Case 8413

Posterior Elbow Dislocation
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Section: Paediatric radiology
Case Type: Clinical Cases
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Patient: 10 years, male

Clinical History:
Fall on outstretched hand during football game.

Imaging Findings:
A right-hand dominant boy fell and landed on his outstretched left hand, while trying to do a overhead kick at football. A loud ‘crack’ was heard, followed by intense pain in the left elbow. The patient attended the emergency department. Initial examination of the left upper limb revealed a painful left elbow with a flexion deformity. There was no neurovascular compromise.

AP and lateral radiographs of the left elbow were obtained (figure 1). These showed a posterior dislocation of the elbow. No obvious associated fractures were identified. The patient underwent closed reduction under general anaesthesia (figure 2), and made an uneventful post-operative recovery.

Discussion:
Elbow dislocations account for 3-5% of all elbow injuries in the paediatric population. The mechanism of injury is usually a fall with the forearm in supination, which typically occurs either during sporting activities or with a simple fall. Posterior dislocations account for the majority of cases (95%).

The diagnosis is usually straight forward, with the clinical evaluation and examination being followed by radiographs of the affected joint. Anterior posterior (AP) and lateral projection of the elbow is routinely obtained first. With elbow dislocation, radiographs of the entire radius and ulna should also be considered, to exclude a potential fracture more distally in the forearm; in this instance, none was identified.

Care must be taken when interpreting the films, to identify any associated fractures, which occur in up to 46% of children, and to distinguish between a dislocation and a displaced supracondylar fracture. Medial epicondyle fractures are those most commonly found in association with elbow dislocations (33% of cases). Other types include fractures of the radial head or neck, and ulnar coronoid process fractures.

In this case, it was difficult to exclude a fracture from the pre-treatment AP elbow view due to the flexion deformity from the posterior dislocation. Post reduction elbow radiographs are more useful in excluding a potential fracture. The orthopaedic surgeons will generally confirm or refute an associated fracture using the image intensifier at the time of surgery, and formal radiographs will then be obtained following application of the cast. UK-practice discourages the taking of comparison views of the non-injured limb.

Computed tomography (CT) is useful to assess complex fractures, to determine whether the fracture extends into the epiphyses. Multiplanar and 3D reconstructed images can help with surgical planning. MRI is helpful to further investigate suspected cartilage and soft tissue damage, and may be extended by performing an MR arthrogram, to
examine the integrity of synovial surface, joint capsule and ligaments. However, in younger patients, the requirement
to sedate or anaesthetise them for an MR examination, adds to the risk of the procedure, and will perhaps increase
the delay before surgery, depending upon the anaesthetic provision for imaging investigations in a given individual
institution. MR should be performed, if its results will significantly affect the surgical management of the child.

The recommended management of an elbow dislocation consists of closed reduction under general anaesthesia or
sedation (less common), followed by immobilisation in plaster for approximately 3 weeks. Post reduction
radiographs are then performed to assess the joint position, and possible displacement of any associated fractures.

Complications though uncommon, include neurological injuries to the ulna or median nerves. Long term
complications include ongoing elbow instability, and stiffness with extension deficit. Less commonly occurring are
myositis ossificans and radio-ulnar synostosis.

**Differential Diagnosis List:** Posterior elbow dislocation

**Final Diagnosis:** Posterior elbow dislocation

**References:**


Description: AP view of left elbow in POP, following closed reduction. Alignment is now anatomic. No fractures are seen through the cast. Origin:
Description: Lateral view of the left elbow in POP, following closed reduction. Alignment is now anatomic. No fractures are seen through the cast. Origin:
Figure 2

Description: AP view of the left elbow showing a complete dislocation. Origin:
Description: Lateral view of the left elbow confirming the dislocation to be posterior. There is an elbow joint effusion present (note the displaced fat pads). No associated fractures are identified. Origin: