CASE REPORT

Irreducible posterolateral elbow dislocation: a rare injury

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SUMMARY

Posterolateral dislocation of the elbow is an injury commonly treated in the emergency department by closed reduction. Very rarely it can be irreducible and require open reduction. Only four cases of irreducible posterolateral elbow dislocation have been described in the literature over the past 50 years. We report the case of a 20-year-old man who sustained such an injury. Open reduction was performed and revealed the radial head protruding or 'buttonholing' through the lateral collateral ligament complex. This case highlights that continued closed reduction of the elbow should not be attempted, as a mechanical block to reduction can occur making reduction impossible.

BACKGROUND

Posterolateral dislocation of the elbow is an injury commonly treated in the emergency department (ED) by closed reduction. Very rarely it can be irreducible and requires open reduction. Only four cases of irreducible posterolateral elbow dislocation have been described in the literature over the past 50 years. We report the case of a 20-year-old man who sustained such an injury.

CASE PRESENTATION

A 20-year-old right hand dominant man was cycling home when he fell from his bike landing on his outstretched left arm. He sustained no other injuries and self-presented to the ED. On arrival he had an obvious deformity of his left elbow and he was unable to flex or extend the joint. There was no neurovascular injury and distal pulses were present. Examination of the ipsilateral wrist and shoulder were normal. An X-ray of his left elbow was obtained and revealed a posterolateral dislocation with no associated fracture (figures 1 and 2).

Closed reduction under general anaesthesia was attempted twice in the ED but was unsuccessful. He then proceeded to theatre where closed reduction was attempted under regional anaesthesia but was once again unsuccessful. Open reduction was then performed. A Kocher approach was used, with an incision over the lateral aspect of the elbow. Dissection revealed the radial head protruding or 'buttonholing' through the lateral collateral ligament complex (LCLC) and joint capsule (figure 3). Reduction was still not possible and the distal LCLC was released and the radial head relocated. The joint capsule and LCLC were repaired with an anchored suture to the lateral epicondyle of the humerus. Reduction was confirmed radiographically and an above elbow cast was applied in a neutral position (figure 4).

Figure 1 Anteroposterior radiograph and lateral radiograph showing a posterolateral dislocation of the left elbow.

Figure 2 Pre-reduction image showing the deformity of the left elbow.

INVESTIGATIONS

X-ray of left elbow—anteroposterior and lateral projections.

TREATMENT

Closed reduction was initially attempted in the ED followed by an attempt in theatre. Open reduction was proceeded with through a lateral Kocher incision approach to the elbow joint. Dissection

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Figure 3 Intraoperative image showing the radial head 'buttonholing' through the lateral collateral ligament and joint capsule.

Figure 4 Intraoperative postreduction radiograph.

Figure 5 Studies published on irreducible posterolateral dislocation of the elbow. LCLC, lateral collateral ligament complex.

	Gender	Age	Mechanism of Injury	Associated fracture	Mechanical block
Devadoss et al. 1967	Female	7	Fall	No	Posterolateral joint capsule
Greiss et al. 1970	Female	17	Fall during tug of war	No	Radial collateral ligament and anterior joint capsule
Pawłowski et al. 1987	Male	24	Fall during football	No	LCLC and posterolateral joint capsule
Cameron et al. 2014	Female	84	Fall from standing height	No	LCLC
Fenelon et al. 2016	Male	20	Fall from bicycle	No	LCLC and posterolateral joint capsule

revealed the radial head protruding through the lateral collateral ligament complex and joint capsule. Division of the distal lateral collateral ligament complex was required in order to reduce the radial head. The LCLC was repaired after.

OUTCOME AND FOLLOW-UP

The patient was immobilised in above-an-elbow cast for 2 weeks following reduction. After which the cast was removed and graduated exercises with guidance of physiotherapy was started. The patient was counselled about avoiding heavy lifting activities and loading of the elbow joint. At follow-up 6 weeks post-operatively the patient had 5 to 130° of extension and flexion.

DISCUSSION

Dislocation of the elbow joint is the second most common type of joint dislocation and comprises 10–25% of all elbow injuries.^{1 2} The elbow is a complex hinge type joint stabilised by a combination of ligaments, muscles and joint capsule. Posterior dislocation of the joint is the most common direction of derangement. Dislocations can be simple, with no associated fracture or complex, occurring together with a fracture of the radial head, coronoid or olecranon.

The majority of elbow dislocations are managed conservatively with closed reduction. Reduction of the dislocation is achieved by applying traction with the elbow flexed at right angles while pressure is applied posteriorly to the olecranon to move it distally. Once the coronoid is passed the elbow is then flexed. Rarely open reduction is required as a result of a mechanical block due to a fracture fragment or soft tissue structure preventing reduction.

Access to the radial head can be achieved through a Kocher or posterolateral approach. It is important to pronate the arm in order to move the posterior interosseous nerve away from the surgical field. If the radial head is found protruding the LCLC and joint capsule division may be required in order to reduce it. It is important to repair the LCLC and joint capsule following this. In our case this was performed through an anchored suture into the lateral epicondyle of the humerus.

Despite posterolateral dislocation of the elbow being a common type of joint dislocation only four cases of irreducible posterolateral elbow dislocation have been described in the literature to date.^{3–6} These four cases have ranged in age, from 7 to 84 years and all including our case have not been associated with a fracture ([figure 5](#)). All injuries have occurred as a result of fall and required open reduction as a result of the radial head herniating or 'buttonholing' through the lateral collateral ligament complex.

Simple dislocation of the elbow is associated with a number of complications. All patients should be assessed for neurovascular injury on arrival to the ED as well as assessment of the wrist and shoulder to out rule a synchronous injury which can occur

in 10–15% of cases.¹ Brachial artery injury is rare but may occur before or after reduction and thus patients should be closely monitored following reduction.^{7 8} Stiffness and reduced range of motion can develop following elbow dislocation.² As result early active mobilisation is encouraged in order to avoid this. Other complications that can emanate from this injury include elbow instability, heterotrophic ossification of the soft

tissues and distal radioulnar joint instability. Patients should be informed of possible future difficulties.

Irreducible posterolateral elbow dislocation is a very rare event. This case highlights that continued closed reduction of the elbow should not be attempted, as a mechanical block to reduction can occur making reduction impossible.

Contributors CF, MMZ, GS and SK were involved in the patient's initial assessment, management and treatment. All authors were involved in the surgical management. CF was responsible for the images taken. All authors were involved in the writing and editing of the case.

Competing interests None declared.

Patient consent Obtained.

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Learning points

- ▶ All patients should be assessed for a neurovascular injury and synchronous injuries of the wrist and shoulder on arrival to emergency department.
- ▶ Continued closed reduction under anaesthesia should not be attempted as a mechanical block may exist and may result in further morbidity.
- ▶ It is important to repair the lateral collateral ligament complex and joint capsule once reduction is achieved.
- ▶ In a posterolateral approach to the elbow the arm should be pronated to move the posterior interosseous nerve away from surgical field.
- ▶ Close monitoring of the neurovascular status of limb should be continued after reduction.

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