

Case Report

A combination of posterior fracture dislocation of shoulder and ipsilateral clavicle fracture following a road traffic accident: a rare injury pattern treated with internal fixation – a case report

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ABSTRACT

Posterior fracture-dislocation of the shoulder is an uncommon injury accounting for a small percentage of all shoulder dislocations and is frequently missed during initial evaluation due to subtle clinical and radiographic findings. The association of posterior proximal humerus fracture-dislocation with an ipsilateral clavicle shaft fracture is exceedingly rare and poses significant diagnostic and therapeutic challenges. Early recognition and stable fixation are essential to restore shoulder girdle anatomy and facilitate rehabilitation and optimal shoulder function. A young man in his twenties presented to the Emergency department (ED) of a level 3 trauma facility following a road traffic accident with complaints of swelling and painful restriction movements of his left shoulder. On clinical and radiological evaluation, he was diagnosed to have a closed posterior fracture dislocation of his left proximal humerus and ipsilateral closed midshaft fracture of the clavicle. He underwent open reduction and internal fixation of both the fractures within 24 hours of his initial presentation. At one year follow up he retains full function of his left shoulder without evidence of any complication. This case highlights the importance of prompt diagnosis and early intervention utilizing meticulous surgical technique for fixing such complex injuries anatomically to restore acceptable shoulder function. This also underlines the importance of long term follow up of such patients to watch for potential complications including osteonecrosis of humeral head, shoulder arthritis and persistent instability.

Keywords: Posterior fracture dislocation of shoulder, Clavicle midshaft fracture, Avascular necrosis of humeral head, Open reduction and internal fixation

INTRODUCTION

Posterior dislocation of the shoulder is an uncommon injury pattern and account for only 2%-5% of all shoulder dislocations, while associated fractures occur in less than 1% of cases.^{1,2} These injuries are most commonly associated with seizures, electrical injuries and high-energy trauma. Their infrequent occurrence and often subtle radiographic features contribute to a high rate of missed or delayed diagnosis. The etiology of posterior fracture-dislocation of the shoulder is commonly classified into of convulsive, electrical and traumatic causes, often referred to as the 'Triple E' mechanism: epilepsy, electric

shock and extreme trauma. Posterior shoulder dislocation associated with seizures results from violent involuntary contractions of the internal rotator and adductor muscles, which drives the humeral head posteriorly while the arm is maintained in a flexed, adducted and internally rotated position.¹⁻⁵ In contrast, posterior fracture-dislocation of the shoulder following road traffic accidents of high-energy nature is considerably less common and involves the application of an axial load to an adducted, flexed, and internally rotated upper limb resulting in posterior displacement of the humeral head accompanied by varying degrees of proximal humeral fracture. Such injuries are clinically significant because delayed recognition may

result in persistent pain, stiffness, AVN and long-term functional impairment.^{1,6}

Clavicle fractures being the commonest injuries of the shoulder girdle, occur secondary to a direct impact over the shoulder or indirect transmission of force through the upper extremity. The simultaneous occurrence of posterior fracture-dislocation of the shoulder and ipsilateral clavicle fracture suggests a complex mechanism of injury involving substantial force transmission across the shoulder girdle.⁷ However, there is a paucity of literature describing this injury pattern. We report a rare case of posterior fracture-dislocation of the shoulder associated with an ipsilateral clavicle fracture following a road traffic accident and discuss its possible biomechanical basis, diagnostic considerations and management strategy.

CASE REPORT

A 25-years-old gentleman who sustained a high energy road traffic accident (fall from a speeding two-wheeler on extended hand) presented to the ED with complaints of pain and swelling of left shoulder with restriction of movements of left arm. He was evaluated in the ED according to Advanced Trauma Life Support (ATLS) protocol and major injuries to vital organs were ruled out. On clinical evaluation of his left shoulder injury, he had swelling, deformity, crepitus, tenderness and abnormal mobility of his left clavicle. He also had loss of contour of his left shoulder with swelling and painful restriction of left arm movements with crepitus. He had a normal neurovascular status of his left upper limb.

A routine X-Ray evaluation of his shoulder revealed a comminuted fracture of his left clavicle mid shaft (AO Classification-15.2.B2) and comminuted fracture of his left proximal humerus with abnormal contours of the humeral head. CT scan with 3D reconstruction of images confirmed a posteriorly dislocated left shoulder and a comminuted fracture of proximal humerus with fracture lines through anatomical neck and lesser tuberosity.

He was initially managed with immobilization of the left shoulder with an arm sling, standard analgesia. No closed reduction attempts were made and he was prepared for an emergency surgery of the left shoulder at the earliest available theatre schedule.

Surgical technique

Under general anesthesia, the patient was positioned in a modified beech chair (30 degrees of reclination) ensuring a free access for the image intensifier. The whole left upper extremity was prepared and draped allowing exposure upto the medial end of clavicle. A standard deltopectoral approach to the left proximal humerus was taken with layered dissection of anatomical planes. Cephalic vein was identified and retracted along with the deltoid laterally. Superior half of pectoralis major tendon was recessed with suture tagging of tendon edges for the later repair. The long

head of biceps tendon (LHB) was found to be lacerated longitudinally and a tenotomy of the tendon with suture tagging was performed. After medial retraction of the conjoint tendon, the fracture site was exposed and the proximal humerus shaft, metaphysis and intact lesser tuberosity with attached subscapularis tendon were identified. After evacuating the fracture hematoma, an empty glenoid was visualized through the rotator interval. No evidence of chondral or labral injuries were identified in glenoid. A subscapularis tendon peel was performed from the lesser tuberosity and the tendon was retracted medially along with the conjoint tendon. Since a finger manipulation of the humeral head with distal traction of proximal humerus was unsuccessful to bring the displaced head back to the glenoid (largely due to a 180 degrees rotation of the displaced head with constant pull from the cuff tendons attached to greater tuberosity), a 3 mm smooth Kirschner wire (K-wire) was drilled to the displaced humerus head. By manipulating the K-wire, the humeral head was brought back to the glenoid and based on the fracture configuration, the fracture line was closed by approximating the proximal and distal fracture segments. Provisional K-wire fixation (2-mm K-wires) of the reduced fracture was performed allowing the space for future plate placement and the definitive fixation was achieved utilizing a proximal humerus locking plate (PHILOS). Subsequently, the subscapularis tendon was repaired anatomically to the lesser tuberosity using two-triple loaded metallic suture anchors. The surgery was completed with repair of the recessed pectoralis major tendon along with subpectoral tenodesis of bicep tendon utilizing all suture anchors (Q-FIX, Smith Nephew). A stable shoulder with full free range of motion was obtained at the end. The surgical wound was closed in layers and aseptic dressing was applied.

An approach to the superior surface of clavicle was taken via a longitudinal incision along the length of the clavicle. After layered dissection and isolation and protection of supraclavicular nerve branches, the comminuted fracture site was exposed. Fracture reduction and definitive fixation was achieved in standard fashion using the combination of an anatomically contoured clavicle locking plate and lag screw. The wound was closed and dressing was applied.

Postoperatively, the shoulder was immobilized in an arm sling and standard post-operative analgesia and antibiotics were administered. A staged physiotherapy protocol was followed wherein the patient was allowed only passive range of motion of the shoulder including pendulum exercises, scapular retractions and active assisted elbow, active forearm and hand movements for the first three weeks. From the fourth week onwards, active assisted range of motion of the shoulder using a wand in lying down position and full active range of motion of elbow were started. From the seventh week, full active range of motion of shoulder, rotator cuff and deltoid strengthening exercises were initiated. At three months post op, patient regained full active, pain-free range of motion of the

operated shoulder with good stability of glenohumeral joint in all positions of vulnerability.

Serial X-ray taken at 6th week and three months showed fully consolidated fracture with intact implants. Patient was subsequently discharged from regular follow-up.

On his last follow-up at 1.5 years, patient had full function of shoulder, was pain-free and showed no evidence of AVN of humeral head or implant failure on X-rays.



Figure 1: Pre operative X-ray of left shoulder showing proximal humerus fracture with abnormal humeral head contour and ipsilateral clavicle fracture.

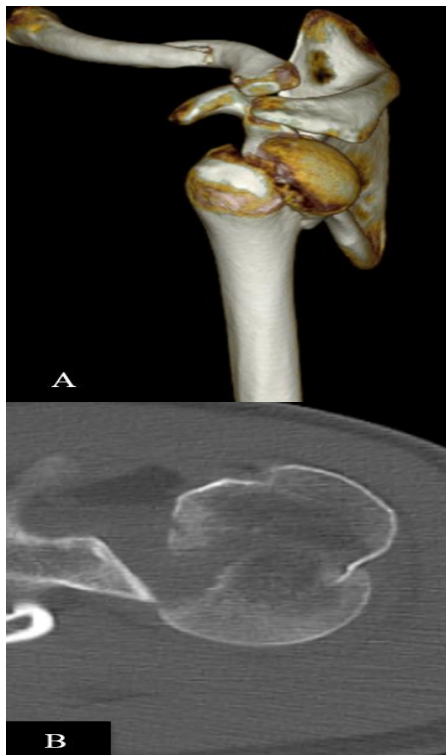


Figure 2: (A) 3D reconstruction (B) axial image of posterior dislocation of humeral head of fracture line extending to lesser tuberosity and a small reverse Hill-Sachs lesion.

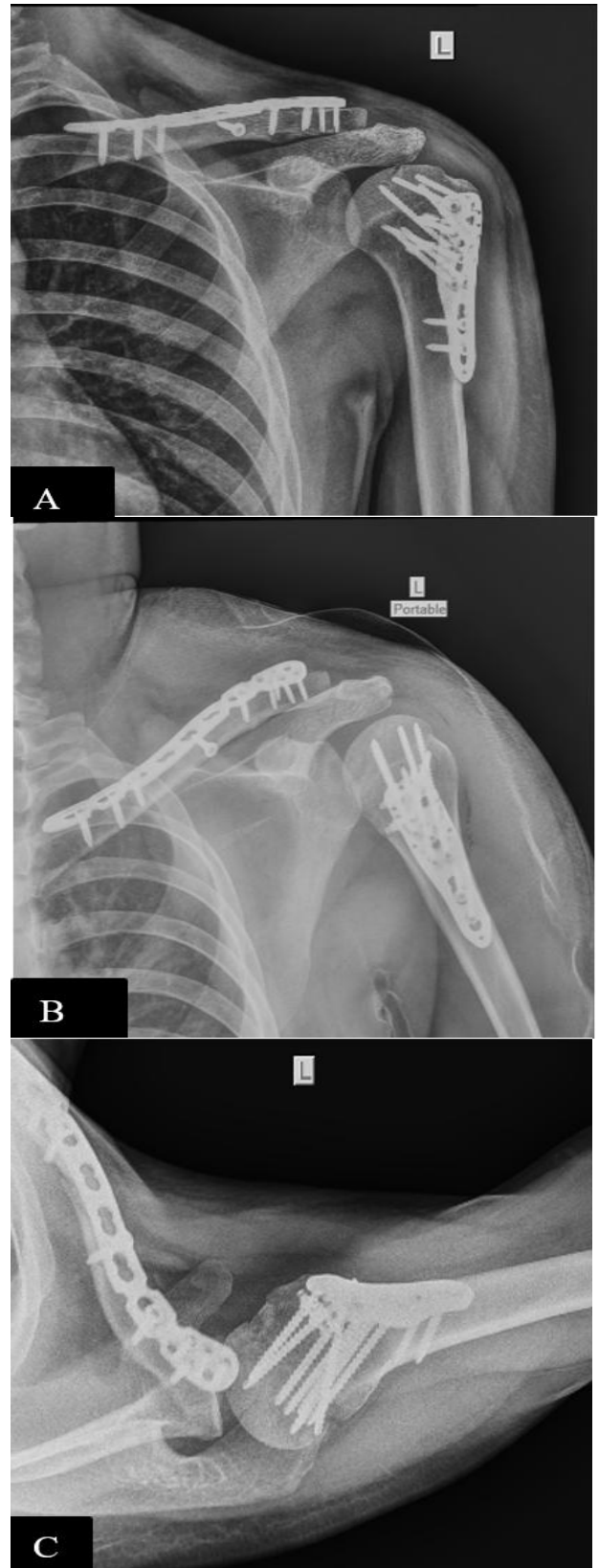


Figure 3: Post operative X-rays (A) AP view (B) Lateral view (C) Axillary view showing well reconstructed proximal humerus and clavicle fracture, a congruent shoulder joint articulation with implants *in situ*.



Figure 4: Follow up X-ray at 1 year, AP view of shoulder showing well healed fracture clavicle and proximal humerus with no evidence of AVN humeral head, implant failure and a congruent shoulder joint articulation.



Figure 5 (A-D): Post op image at 1 year showing well functioning left shoulder with full range of motion.

DISCUSSION

Posterior fracture-dislocations of the proximal humerus are uncommon but clinically significant injuries that differ substantially from the more frequently encountered osteoporotic proximal humeral fractures seen in elderly patients. These injuries typically occur in younger or middle-aged individuals and are most commonly associated with seizures, electrical injuries or high-energy trauma.^{1,2} Unlike anterior shoulder dislocations, posterior dislocations are frequently missed during initial assessment because of their rarity and subtle radiographic findings.^{2,6} When associated with a proximal humeral fracture, particularly through the anatomical neck, the injury pattern becomes exceptionally uncommon and presents unique challenges in diagnosis and management.^{1,6}

The present case is further distinguished by the coexistence of an ipsilateral clavicle fracture, creating a rare combination. The mechanisms responsible for clavicle fractures and posterior shoulder dislocations are fundamentally different, making their simultaneous occurrence unusual.⁷ Clavicle fractures typically result from a direct impact to the lateral aspect of the shoulder or a fall onto the shoulder, generating compressive forces across the clavicle and shoulder girdle.⁷ In contrast, posterior shoulder dislocations generally occur secondary to powerful internal rotation, adduction and flexion forces acting on the humerus.^{1,2} During seizures and electrical injuries, violent contraction of the internal rotators—including the subscapularis, pectoralis major, latissimus dorsi, and teres major—overpowers the relatively weaker external rotators, forcing the humeral head posteriorly.^{2,3,6} In high-energy trauma, a posteriorly directed axial load applied to an adducted and internally rotated arm can produce a similar injury pattern.¹

The coexistence of a clavicle fracture and posterior fracture-dislocation of the shoulder likely reflects a complex combination of injury mechanisms. An initial posteriorly directed axial force applied to an adducted and internally rotated arm generated posterior displacement of the humeral head and a consequent direct impact to the shoulder might have resulted in clavicular disruption. High energy trauma may therefore create sufficient energy to produce both injuries simultaneously.⁷

Analysis of the previously reported cases demonstrates that posterior fracture-dislocations most commonly involve fractures through the surgical neck, lesser tuberosity or impression defects of the humeral head.^{1,4,6} Fractures through the anatomical neck are distinctly uncommon because of the substantial force required to separate the humeral head from its metaphyseal attachments.^{1,6} In our patient, the principal fracture line traversed the anatomical neck, making the injury pattern particularly rare. Recognition of such fracture configurations is important because they may influence surgical strategy, fixation options, and the risk of subsequent humeral head osteonecrosis.^{5,6}

Numerous treatment methods have been described for posterior fracture-dislocations of the shoulder including closed reduction, percutaneous fixation, open reduction and internal fixation, hemiarthroplasty and reverse shoulder arthroplasty.^{1,5,6} The optimal treatment of posterior proximal humeral fracture-dislocations remains controversial because of the rarity of the injury and the limited availability of high-quality evidence.^{1,5} However, closed or minimally invasive techniques may risk further displacement of fracture fragments or additional injury to the surrounding soft tissues.^{1,6} Internal fixation provides the opportunity to restore anatomy and shoulder function while avoiding the long-term complications associated with prosthetic replacement.⁵ Nevertheless, head-preserving procedures are associated with recognized risks, including AVN, post-traumatic arthritis, fixation failure, and the potential need for secondary reconstructive procedures.^{1,5}

In the present case, open reduction was preferred because it allowed direct visualization of the fracture lines, facilitated controlled reduction of the humeral head and enabled accurate restoration of the articular anatomy while protecting the adjacent neurovascular structures.^{1,5} The surgical exposure also permitted careful assessment of fracture morphology and secure fixation.

Although shoulder arthroplasty has traditionally been advocated for complex fracture patterns, particularly when humeral head viability is questionable, outcomes remain variable.^{5,6} As these injuries often affect relatively young and active patients, preservation of the native humeral head remains an attractive option whenever feasible.⁵

In the present case, operative reconstruction resulted in satisfactory clinical and radiological outcomes with satisfactory fracture union, restoration of shoulder stability and acceptable functional recovery. The favourable outcome and absence of osteonecrosis may be attributable to preservation of residual vascularity to the humeral head.⁵ Intact capsular and periosteal attachments can maintain blood supply despite significant displacement, while preservation of soft tissues around the bicipital groove may protect the vascular contributions of the anterior circumflex humeral artery and its arcuate branch.⁵ Furthermore, the relatively young age and good physiological status of the patient may have contributed to fracture healing and maintenance of humeral head viability. This case highlights the importance of early recognition, detailed preoperative planning and meticulous surgical reconstruction in managing these rare and complex injuries.^{1,5,6}

Limitations

Further follow-up of the patient is required to evaluate for AVN of Humeral head even though the patient's current outcome is favorable.

CONCLUSION

Posterior proximal humeral fracture-dislocation associated with an ipsilateral clavicle fracture is an exceptionally rare injury pattern resulting from high-energy trauma. The differing biomechanical mechanisms required to produce these injuries make their simultaneous occurrence uncommon and diagnostically challenging. A high index of suspicion, thorough clinical assessment and advanced imaging with computed tomography are essential for accurate diagnosis and surgical planning. In young and physiologically fit patients, anatomical reduction and stable internal fixation can preserve the native humeral head, restore shoulder girdle anatomy and achieve excellent functional outcomes. Early intervention, meticulous surgical technique and structured rehabilitation are key to successful recovery. Nevertheless, long-term surveillance remains necessary because of the potential risk of humeral head osteonecrosis and post-traumatic degenerative changes.

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REFERENCES

1. Paparoidamis G, Iliopoulos E, Narvani AA, Levy O, Tsiridis E, Polyzois I. Posterior shoulder fracture-dislocation: A systematic review of the literature and current aspects of management. Chin J Traumatol. 2021;24(1):18-24.
2. Alao D, Connor SE. Posterior shoulder dislocation: it's worth another look. BMJ Case Rep. 2018;2018:bcr2018224486.
3. Mencia MM, Goalan R. Bilateral Posterior Fracture-Dislocation of the Shoulders Secondary to Uremic Encephalopathy. J Am Acad Orthop Surg Glob Res Rev. 2023;7(1):e20.00255.
4. Claro R, Sousa R, Massada M, Ramos J, Lourenço JM. Bilateral posterior fracture-dislocation of the shoulder: Report of two cases. Int J Shoulder Surg. 2009;3(2):41-5.
5. Gavaskar AS, Pattabiraman K, Srinivasan P, Raj RV, Jayakumar B, Rangasamy NK. What Factors Are Associated with Poor Shoulder Function and Serious Complications After Internal Fixation of Three-part and Four-part Proximal Humerus Fracture-dislocations? Clin Orthop Relat Res. 2022;480(8):1566-73.
6. Branca Vergano L, Landi S, Monesi M. Locked posterior fracture-dislocation of the shoulder. Acta Biomed. 2019;90(12):139-46.
7. Schliemann B, Theisen C, Kösters C, Weimann A. Combination of a floating clavicle and a posterior shoulder dislocation: An "Unhappy Triad" of the shoulder girdle. Int J Shoulder Surg. 2014;8(1):27-30.

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