

ELBOW DISLOCATION



“Venus Disrobing”, oil on canvas, c. 1870, Lord Frederick Leighton.

Venus was the Roman appellation for the Goddess of love and beauty. The Greeks called her Aphrodite. Although immortal she was not entirely invulnerable. When she tried to intervene on the battlefield during the Trojan War to save her badly wounded mortal son, Aeneas, the Greek hero Diomedes wounded her in the arm with his lance causing her to scream out in pain.

Lord Leighton's beautiful painting, "Venus Disrobing" appears to catch the moment following this incident when the Goddess disrobes to examine her injury. She appears concerned with her elbow. She supports her arm in a manner typical of those who suffer either a supracondylar fracture or a dislocation of the elbow. As she holds her elbow at forty-five degrees we can judge by the relative positions of her olecranon process and epicondyles, which of these two possibilities are more likely. As befitting a Goddess the relationship of these points appear to be perfect, perhaps Diomedes inflicted a non displaced supracondylar fracture rather than an elbow dislocation.

ELBOW DISLOCATION

Introduction

This is the second most commonly dislocated large joint, (after the shoulder joint)

Dislocation of the elbow requires considerable energy, and in many cases there will be associated fractures of adjacent bony structures.

There is always significant soft tissue injury.

Classification

Most classifications refer to the position of the ulna relative to the humerus.

Therefore dislocations can be:

1. Posterior

- By far the most common type.
- Usually occurs as a result of a fall on the outstretched hand with the elbow hyperextended.

Less commonly:

2. Lateral or medial (less commonly)

- These are produced by a similar mechanism to posterior dislocations, but with additional vector force, that displaces the radius and ulna as a unit either medially or laterally.
- This displacement is most often seen in combination with posterior dislocations.

3. Anterior

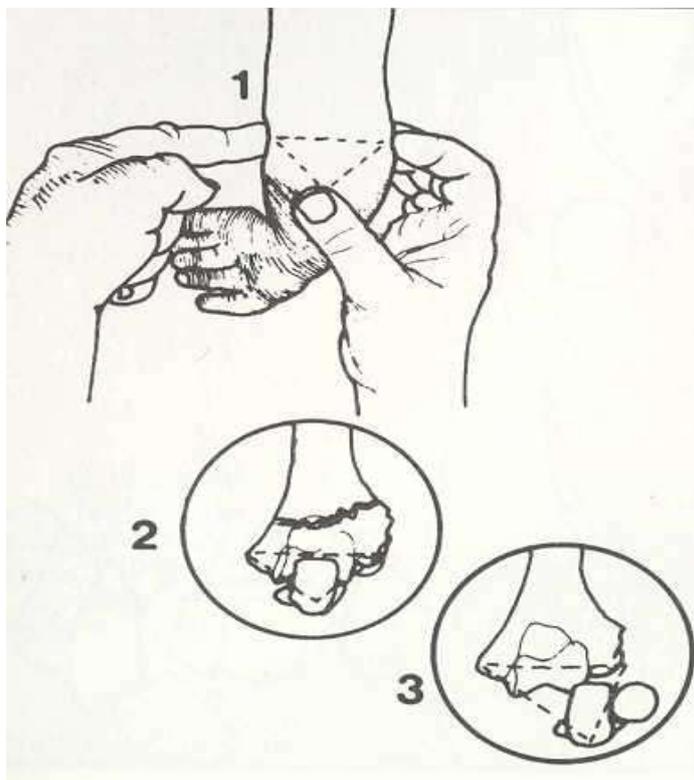
- This is rare.
 - Occurs as a result of a blow from behind to the olecranon while the elbow is in the flexed position.
 - This injury will frequently be associated with severe soft tissue injury and adjacent fractures
4. Divergent
- This is a dislocation between the proximal radius and ulna and are rarely seen in the ulno-humeral type

Clinical Features

For Posterior Dislocations

Clinical features include:

1. The elbow will usually be held in approximately 45 degrees flexion.
2. Severe pain and variable swelling
3. There will be marked prominence of the olecranon.
4. Clinically a dislocated elbow may be confused with a displaced supracondylar fracture. The 2 conditions may be distinguished clinically, however by examining the relationship of the olecranon to the epicondyles.¹



1. Normal relationship in flexed elbow

2. Normal relationship in supracondylar fracture.

3. Disturbed relationship in elbow dislocation.

- Normally the olecranon and epicondyles form a straight line in the fully extended elbow, whilst in the fully flexed elbow the olecranon forms an equilateral triangle with the epicondyles.
- In the supracondylar fractures the equilateral triangle relationship is preserved, whilst in a dislocation it will be distorted.



Typical appearance of a posterior dislocation of the elbow. ⁴

For Anterior Dislocations

1. The upper arm will appear shortened and the forearm elongated.
2. The elbow is fully extended and the forearm supinated.
3. The olecranon fossa is palpable posteriorly.

Complications

1. **Always check for neurovascular compromise, in particular look for injury to:**
 - **Brachial artery, (up to 8 % of cases)**
 - **Ulna nerve**
 - **Median nerve**

2. Associated bony fractures, (adjacent as well as more distal)

Late complications:

3. Myositis ossificans:
 - This is heterotrophic bone formation that may occur within the damaged soft tissues in front of the joint. It can result in chronic pain and restriction of movement.
4. Calcification of capsule or ligaments, again leading to restriction of movement.

Investigations

Plain Radiography



Posterior dislocation of the right elbow, lateral and A-P views.

Radiographs should be done in all cases, even if the clinical situation appears “clear cut”.

Fractures, especially displaced supracondylar fractures, may mimic dislocation clinically.

Views should include:

- A-P
- Lateral

CT Scan:

A significant number of cases will have associated adjacent bony fractures.

This has important additional implications for management and will require orthopaedic opinion.

If uncertainty remains post reduction about possible associated bony injuries, then the threshold for CT scan should be low.

Management

1. Analgesia:

- Titrated opioid analgesia will usually be required.

2. Reduction:

Reduction should be expedited, and is urgent if there is neurovascular compromise.

- This can usually be done in the ED resus cube using IV sedation.
 - ♥ Propofol or ketamine or morphine/ midazolam are sedation options.
- A Bier's block technique is an alternative in selected cases.

Reduction for posterior dislocations:

- Distal traction on the wrist with the elbow in some flexion with counter traction on the humerus. Direct pressure with the thumbs over the olecranon process will also be helpful.

Reduction for anterior dislocations:

- Distal traction on the wrist, together with backward pressure on the forearm and counter traction on the humerus.

3. A post reduction film should be done to confirm elbow position.

4. Observe patient in the resus cube until fully awake.

5. If reduction cannot be obtained, then refer to orthopaedics for reduction under general anaesthesia.

6. Apply a **backslab** to the arm in 90 degrees flexion and a **sling**.

Disposition

1. Admission may be required in some patients, especially the elderly for ongoing analgesia and general nursing, (physiotherapy / care coordination referrals should be done in these cases).

2. Physiotherapy
 - Associated soft tissue injury is often extensive in these injuries and physiotherapy is an important aspect of management. All patients should have a follow-up physiotherapy referral.
 - Immobilization should be for **2 weeks**.²
 - Gentle mobilization should be encouraged after **1 week**. Prolonged immobilization will lead to joint stiffness, whilst immobilization that occurs too early may predispose to myositis ossificans.²
3. Orthopaedic follow-up is also important in these cases.

References

1. McRae R, Practical Fracture Treatment, 3rd ed, p.142
2. Dislocations of the Elbow, in Apply's System of Orthopedics and Fractures, 7th ed 1993, p. 588-99.
3. Geiderman J.M, "Humerus and Elbow Injuries" in Rosen's Emergency Medicine, 5th ed 2002 p. 571-573
4. Ferguson D, Fodden D. Accident and Emergency Medicine, Churchill Livingstone, 1993

Dr J. Hayes
Dr Peter Papadopoulos.
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