

Chapter 6:

Fracture in Children:

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A) FRACTURE OF LATERAL CONDYLE OF HUMERUS

The Lateral condylar epiphysis is largely cartilaginous, which begins to ossify during first year and fuses the humerus shaft at 12-16 years. The child falls on hand with elbow extended and forced into varus. A large fragment of lateral condyle breaks off and pulled by attached wrist extensors. The bone fragment may look deceptively small on X-rays. The muscle pull causes displacements. In severe injury, the elbow may dislocate posterolaterally and condyle is capsized by muscle pull and remain capsized while the elbow is reduced spontaneously this fracture is important because of 1) may damage the growth plate and 2) it always involves the joint. So it's early diagnosis and reduction is of utmost importance to avoid poor outcome.

On examination, the elbow is swollen and tender on lateral condyle. Passive flexion of wrist is painful. It has been classified into two types.

1) A fracture lateral to trochlea and elbow joint is not involved

2) The fracture through the middle of trochlea. This is more common usually grossly displaced and unstable elbow. It carried with it a triangular piece of metaphysis

In addition to standard two X-rays views, an internal oblique view should be done to prevent wrong diagnosis.

Treatment: It depends upon the displacement of fracture fragment. If it is undisplaced, then arm should be splinted in backslab with elbow in 90degree of flexion. It is essential to repeat the X-rays after 5 days to check its displacement.

A displaced fracture should be assessed carefully. An accurate reduction and internal fixation should be done.

Complications: Non union and malunion are two common complications of this fracture. If fragment is capsized then non union is inevitable and growth of elbow is increasingly valgus and tardy ulnar nerve palsy can develop. Even Minor displaced fracture fragment produce malunion that can lead to ulnar nerve palsy in later life.

B) PULLED ELBOW:

This injury is seen usually in 2-3 years old child. In young children the elbow may be injured by pulling on the arm. It is the subluxation of the orbicular ligament which slips up over the head of radius into radiocapitellar joint. A child is brought to clinician with history of jerk by the arm and crying out in pain. Forearm is usually held in pronation and extension. There are no X-rays changes.

A dramatic cure is achieved by forcefully supinating and then flexing the elbow. During this manoeuvre ligament slips back with a snap.

C) CLAVICLE FRACTURES:

It usually occurs by fall on an shoulder or on outstretched hand.. Midshaft clavicle fractures are common. It usually heals without complications. In adults, clavicle fractures are also common accounting for 2.6-4% of fractures and about 35% of all shoulder injuries. Outer fragment is pulled down by weight of arm and inner half is held by up by sternomastoid muscle. AP view and with 30degree cephalic tilt x-rays are required for diagnosis.

Classification: Group-1: Mid third fractures

Group-2: Lateral third fractures

Group-3: Medial third fractures

Treatment: Usually undisplaced fractures are treated conservatively. Non- operative management consists of applying a simple sling in figure of eight with arm pouch.

Malunion is the most common complications for clavicle fractures. In Lateral end fractures and in non unions operative management with plating or intramedullary fixation is required.

D) SUPRA CONDYLAR HUMERUS FRACTURES:

These are commonest fractures in children. They are of two types- flexion and extension type. The most common is hyperextension type (95%) usually caused by fall on the outstretched hand producing posterior displacement of bone. The remaining 5% is flexion type causing anterior displacement of bone. This is usually produced by fall when joint is in flexed position.

Classification:

Type-1: it is usually undisplaced fractures

Type-2: usually posterior cortex is in continuity

2A: injury in which distal fragments are usually less angulated.

2-B: this injury produces both angulation and malrotation

Type-3: this is completely displaced fracture, but posterior periosteum is usually preserved. The fragments may be displaced posterolateral or posteromedial.

The children usually complained of pain with swelling around elbow region. There is always a history of fall. On examination, there will be deformity of elbow joint.

On X-rays, in undisplaced fractures there will be loss of fat pad sign. This sign is a triangular lucency in front of the distal humerus. In normal lateral view, if a line is drawn along anterior cortex of the humerus this will cross the middle of the capitulum. Any deviation from this usually suggests fractures. On AP view measurement of Baumanns angle is helpful in determining fractures. This angle which is subtended by the longitudinal axis of humerus shaft and the line drawn through the coronal axis of the capitellar physis. Normally this angle is less than 80 degree.

Treatment: It usually depends upon the displacements of distal fragments.

Type-1: These type of fractures are usually immobilized in 90 degree of flexion and neutral rotation in a POP splint. X-ray should be repeated after 5-7 days and this splint should be continued for 3 weeks.

Type-2A: These fractures should be reduced under general anaesthesia in a stepwise manoeuvre.

Reduction Procedure: Patient should be under General anaesthesia and 1) traction should be applied along the length of the arm with counter traction above elbow level. 2) correction of tilt Or rotation of arm 3) gradual flexion of the elbow to 120 degree and pronation of forearm, while maintaining traction and giving finger pressure from behind distal fragments to correct posterior tilt.

If this is unstable, then fixation with K -wires should be done. Following reduction, the arm should be held in a collar and cuff. The circulation of limb should be checked regularly during first 24 hours.

Type 2-B and 3: These fractures are usually unstable and require fixation. There is a considerable risk of neurovascular injury. The fractures should be reduced under general anaesthesia and fixed with percutaneous K wires.

Open reduction and internal fixation (ORIF) should be done in highly unstable fractures.

Flexion type of fractures should be reduced by pulling elbow in semi flexed and applying thumb pressure to distal fragments and the extending the elbow carefully while checking neurovascular circulation.