with locking plates (e.g., PHILOS) or suture anchors for comminuted patterns and arthroplasty as a salvage option for irreparable damage.[8,9] In our case, we achieved excellent outcomes through a tailored, single-stage bilateral surgical intervention 14 days post-injury, despite the neglected presentation and psychiatric comorbidity. What we did particularly well was the meticulous preoperative multidisciplinary optimization involving neurology and psychiatry to ensure seizure control and patient stability, combined with precise intraoperative techniques: suture-bridge anchor fixation for the left GT avulsion (protecting the rotator cuff integrity) and comprehensive ORIF on the right using PHILOS plate, cannulated screws, cuff suture incorporation, biceps tenodesis, and pectoralis major repair. Axillary nerve protection thorough meticulous soft-tissue handling and immediate supervised rehabilitation were critical. This approach addressed both bony and soft-tissue elements while minimizing risks in a non-compliant patient profile.[8,9]

What was so special about our case is the unique combination of bilateral neglected anterior fracture-dislocations involving comminuted GT avulsion on one side and a displaced three-part proximal humerus fracture on the other a pattern not previously reported in the literature following a single seizure episode in a young schizophrenic patient. Despite the 14 days delay leading to soft-tissue contractures, we successfully performed joint-preserving anatomical reduction and stable fixation in a single sitting, achieving fracture union, pain-free full active range of motion and no AVN or instability at two-years follow-up.

This underscores the value of high clinical suspicion in psychotropic medication users, advanced imaging (3D CT) and aggressive yet reproducible surgical strategies in complex, bilateral shoulder trauma, even in delayed scenarios. This case highlights that timely, individualized open reconstruction rather than defaulting to arthroplasty can yield superior functional results in young, active patients, provided meticulous technique and multidisciplinary support are employed. It adds meaningfully to the sparse literature by demonstrating that good outcomes are achievable despite chronicity, psychiatric challenges, and bilateral involvement.

CONCLUSION

In conclusion, this case represents an exceptionally rare presentation of neglected bilateral anterior shoulder fracture-dislocations following a seizure episode in a young patient with schizophrenia. Despite delayed presentation, anatomical reduction, stable internal fixation and comprehensive soft-tissue reconstruction resulted in excellent long-term functional and radiological outcomes. This report underscores the importance of maintaining a high index of suspicion for complex shoulder injuries after seizures and demonstrates that joint-preserving surgical management, supported by multidisciplinary care can

achieve satisfactory outcomes even in chronic and technically challenging cases.

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