

## **FRACTURE OF A SINGLE FOREARM BONE**

Fracture of the radius alone is very rare and fracture of the ulna alone is uncommon. These injuries are usually caused by a direct blow – the ‘nightstick fracture’. They are important for two reasons:

- An associated dislocation may be undiagnosed; if only one forearm bone is broken along its shaft and there is displacement, then either the proximal or the distal radio-ulnar joint must be dislocated. The entire forearm, elbow and wrist should always be x-rayed.
- Non-union is liable to occur unless it is realized that one bone takes just as long to consolidate as two.

### **Clinical features**

Ulnar fractures are easily missed – even on x-ray. If there is local tenderness, a further x-ray a week or two later is wise.

### **Treatment**

***Isolated fracture of the ulna*** The fracture is rarely displaced; a forearm brace leaving the elbow free can be sufficient. However, it takes about 8 weeks before full activity can be resumed. Rigid internal fixation will allow earlier activity and avoids the risk of displacement or non-union.

***Isolated fracture of the radius*** Radius fractures are prone to rotary displacement. The position is sometimes difficult to hold in children and just about impossible in adults; if so, then internal fixation with a compression plate and screws in adults, and preferably intramedullary rods in children, is better.

***Middle/distal third fractures of the radius in children*** These are particularly unstable, being deformed by the pull of the thumb abductors and pronator quadratus. They can be treated with an above-elbow cast in supination but, failing that, fixation with an intramedullary rod, Kirschner (K-) wires or a plate is advisable.

## **MONTEGGIA FRACTURE DISLOCATION OF THE ULNA**

any fracture of the ulna associated with dislocation of the radio-capitellar joint, including trans-olecranon fractures in which the proximal radioulnar joint remains intact.

### **Clinical features**

The ulnar deformity is usually obvious but the dislocated head of radius is masked by swelling. A useful clue is pain and tenderness on the lateral side of the elbow. The wrist and hand should be examined for signs of injury to the radial nerve.

### **X-ray**

AP AND LAT the head of the radius(which normally points directly to the capitulum ) is dislocated forwards or backward, and there is a fracture of ulna.

### **Treatment**

The key to successful treatment is to restore the length of the fractured ulna;by fixed with a plate and screws; bone grafts may be added for safety. only then can the dislocated joint be fully reduced and remain stable.

### **Complications**

**Nerve injury** The lesion is usually a neurapraxia, which will recover by itself.

**Malunion** In children, no treatment is advised. In adults, osteotomy of the ulna or perhaps excision of the radial head may be needed.

**Non-union** of the ulna should be treated by plating and bone grafting.

**Special features in children .....**

## GALEAZZI FRACTURE-DISLOCATION OF THE RADIUS

The radius fractures in its lower third and the inferior radio-ulnar joint subluxates or dislocates.

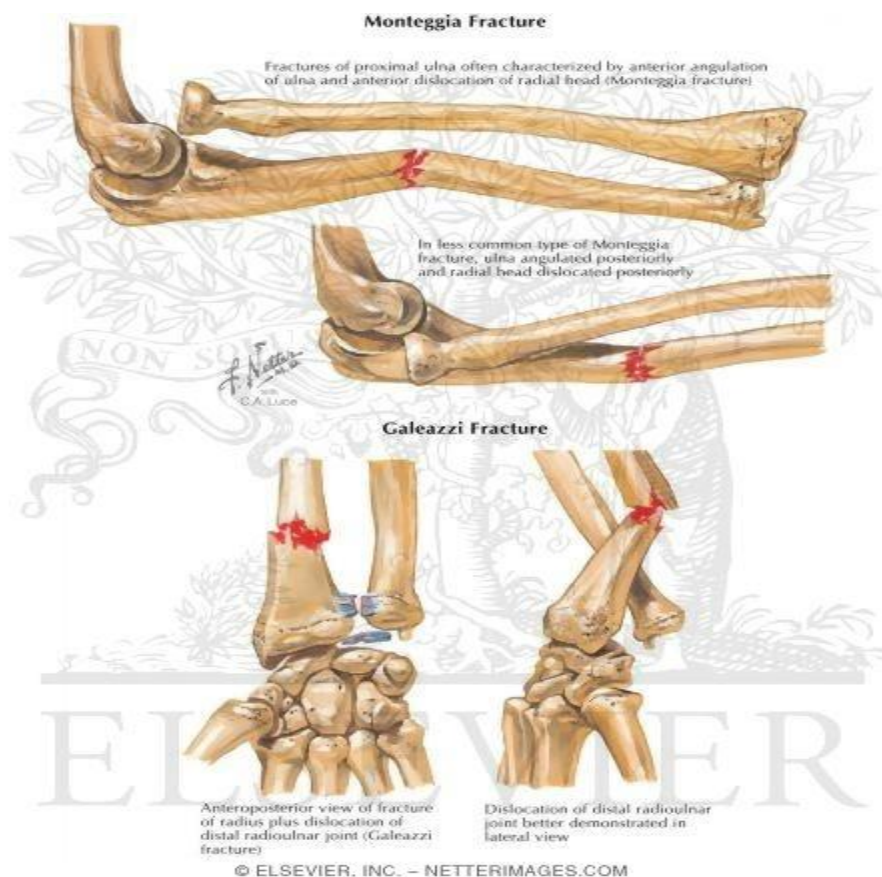
### Clinical features

The Galeazzi fracture is much more common than the Monteggia.

**X-ray** A transverse or short oblique fracture is seen in the lower third of the radius, with angulation or overlap. The distal radio-ulnar joint is subluxated or dislocated.

### Treatment

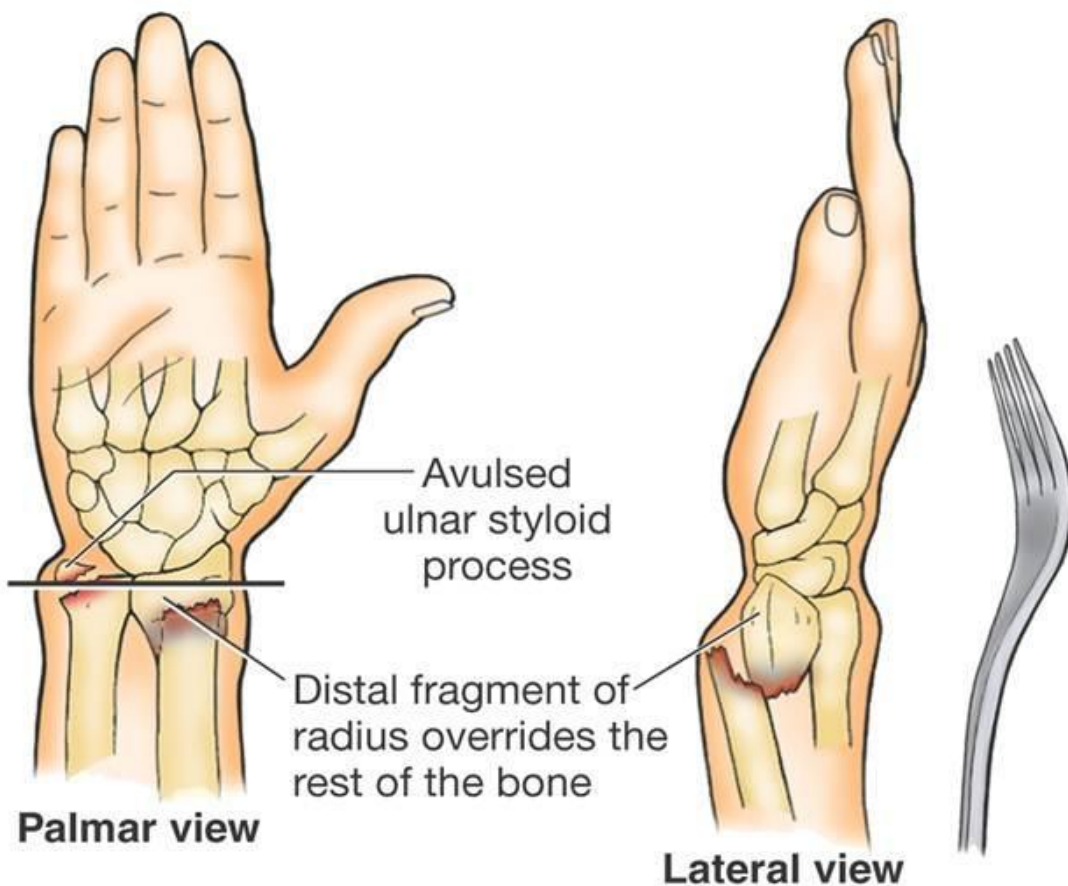
the important step is to restore the length of the fractured bone. In children, closed reduction is often successful; in adults, reduction is best achieved by open operation and compression plating of the radius. An x-ray is taken to ensure that the distal radio-ulnar joint is reduced.



## COLLES' FRACTURE

a transverse fracture of the radius just above the wrist, with dorsal displacement of the distal fragment. It is the most common of all fractures in older people, the high incidence being related to the onset of postmenopausal osteoporosis. Thus the patient is usually an older woman who gives a history of falling on her outstretched hand. by the 'dinner-fork' deformity .

**X-ray** There is a transverse fracture of the radius at the corticocancellous junction, and often the ulnar styloid process is broken off. The radial fragment is impacted into radial and backward tilt. Sometimes there is an intra-articular fracture; sometimes it is severely comminuted.



**Colles fracture of distal radius  
("dinner fork deformity")**

## **Treatment**

**UNDISPLACED FRACTURES** dorsal splint is applied for a day or two until the swelling has resolved, then the cast is completed. An x-ray is taken at 10–14 days to ensure that the fracture has not slipped; if it has, surgery may be required; if not, the cast can usually be removed after four weeks to allow mobilization.

**DISPLACED FRACTURES** reduced under anaesthesia The position is then checked by x-ray. If it is satisfactory, a dorsal plaster slab is applied, extending from just below the elbow to the metacarpal necks and two-thirds of the way round the circumference of the wrist. The fracture unites in about 6 weeks and, even in the absence of radiological proof of union, the slab may safely be discarded and exercises begun.

**IMPACTED OR COMMUNUTED** external fixator, volar locking plate

## **Complications**

### **EARLY**

**Circulatory problems** The circulation in the fingers must be checked

**Nerve injury** Direct injury is rare, but compression of the median nerve in the carpal tunnel is fairly common.

**Reflex sympathetic dystrophy** This condition is probably quite common, but fortunately it seldom progresses to the full-blown picture of Sudeck's atrophy.

### **TFCC injury (Triangular Fibrocartilage Complex)**

TFCC injury is more common than is generally appreciated. As the distal radius displaces dorsally, the TFCC is damaged; the ulnar styloid fracture which commonly accompanies a Colles' fracture illustrates the forces which are transmitted to the TFCC, which attaches in part to it.

### **LATE**

**Malunion ,Delayed union and non-union ,Stiffness ,**

**Tendon rupture** Rupture of extensor pollicis longus occasionally occurs a few weeks after.

## SMITH'S FRACTURE

the distal fragment is displaced anteriorly (which is why it is sometimes called a 'reversed Colles'). It is caused by a fall on the back of the hand.



### Clinical features

The patient presents with a wrist injury, but there is no dinner-fork deformity. Instead, there is a 'garden spade' deformity.

### Treatment

The fracture is reduced by traction, supination and extension of the wrist, and the forearm is immobilized in a cast for 6 weeks. X-rays should be taken at 7–10 days to ensure the fracture has not slipped. Unstable fractures should be fixed with percutaneous wires or a plate.

## FRACTURED SCAPHOID

Scaphoid fractures account for almost 75 per cent of all carpal fractures. The blood supply of the scaphoid diminishes proximally. This accounts for the fact that 1 per cent of distal third fractures, 20 per cent of middle third fractures and 40 per cent of proximal fractures result in non-union or avascular necrosis of the proximal fragment.



### **Clinical features**

The appearance may be deceptively normal, but the astute observer can usually detect fullness in the anatomical snuffbox

### **X-ray**

often a recent fracture shows only in the oblique view. It is very important to look for subtle signs of displacement or instability: e.g. obliquity of the fracture line, opening of the fracture line, angulation of the distal fragment and foreshortening of the scaphoid image.

A few weeks after the injury the fracture may be more obvious; if union is delayed, cavitation appears on either side of the break. Old, un-united fractures have 'hard' borders, making it seem as if there is an extra carpal bone. Relative sclerosis of the proximal fragment is pathognomonic of avascular necrosis.

### **Treatment**

**Undisplaced** fractures need no reduction and are treated in plaster; 90 per cent of waist fractures should heal. The cast is applied from the upper forearm to just short of the metacarpo-phalangeal joints of the fingers, 'glass-holding' position for 8 weeks.

**Displaced** fractures It is better to reduce the fracture openly and to fix it with a compression screw.

## **Complications**

***Avascular necrosis*** The proximal fragment may die, especially with proximal pole fractures, and then at 2–3 months it appears dense on x-ray.

***Non-union*** By 3 months it may be obvious that the fracture will not unite.

***Osteoarthritis*** Non-union or avascular necrosis may lead to secondary osteoarthritis of the wrist.