The shoulder and the upper arm

Fractures of the clavicle

Mechanism

1. Fall on the shoulder.
2. Fall on outstretched hand.
   - In mid shaft fractures, the outer fragment is pulled down by the weight of the arm and the inner half held up by the sternomastoid muscle.
   - In the fractures of the outer third, if the ligament is intact the displacement will be a little, but if the coraco-clavicular ligaments are torn, displacement may be severe.

Clinical features

1. Pain.
2. Swelling (subcutaneous lump) with sharp fragment threaten the skin.
3. Limitation of shoulder movements.
4. Palpate for pulses although vascular injury is very rare but if happen very serious.

X-ray

Usually the outer fragment lies below the inner one.

Treatment

1. Middle third only support the arm by sling for 2-3 weeks, the active exercise is essential.
2. Outer third with torn ligament i.e. severe displacement may need open reduction and internal fixation by plate and screws or by K. wire.

Complications

Early: vessels and nerve injuries which are very rare.

Late

1. Non-union, usually happen if surgery done for mid shaft fractures.
2. Malunion usually leaves a lump without disability. Treatment is needed only for cosmetic reasons.
3. Stiffness, if active exercise not done. It is usually a temporary stiffness.
Fractures of the scapula

Types and Mechanism

1. The body of the scapula by a crushing force.
2. The neck of the scapula by blow or fall on the shoulder.
3. Coracoid process by avulsion force.
4. Acromion process by direct force.
5. The glenoid rim usually in association with shoulder dislocations.

Clinical features

1. Pain.
2. Swelling.
3. Tenderness.
4. Inability to move.
5. Bruises over the scapula.

X-ray show fracture of one or more parts of the scapula.

C-T scan show more details about glenoid fractures.

Treatment

1. Fractures of the body and undisplaced fractures need only sling for 2-3 weeks.
2. Intraarticular and displaced fractures need open reduction and internal fixation.

Complications

Early

2. Neurovascular injuries especially the brachial plexus.

Late

Shoulder stiffness.

Acromio-clavicular joint injuries

Mechanism

Fall on the shoulder leads to acromio-clavicular ligament tear and upwards subluxation of the clavicle. In more severe injury, also the coraco-clavicular ligament tears and complete dislocation of the joint will happen.
Clinical features

1. Pain.
2. Bruises.
3. Limitation of movement.
4. Tenderness without deformity (strain or subluxation).
5. Tenderness with deformity in form of prominent step can be seen and felt.

X-ray

usually obvious for the complete dislocation, if not stress film is needed by taken AP view for both shoulders with patient upright, the arms by the side and holding a 5 Kg weight in each hand. The distance between the coracoid process and the lower border of the clavicle is measured, the difference more than 6 cm indicates acromio-clavicular joint dislocation.

Treatment

1. Subluxation usually does not affect the function and does not required special treatment, only sling for one week follow by active exercise.
2. Dislocation
   a. Padding and strapping.
   b. Open reduction and internal fixation.

Complication

a. Joint stiffness and disability.
b. Osteoarthritis.

Sterno-clavicular dislocations

Mechanism

Lateral compression of the shoulder. It is of 2 types

a. Anterior dislocation more common type.
b. Posterior dislocation.

Clinical features

- Anterior dislocation is obvious, there will be a prominent lump over the sternoclavicular joint, it is painful but no cardiothoracic complications.
- Posterior dislocation is rare but more serious. Severe pain, associated with tracheal or major vessels injury also may associated with ribs fractures. Sometime the patient dyspnoeic or shock.
X-ray

Plain x-ray is difficult to interpret and c-t scan is the ideal method to diagnose the dislocation.

Treatment

Anterior dislocation close reduction by pulling the arm in abduction with exerting pressure on the clavicle. If failed open reduction.

Posterior dislocation is orthopedics emergency close reduction should be tried if failed open reduction.

Dislocation of the shoulder

Anterior dislocation of the shoulder

98% of shoulder dislocations are anterior. Shoulder dislocation is the most common dislocation among the large joint dislocations. This is due to the following factors

1. Shallowness of the glenoid socket.
2. The extraordinary range of movement.
3. Underlying conditions like ligamentous laxity and glenoid dysplasia.

Mechanism of injury

Dislocation is usually caused by a fall on the hand. The humerus is driven forward, tearing the capsule or avulsing the glenoid labrum.

Clinical features

1. Severe pain.
2. The patient supports the arm with the opposite hand and resists any kind of examinations.
3. The lateral outline of the shoulder is flattened.
4. Bulge felt just inferior to the clavicle.
5. Nerve and vessels of the affected limb should be examined.

X-ray

1. AP view show overlying shadow of the humeral head and the glenoid fossa, with the head lying below and medial to the socket.
2. Lateral view shows the humeral head out of the line with the socket.
Treatment

Reduction under anesthesia as soon as possible. Many reduction methods are recorded:

1. Gentle traction is used for recurrent dislocations.
2. Gently increasing traction to the arm with the shoulder slight abducted and the assistant applied counter traction to the body.
3. Kocher’s method, the elbow bend 90°, without traction the arm rotated slowly 75º laterally, then the elbow lifted forward, and finally rotated medially.
4. Reduction should checked by x-ray.
5. Active abduction should be tested to exclude axillary nerve injury.
6. Arm is rested in sling for a week or two then active exercise begun.

Complications

EARLY

1) Nerve injury
   a) Axillary nerve lead to deltoid muscle paralysis (inability to abduct the shoulder).
   b) Posterior cord of brachial plexus injury.
2) Vascular injury: the axillary nerve may be damaged.
3) Fracture-dislocation: the following fractures may associated with dislocation
   a) Humeral head.
   b) Proximal humerus.
   c) Greater tuberosity.
   d) Glenoid cavity.
   e) Acromion process.

LATE

1) Shoulder stiffness: due to prolonged immobilization and delayed active exercise.
2) Unreduced dislocation: sometime in unconscious or elderly patient the dislocation of the shoulder will be missed. If this condition discovered within 6 weeks closed reduction can solve the problem. After 6 weeks open reduction is indicated.
3) Recurrent dislocation: if dislocation tears the capsule, repair occurs spontaneously and the dislocation will not recur; but if the glenoid labrum is detached or the capsule is stripped from the neck of the glenoid, spontaneous repair is less likely and recurrent dislocation is common. The patient will give history of frequent dislocations and apprehension test will be positive in which when abduction and lateral rotation applied to the arm the patient will aware that dislocation will happen so the patient will resist that movement.

Posterior dislocation of the shoulder

It is rare and accounting for less than 2%.

Mechanism

By indirect force producing marked internal rotation and adduction, this happen during convulsion or with an electric shock.
Clinical features

1) Usually missed because AP x-ray usually appears normal.
2) Pain and swelling.
3) Coracoid process apparent.
4) Flat shoulder.
5) Arm held and locked in medial rotation.
6) Looking from above posterior dislocation apparent.

X-ray

1) AP view: the humeral head looks like electric light bulb and empty glenoid sign in which the head appear stand away from the glenoid cavity.
2) Lateral view is essential for diagnosis.
3) C-T scan may be needed in difficult cases.

Treatment

- Closed reduction by manipulation under anesthesia, sling for 3 weeks then active exercise.

Complications

- Same of those of anterior dislocation.

Fractures of the proximal humerus

- More common in osteoporotic, postmenopausal women.
- Might associate with dislocation of the shoulder especially in the young patient.

Mechanism

- Fall on outstretched arm

Neer classification 1970

Depends on displacement of one or more of the 4 major segments involve in those injuries; those are

1) The head.
2) The greater tuberosity.
3) The lesser tuberosity.
4) The shaft.
**Neer classification**

1) One part fracture = no displacement.
2) Two parts fractures = one segment separated.
3) Three parts fractures = two segments are separated.
4) Four parts fractures = all major segments are separated.

**Clinical features**

1) Pain not severe in impacted fractures.
2) Bruises and swelling.
3) Signs of axillary nerve or brachial plexus injury.
4) Limitation of movement.

**X-ray**

- Show the type of fracture according to Neer classification.

**Treatment**

Neer I: need only rest in sling 3-6 weeks followed by active exercise.

Neer II: close reduction by manipulation and sling for 6 weeks, if failed open reduction and internal fixation should be done.

Neer III: difficult to reduce it closely so open reduction and internal fixation is the treatment of choice.

Neer IV: open reduction and internal fixation or prosthetic replacement.

**Complications**

1) Shoulder dislocation.
2) Vascular and nerve injuries.
3) Shoulder stiffness.
4) Malunion.