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Positioning induced anterior shoulder dislocation after non-shoulder orthopaedic surgery in a polytrauma patient: a case report

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Case Report

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Abstract

Background

Anterior shoulder dislocation in a young polytrauma patient with no prior history of shoulder instability or injury is rare. Reports of this presentation are rare in the literature, and cases associated with postoperative limb positioning are scarcely described.

Case presentation:

We report a case of a 28-year-old Indian male who sustained multiple traumatic injuries including fractures of the right tibia and fibula, multiple phalanges of the right hand, and a right temporo-parietal subdural haemorrhage following a road traffic accident. The patient had no history of right shoulder injury and his right shoulder was unremarkable on initial evaluation. The patient was managed with closed reduction and internal fixation of the right tibial fracture with intramedullary nailing and K-wire fixation of the right fourth digit phalanx fractures under general anaesthesia. Postoperatively, the right upper limb was positioned in abduction and external rotation for elevation. On postoperative day two, the patient developed an anterior dislocation of his right shoulder, which was subsequently reduced using Kocher's technique. Subsequent follow-up confirmed joint congruity to be maintained.

Conclusions

This case report discusses improper postoperative limb positioning as a contributing, if not causative factor of anterior shoulder dislocation in this patient. It also aims to revisit postoperative care of polytrauma patients, including appropriate positioning of limbs and monitoring to detect any untoward occurrences, as was incidentally discovered in this patient on evening rounds.

Background

Dislocation of the shoulder as a postoperative complication in a patient without pre-existing shoulder instability is a rare occurrence, especially when the patient has not undergone any intervention of the shoulder. To our knowledge, no prior reports describe postoperative anterior dislocation solely due to limb positioning. Placement of the limb in abduction and external rotation represents a potential iatrogenic mechanism of the injury. Awareness of this potential complication and early identification are essential to prevent long-term morbidity. This case, possibly first of its kind, highlights a preventable cause of shoulder dislocation related to postoperative limb positioning. This case report underscores the importance of appropriate postoperative limb positioning along with vigilant monitoring to prevent avoidable musculoskeletal complications.(1–4)

Case presentation

A 28-year-old Indian male was brought to our casualty following a road traffic accident (2-wheeler vs 4-wheeler collision). There was no known history of previous shoulder instability, connective tissue disorder, epilepsy, or similar prior injuries. No significant medical comorbidities were reported.

On initial evaluation, the patient was diagnosed with:

1. Mid-shaft fracture of the right tibia and fibula (Fig. 1A and B)
2. Fractures of the proximal and middle phalanges of the fourth digit of the right hand; the remainder of the right upper limb examination was unremarkable (Fig. 1C and D)
3. Fracture of the middle phalanx of the fifth digit of the right hand (Fig. 1C and D)
4. Right temporo-parietal subdural haemorrhage

After being placed under observation in Neurosurgery ICU, neurological status was deemed stable, and the patient was cleared for surgery.

Timeline of events is as follows:

Date	Event
Day 0	Trauma sustained; injuries diagnosed. Primary orthopaedic care given and patient admitted to Neurosurgery ICU for observation.
Day 5	Clearance given for surgery under general anaesthesia by neurosurgeon.
Day 7/ POD 0	Surgical intervention for right leg fractures and right hand fractures under general anaesthesia and infraclavicular nerve block, right upper limb elevation given in abduction and external rotation.
Day 9/ POD 2	Right shoulder dislocation detected. Closed reduction of shoulder dislocation performed and post- reduction shoulder x-rays done.
1st Follow-up (3 weeks after relocation)	Follow-up radiographs of right shoulder demonstrated no bony abnormality and the patient reported no episodes of recurrent dislocation. Shoulder assessed clinically and found stable.

Radiographic imaging confirmed the fractures. Postoperative clinical examination on POD 2 revealed deformity and restricted movement of the right shoulder. Radiographic imaging confirmed anterior dislocation of the right shoulder.

The patient underwent:

- Closed reduction and internal fixation with intramedullary nailing of the right tibia under general anaesthesia. (Fig. 2A and B)
- Closed reduction and K-wire fixation of the middle phalanx of the fourth digit of the right hand under general anaesthesia and brachial plexus block. The right shoulder was found to be normal

throughout. (Fig. 2C and D)

Postoperatively, while the patient was in the supine position, the right upper limb was placed in abduction and external rotation for elevation (Fig. 3). On POD 2, the patient complained of pain in his right shoulder, aggravated by performing movements of his right upper limb. On examination of his right shoulder, the contour appeared flat, palpable bulge appreciated over the anterior aspect, with restricted and painful movements. The apprehension test was positive.

Based on the above findings and radiographs (Fig. 4), a diagnosis of anterior dislocation of right shoulder was made. Closed reduction of the right shoulder was successfully performed using the Kocher's technique, followed by immobilization.

Post-reduction, the patient showed satisfactory alignment of the shoulder joint with no immediate neurovascular deficits. Post-reduction x-rays showed successful relocation of humeral head in the glenoid cavity (Fig. 5). Pain and range of motion improved progressively. The limb was then placed in adduction, internal rotation and supported on the trunk of the patient (Fig. 6). The patient was advised immobilization followed by gradual physiotherapy. Clinical assessment and follow-up x-rays performed three weeks after reduction were normal (Fig. 7).

Discussion

The glenohumeral joint derives its stability from a combination of static stabilisers—namely the capsulolabral complex and glenohumeral ligaments—and dynamic stabilisers, including the rotator cuff musculature and periscapular muscles. The anterior capsulolabral complex, particularly the inferior glenohumeral ligament, is the primary restraint to anterior translation when the arm is abducted and externally rotated. Dynamic stabilisation of the shoulder is provided by the coordinated action of the rotator cuff and periscapular muscles, which compress the humeral head against the glenoid and maintain joint congruity throughout motion.(5–8)

Loss of muscular tone, whether due to anaesthesia, nerve block, or sedation, can significantly compromise this dynamic stabilisation. Under such conditions, even modest mechanical stress applied to the joint may result in displacement.(8–10)

From a biomechanical standpoint, the abducted and externally rotated position places the humeral head at the anteroinferior edge of the glenoid, where capsulolabral tension is greatest. In the presence of reduced muscular tone and lack of external support, this posture may allow gradual anterior translation of the humeral head. Prolonged maintenance of this position, particularly in sedated or immobilised patients, may therefore represent a potential iatrogenic mechanism of dislocation.(5–8)

Anterior shoulder dislocation occurring in the postoperative period following non-shoulder surgery is rare. In the immediate postoperative setting, residual anaesthetic-induced muscle relaxation combined with sustained positioning in abduction and external rotation may compromise dynamic stabilisation of

the glenohumeral joint, thereby predisposing it to instability. Prolonged abnormal limb positioning and inadequate external support further increase this risk, particularly in sedated or immobilised patients.(1–4) A previous case did report anterior shoulder dislocation following a brachial plexus block, attributed to loss of dynamic muscular stabilisation. However, that case occurred in the immediate procedural setting, whereas the present case describes a delayed postoperative dislocation associated with sustained limb positioning in abduction and external rotation. (11)

The perioperative period is associated with several factors that predispose to musculoskeletal complications. General anaesthesia leads to global muscle relaxation and suppression of protective reflexes, while regional anaesthesia reduces muscular tone and proprioceptive feedback in the affected limb. Residual neuromuscular blockade, analgesics, and sedatives may prolong these effects into the postoperative period. These factors, combined with sustained or improper positioning, can subject joints and soft tissues to abnormal mechanical stress.(9, 10, 12)

Positioning-related injuries during anaesthesia are well documented. Large retrospective analyses and closed-claims studies have identified peripheral nerve injuries, particularly involving the ulnar nerve, brachial plexus, and peroneal nerve, as significant complications associated with improper limb positioning. These studies draw attention to limb posture and adequate support during and after surgery. (9, 10, 12–14)

Reports of shoulder dislocation occurring in the perioperative setting are rare but have been described. Bilateral shoulder dislocations have been reported following seizures, electrical injuries, and electroconvulsive therapy. Such cases demonstrate that dislocation may occur in the absence of direct trauma when abnormal forces act on a relaxed or unsupported joint.(15–17)

From a systems perspective, this case highlights the importance of proper postoperative limb positioning, regular reassessment of limb posture, and heightened awareness among healthcare staff regarding positioning-related musculoskeletal complications. Early recognition in this patient allowed prompt management and helped prevent further morbidity. Postoperative shoulder dislocation represents a potentially avoidable adverse event when appropriate positioning precautions are not observed. Strict adherence to safe postoperative limb positioning protocols and avoidance of sustained abduction–external rotation in sedated patients is recommended.

Abbreviations

RTA Road Traffic Accident

POD Post Operative Day

ICU Intensive Care Unit

AP Anteroposterior

Declarations

Ethics approval: Not applicable

Consent to participate: Written informed consent was obtained from the patient for participation. Patient confidentiality has been maintained.

Consent for publication-:Written informed consent was obtained from the patient for publication of this case report and accompanying clinical details and images. Patient confidentiality has been maintained. A copy of the consent form would be available on request for review by the Editor-in-Chief of this journal.

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Authors' contributions:

1. TS: Case taking, treatment protocol, review of literature, manuscript writing, review and editing
2. SD: Case taking, treatment protocol, review of literature, manuscript writing, review and editing
3. SS: Review of literature, manuscript writing, review and editing
4. SN: Review of literature and editing
5. KD: Review of literature and editing
6. KA: Review of literature and editing

TS and SD contributed equally to the study.

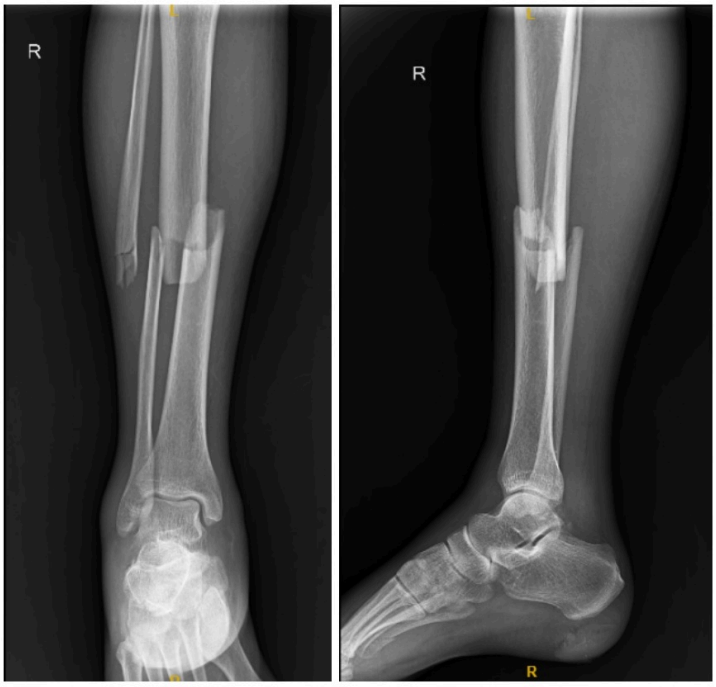
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Figures



(A) (B)



(C) (D)

Figure 1

Radiographs obtained on the day of injury following the RTA (Day 0): (A) AP view of the Right leg demonstrating mid-shaft fractures of the tibia and fibula; (B) Lateral view of the right leg showing the same fractures; (C) Anteroposterior view of the right hand demonstrating fractures of the proximal and middle phalanges of the fourth digit and the middle phalanx of the fifth digit.
(D) Oblique view of the right hand confirming the phalangeal fractures.

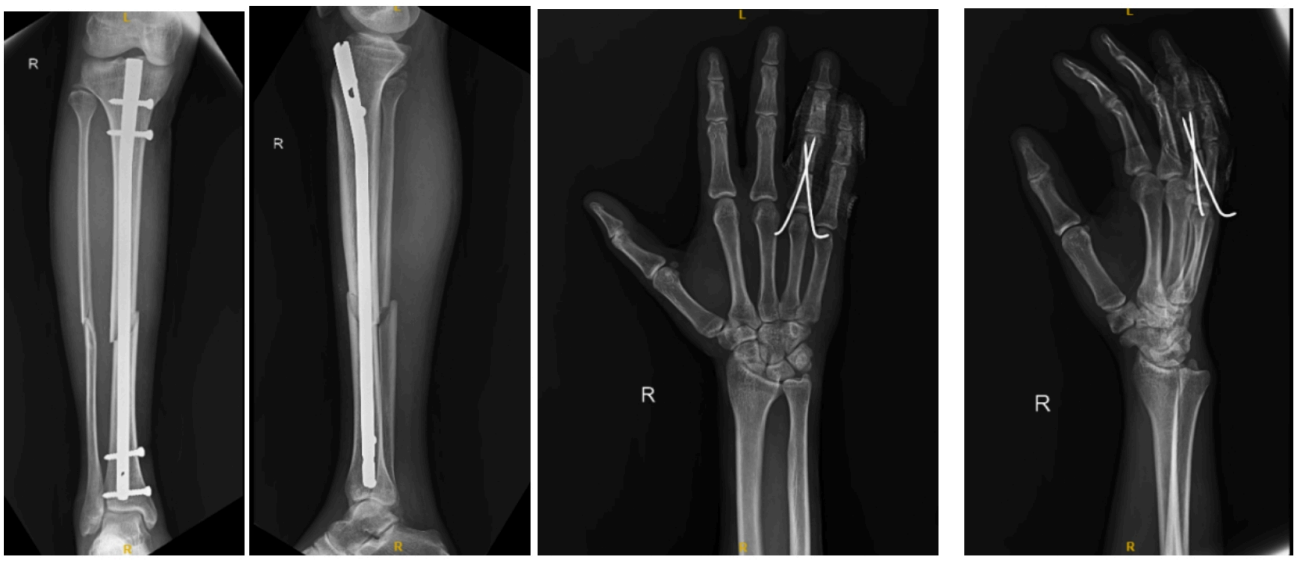


Figure 2

Postoperative radiographs of the right leg and right hand following surgical fixation.
(A) Anteroposterior view of the right leg demonstrating intramedullary nailing of the tibial shaft fracture.
(B) Lateral view of the right leg confirming alignment after fixation.
(C) Anteroposterior view of the right hand showing K-wire fixation of the fourth digit phalangeal fractures.
(D) Oblique view of the right hand demonstrating maintained alignment after fixation.



Figure 3

Postoperative positioning of the right upper limb in abduction and external rotation used for limb elevation while the patient was in the supine position.

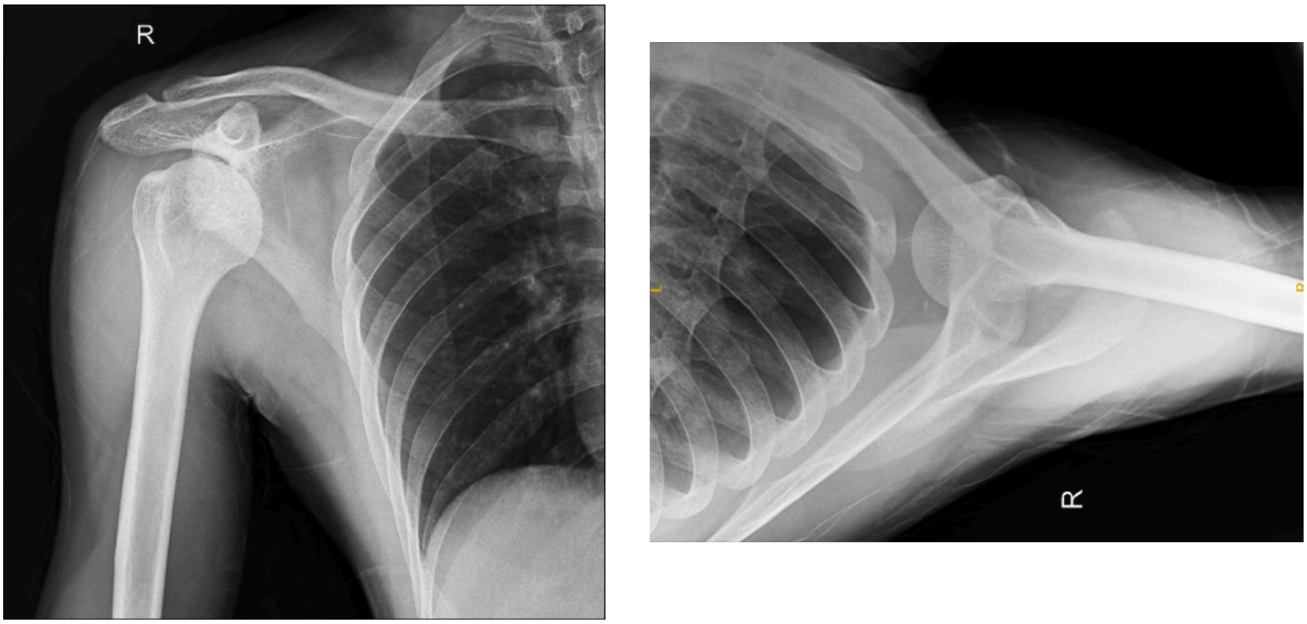


Figure 4

Radiographs of the right shoulder obtained on postoperative day two following clinical suspicion of dislocation.
(A) Anteroposterior view demonstrating anterior dislocation of the humeral head relative to the glenoid.
(B) Axial view confirming anterior displacement of the humeral head.

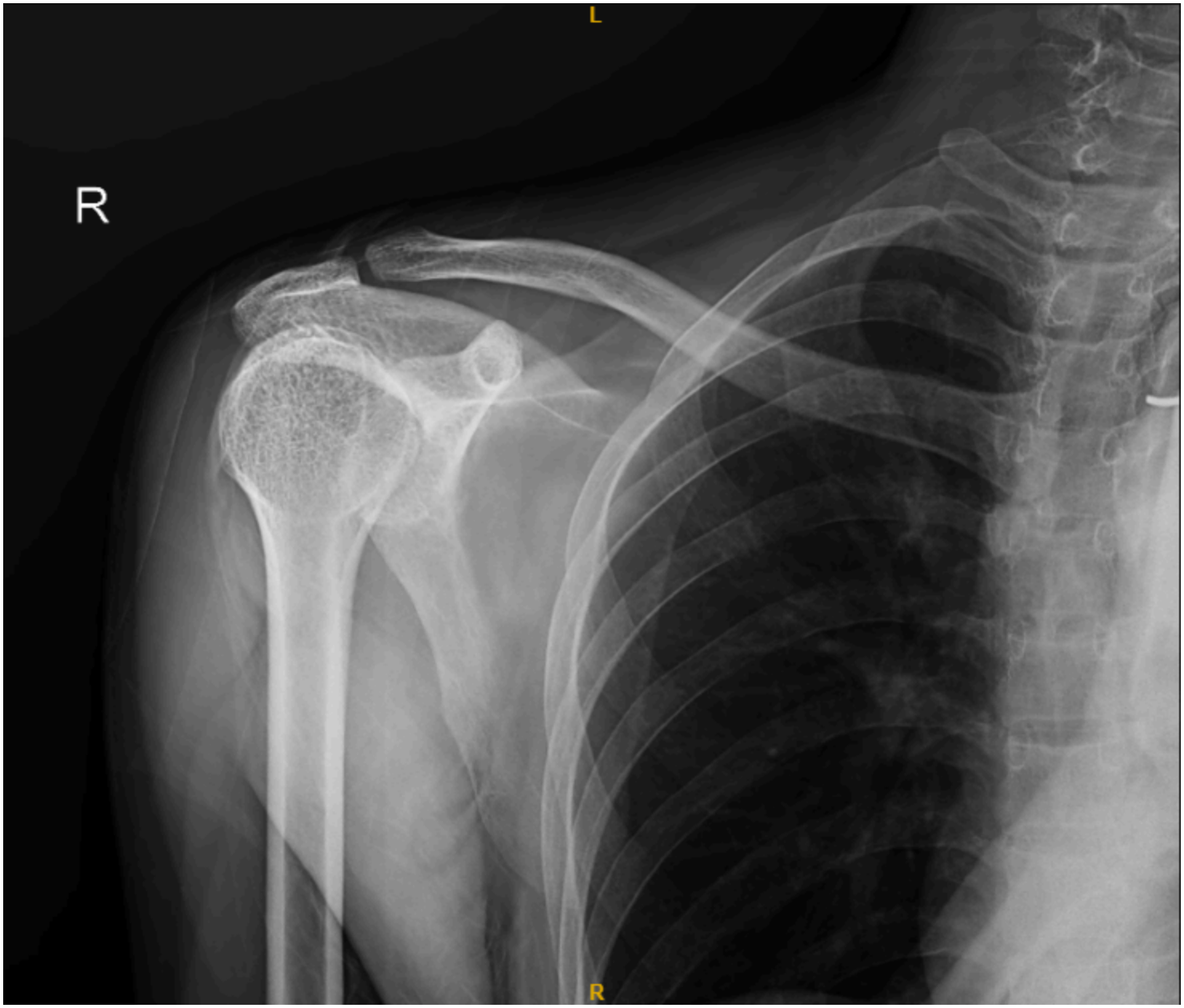


Figure 5

Post-reduction radiograph of the right shoulder on postoperative day two demonstrating concentric relocation of the humeral head within the glenoid cavity.



Figure 6

Post-reduction positioning of the right upper limb in adduction and internal rotation, supported against the trunk to maintain reduction and provide limb elevation.

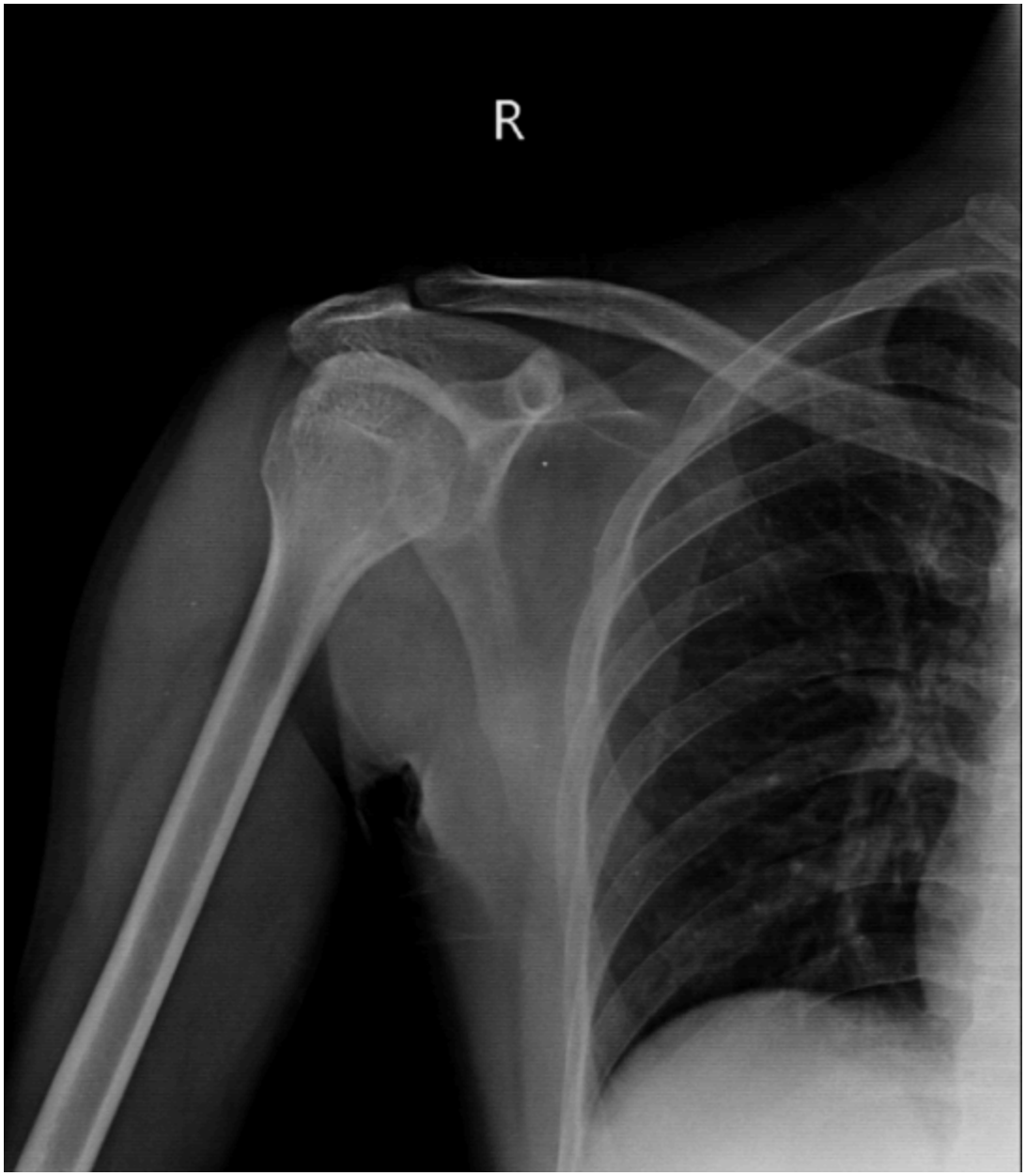


Figure 7

Follow-up radiograph of the right shoulder three weeks after reduction demonstrating maintained joint congruity without evidence of recurrent dislocation or bony abnormality.