#### **Role of Exercises**

Two types of exercises have been recommended for tennis elbow: Stretching and strengthening exercises.

- Above recommendations should be applied before exercises if pain is mild to moderate.
- As pain subsides the following exercises for tennis elbow should help you prevent or reduce future injury.
- You may do the stretching exercises right away.
- You may do the strengthening exercises when stretching is nearly painless.
- Stretching can be done daily. Strength should be done 2–3 times weekly.

## Stretching Exercises for Tennis Elbow

- Bend your wrist forward and backward as far as you can for 3 sets of 10.
- With uninjured hand, help to bend the injured wrist down by pressing the back of your hand and holding it down for 15 to 30 seconds. Next, stretch the hand back by pressing the fingers in a backward direction. Hold for 15 to 30 seconds and 3 sets. Keep your elbow straight during this exercise.
- With your elbow bent 90°, turn your palm upward and hold for 5 seconds. Slowly turn your palm downward and hold for 5 seconds. Keep elbow at your side and bent 90° throughout this exercise for 3 sets of 10.
- Gently bring your palm up toward your shoulder and bend your elbow as far as you can. Then straighten your elbow as far as you can for 3 sets, 10 times.
- The following exercises for tennis elbow should never be done when pain is moderate to acute

#### Mill's Maneuver

This is the final option before surgery. About 10 percent of the cases do not respond to conservative treatment. In them, a forceful extension of a fully flexed and pronated forearm after injection may be attempted. Non-traumatic Conditions of the Elbow 25



Fig. 1.12: Common flexor origin

#### **Relevant Anatomy**

- It is a tendinopathy of the insertion of the epitrochlear muscles [flexors of the fingers of the hand flexor carpi radialis (FCR) and pronators].
- The anterior forearm contains several muscles that are involved with flexing the fingers and thumb, and flexing and pronating the wrist.
- The tendons of these muscle come together in a common tendinous sheath, which is inserted into the medial epicondyle of the humerus at the elbow joint.
- In response to minor injury, or sometimes for no obvious reason at all, this point of insertion becomes inflamed.

Epitrocleitis is very similar to lateral epicondylitis (tennis elbow) but occurs on the medial side of the elbow, where the pronator teres and the flexors of the wrist and fingers originate. Tensing of these muscles by resisted wrist and finger flexion in pronation will provoke the pain (Fig. 1.12).

Tenderness is often less well localized than in tennis elbow (Figs 1.13A and B).

#### How is the fracture caused? Mechanism of Injury

Fall on an outstretched hand with hyperextension at the elbow with abduction or adduction, with hand dorsiflexed (Fig. 2.2).



Fig. 2.2: Fall on outstretched hands is a common mechanism of upper limb fractures in children

#### **Quick review of statistics**

- Age-first decade, 5-8 years, 84% cases < 10 years
- Sex—boys 63.6%
- Sides (L)-58.6%; (R)-42.4%
- Open fracture—2.3%
- Nerve injury—7% ——
- *VIC*—0.5%
- Fracture of ipsilateral Extremity—1.2%
- Flexion type—2.3%
- Extension type—97.7%
- Radial nerve—45%Median nerve—32%

#### Ulnar nerve-23%

- Fracture of children
- Not scary but spectacular
- It is a great teacher teaches you the values of basics in orthopedics
- It is kind and forgiving if you make a mistake (Cubitus varus), it forgives you (No functional impairment) but will not allow you to forget (Cosmetic disability)

Welcome to the world of supracondylar fractures

In its own humble way it teaches you the values of life!

#### What are the treatment methods? Management

# Treatment methods – Plenty of choices but do we know the right choice?

- Immobilization with a slab or cuff collar
- Closed reduction and Plaster cast
- Closed reduction and Percutaneous fixation with K-wires
- Traction Skin or Skeletal
- Open Reduction and Internal fixation



#### Conservative management:

- Initially, closed reduction is tried under general anesthesia by traction and counter traction methods (Figs 2.8A to C).
- The medial and lateral tilt is corrected first and posterior displacement next.
- An immediate check can be made whether the reduction has been successful by noting the long axis of the forearm and arm, which should be parallel.
- Any deviation from the normal indicates residual uncorrected deformities.
- Two to three attempts under the same anesthesia can be made and the elbow is immobilized in hyper flexion, as in this position the triceps acts as an internal splint (Figs 2.9A and B and 2.10) and the forearm is pronated as in this position the medial periosteal hinge closes the cortex laterally.

## Complications

These are broadly divided into two categories:

- 1. Those that cause functional impairment of the extremity and is more serious.
- 2. Those that produce only cosmetic sequelae.

#### Complications Causing Functional Impairment

*Neurological involvement:* Overall incidence is around 7 percent.

*Radial nerve:* Most commonly affected and is usually injured in posteromedial displacement.

Median nerve: Injured during posterior displacement.

Anterior interosseous nerve: Injury is seen in posterolateral displacement of the distal fragment.

*Ulnar nerve:* Injured in overhead skeletal traction and in flexion type of supracondylar fracture.

# Complications – Nerve injury mercifully do not require active interventions

*Vascular injury:* The incidence is between 0.5 and 1 percent. Common with extension type and is usually due to direct injury of brachial artery by the fracture. The other causes are internal thrombus, intimal tear, brachial artery spasm, external compression by proximal fracture fragment of the humerus, fracture hematoma, partial or complete rupture of brachial artery.