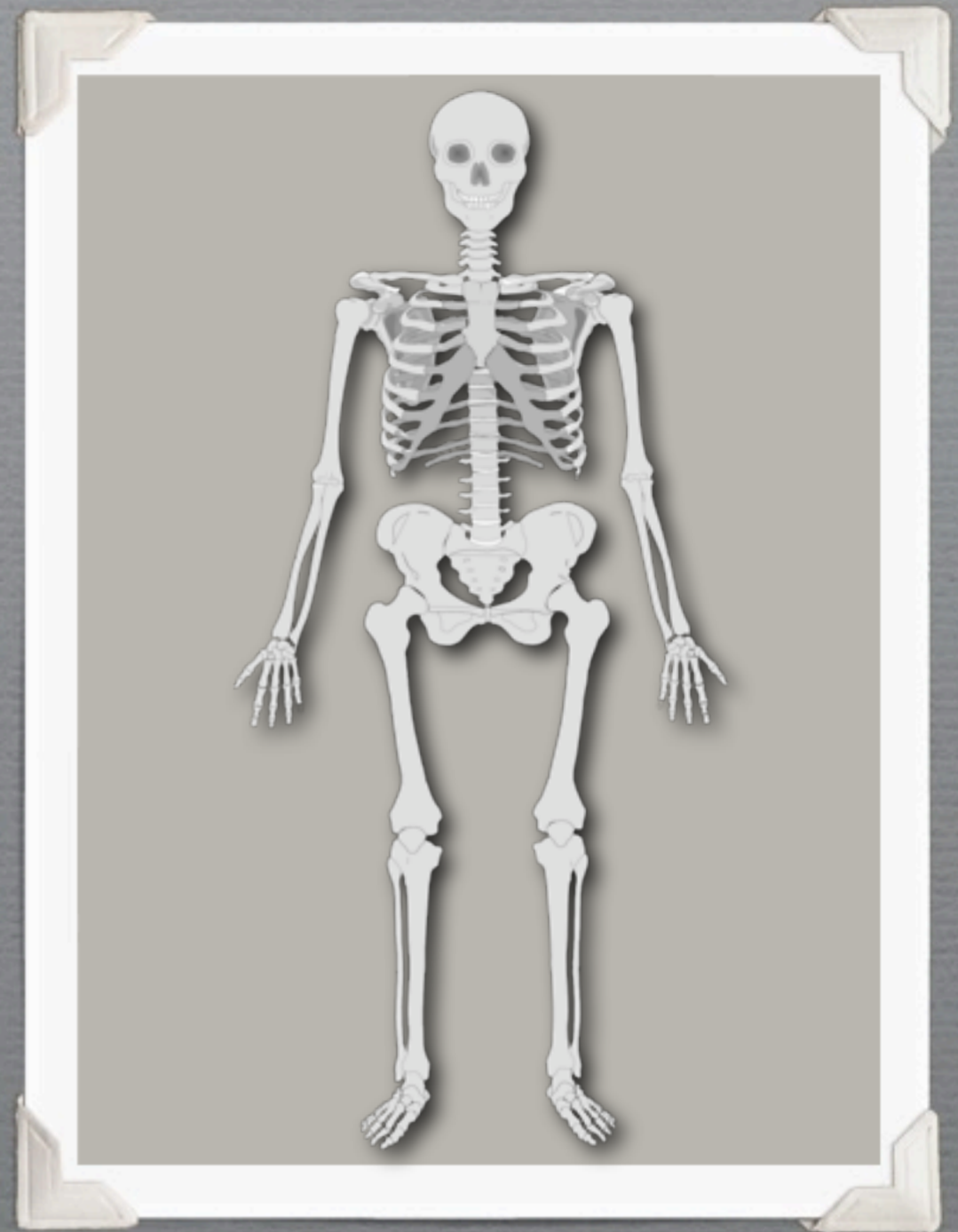


Common Skeletal Injuries
&
Orthopaedic problems
in Children
&
Their Management

Why?

- ♦ Common presentations to A&E
- ♦ Adventurous with little concept of consequences and reduced abilities/balance/strength.
- ♦ Soft bones so relatively more force required to fracture. Greenstick fractures more common. Specific injuries only seen in children.
- ♦ Epiphyseal plates make interpretation of x-rays difficult and can be injured. Can effect future growth.
- ♦ Emotional elements (fear, stranger anxiety) to consider.
- ♦ Non-accidental injury. Inadequate supervision.

Common Fractures



Saturday, 24 January 2009

KEY POINTS

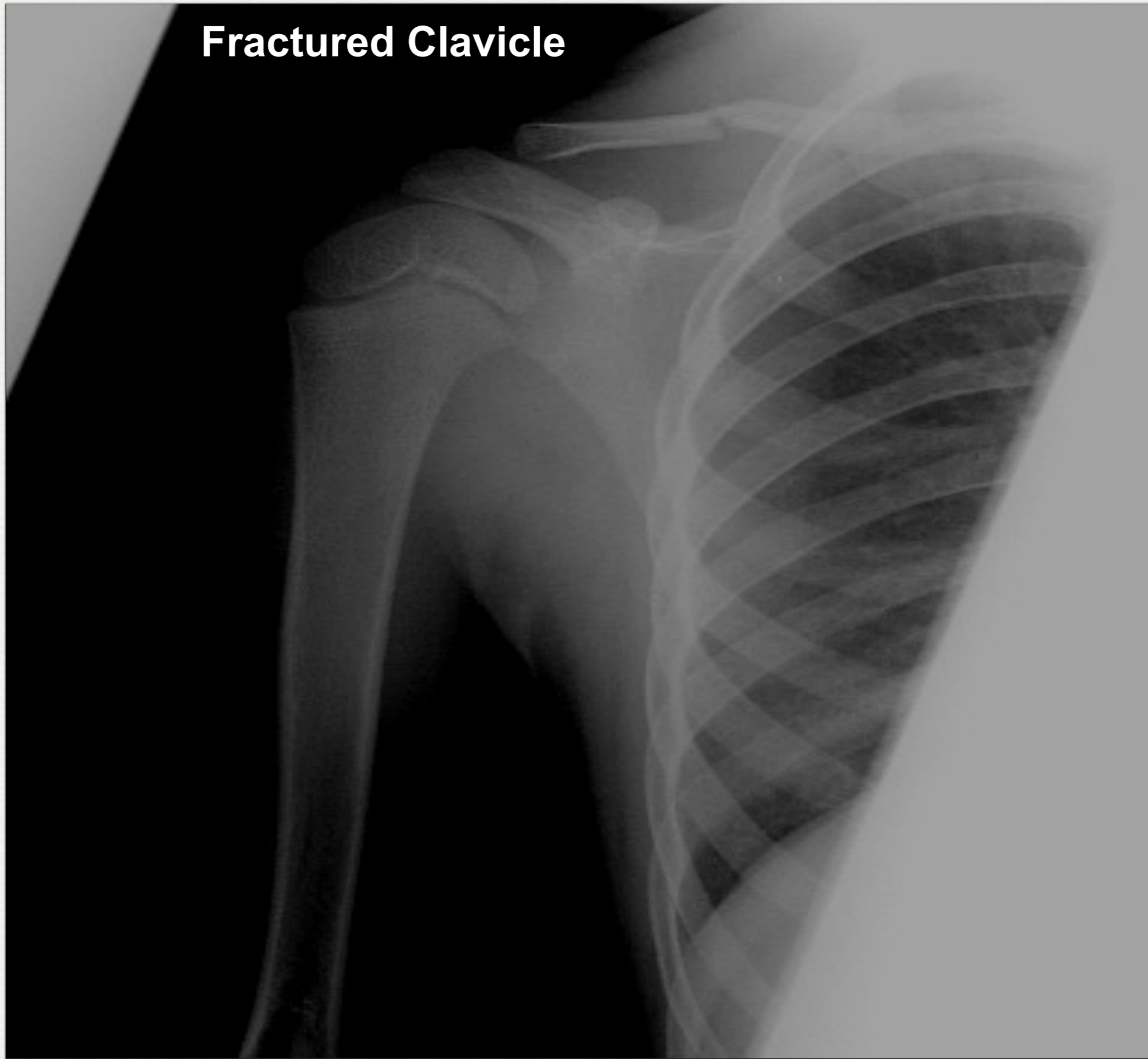
Children's injuries differ from adults. They are less likely to sprain a ligament and more likely to sustain a fracture. Radiographs should be taken more readily than in adults.

Injuries involving the growth plate must be treated carefully as later growth disturbance may occur.

Greater degree of fracture angulation can be tolerated in children compared to adults as growth will remodel the bone. Fractures in the proximal and distal ends of a long bone will remodel better compared to fracture in the mid shaft of a long bone which will remodel little.

A limping child is a common presentation and it is important to look for hip disorders which may be causing the limp.

Fractured Clavicle



Saturday, 24 January 2009

THE UPPER LIMB

Fracture of the Clavicle

Fall onto outstretched hand or direct blow to the shoulder

Pain on moving the arm

Tenderness over the clavicle \pm deformity

Treatment: Broad arm sling for 3weeks

Followed by mobilisation

Warn about lump over clavicle which may be prominent but will gradually diminish

Fractured Neck of Humerus



Saturday, 24 January 2009

Fracture of the Humerus

Fell onto outstretched hand or elbow or a direct blow to the arm

Pain on moving arm

Tender at the fracture site/bruising to the arm

Fracture may be at the neck or in the shaft

In shaft fracture assess radial nerve. Check for wrist drop

Treatment is with collar and cuff support

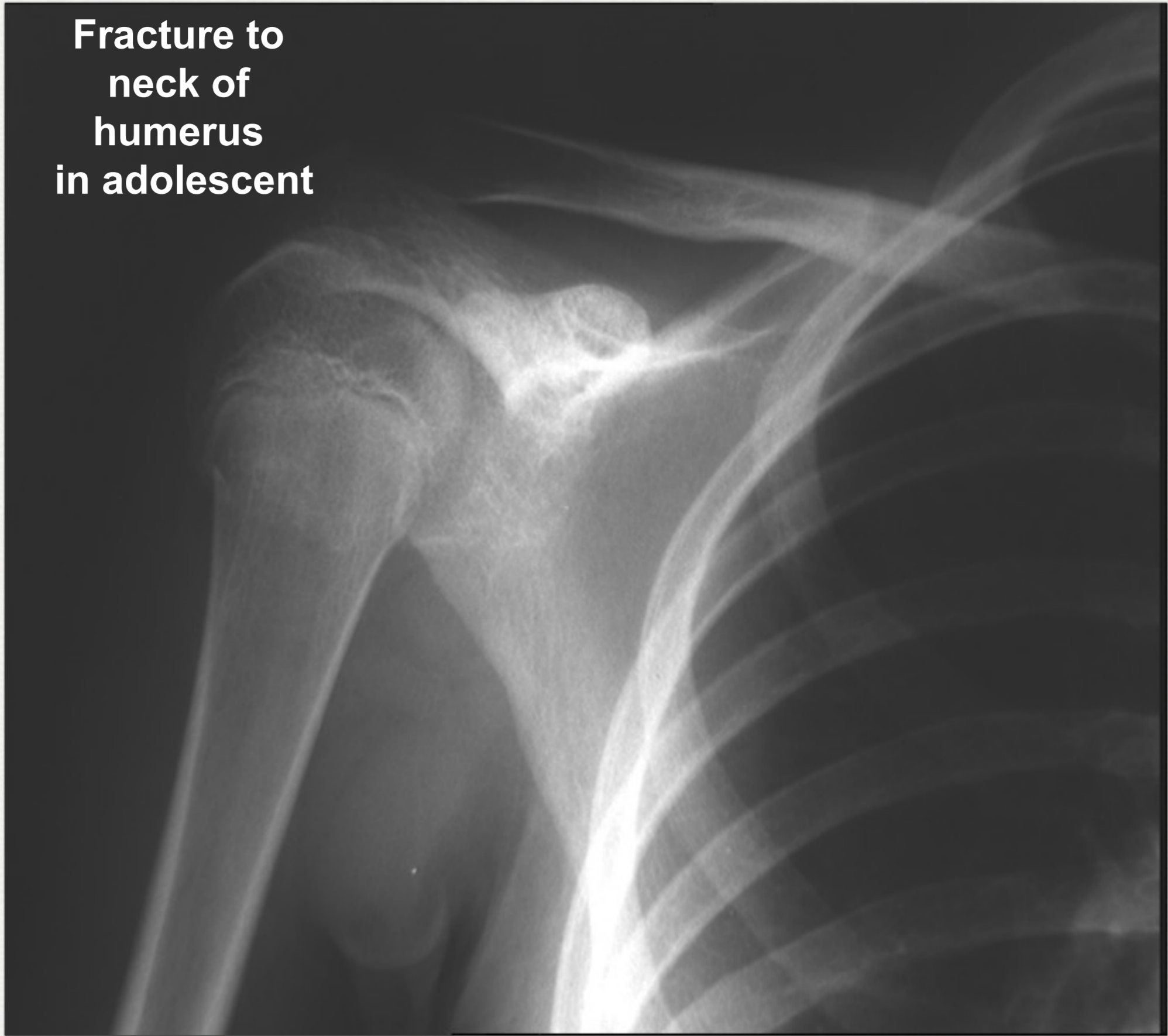
A fracture shaft of humerus may occasionally be placed in a U slab of plaster of Paris for support

Very rarely operative intervention

Humeral fractures take about 6 weeks to heal

If the radial nerve is damaged, all that is needed is a wrist splint as recovery generally occurs

**Fracture to
neck of
humerus
in adolescent**



Fractured Surgical Neck in Teenager



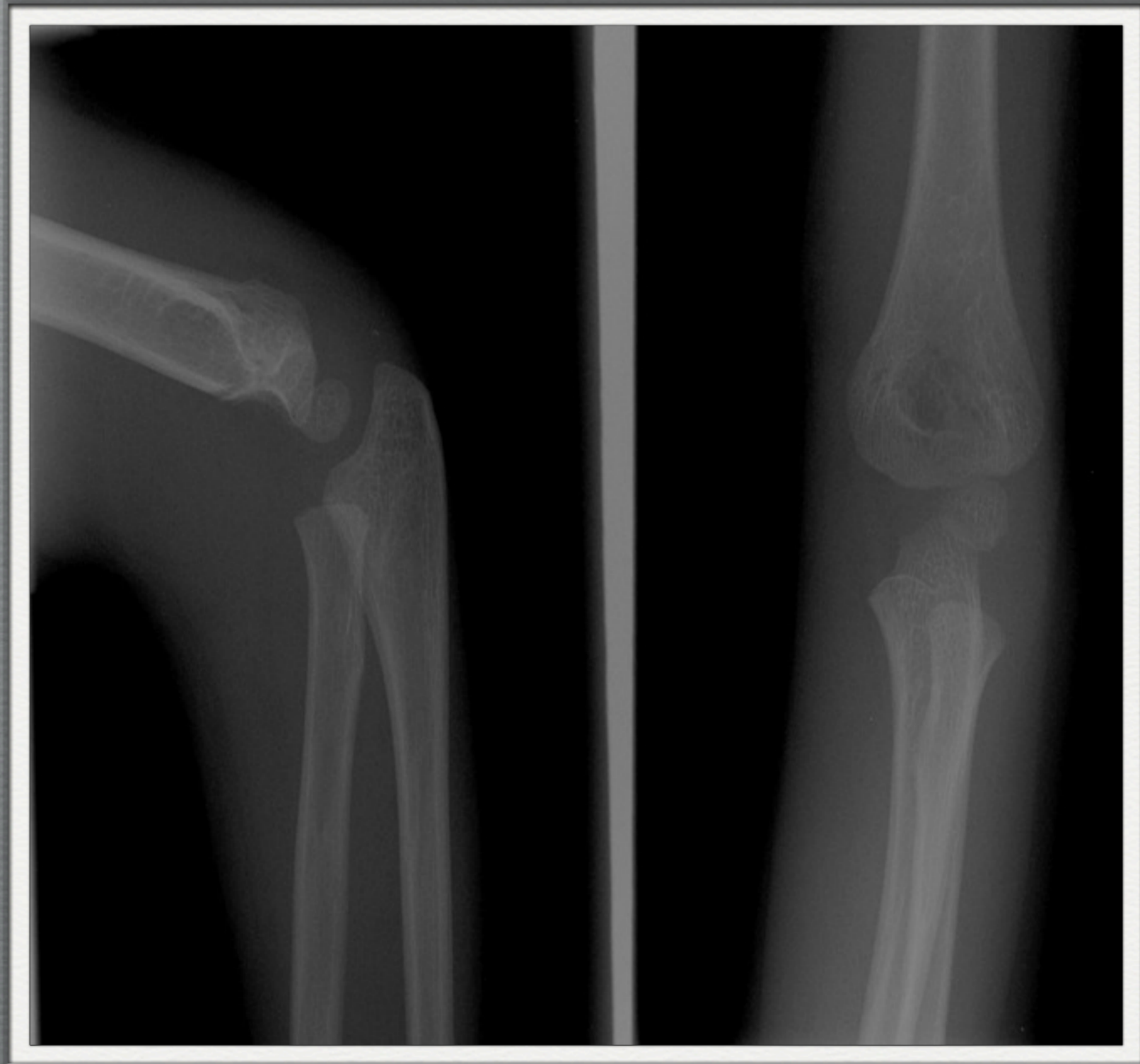
Saturday, 24 January 2009

**Displaced fractured humerus
in 5yr old**



Saturday, 24 January 2009

Supra- condylar Fracture



Saturday, 24 January 2009

Elbow

Supracondylar fracture

Fall onto the hand with the elbow bent

Elbow swollen and tender with pain on any attempted movement

May be displaced or undisplaced

If displaced the displacement is backwards

Always check the radial pulse – damage or kinking (spasm) of the brachial artery may occur with displaced fractures. If the radial pulse is absent urgent manipulation is needed to prevent ischaemia to the limb

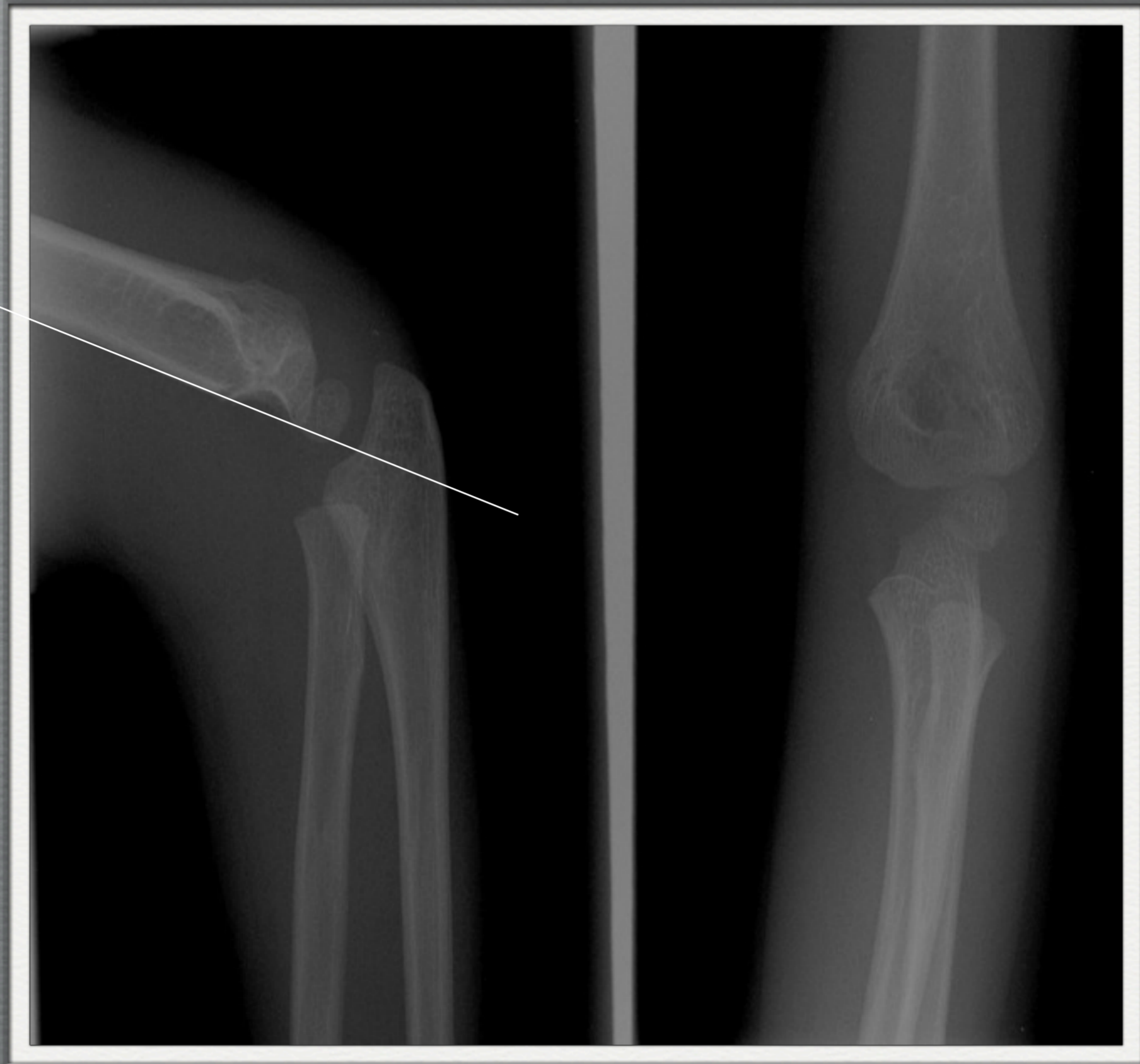
The child should always be referred to the orthopaedic surgeon

Displaced fractures will require manipulation and above elbow cast. K wiring may be needed in unstable cases after manipulation

If undisplaced the arm is immobilised in a collar and cuff

? admission for undisplaced fracture

Supra- condylar Fracture



Saturday, 24 January 2009

Elbow

Supracondylar fracture

Fall onto the hand with the elbow bent

Elbow swollen and tender with pain on any attempted movement

May be displaced or undisplaced

If displaced the displacement is backwards

Always check the radial pulse – damage or kinking (spasm) of the brachial artery may occur with displaced fractures. If the radial pulse is absent urgent manipulation is needed to prevent ischaemia to the limb

The child should always be referred to the orthopaedic surgeon

Displaced fractures will require manipulation and above elbow cast. K wiring may be needed in unstable cases after manipulation

If undisplaced the arm is immobilised in a collar and cuff

? admission for undisplaced fracture

Common Treatments

- Collar And Cuff
- Broad Arm Sling
- Back slab
- Analgesia

Supra-condylar displaced



Avulsion Fracture Medial Epicondyle



Saturday, 24 January 2009

Fracture/separation of the Medial Epicondyle

Medial epicondyle appears at 5 years of age and unites with the distal end of the humerus at 16 year of age

Fall onto the hand

Pain/swelling/reduced movements of the elbow

Treat in collar/cuff. If significant separation, will require manipulation and immobilisation in an above elbow cast

Caution: medial epicondyle may be in the joint following separation

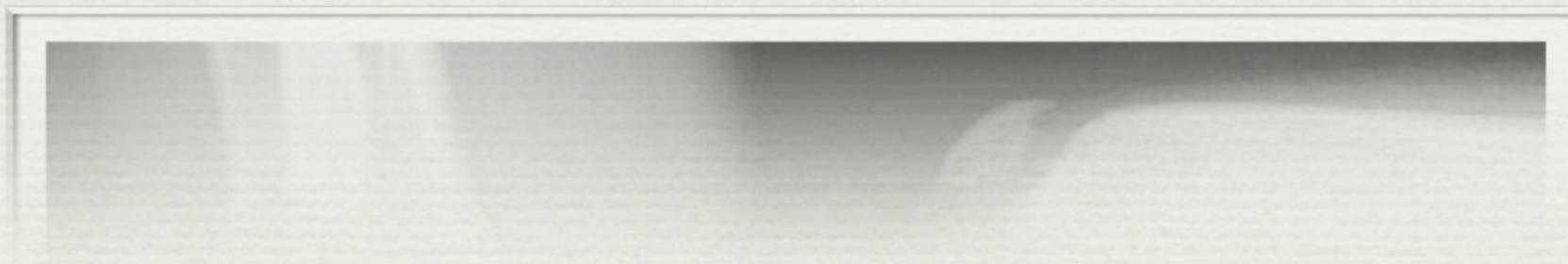
Common Treatments

-  Back Slab POP
-  MUA
-  MUA & K-Wires

CRITOE

Epiphyseal Growth Centres appearance by age

- ◆ Capitellum-6/12
- ◆ Radial head-5y
- ◆ Internal epicond-6y
- ◆ Trochlear-10y
- ◆ Olecranon-11y
- ◆ External epicond-12y



CRITOE

Epiphyseal Growth Centres appearance by age

- ◆ Capitellum-6/12
- ◆ Radial head-5y
- ◆ Internal epicond-6y
- ◆ Trochlear-10y
- ◆ Olecranon-11y
- ◆ External epicond-12y





Saturday, 24 January 2009

Fracture of the Head and Neck of the Radius

Fall onto the outstretched hand

Tenderness lateral side of the elbow

Pain on pronation/supination of elbow

The majority treated with collar/cuff

If head of radius is tilted by more than 15 degrees or if there is a large displaced fragment, manipulation and immobilisation in a plaster of Paris cast is needed

Isolated Radial Head Dislocation

Easily missed

Relatively trivial injury

Treatment: manipulation under anaesthesia

Collar and cuff



Saturday, 24 January 2009

Fracture of the Head and Neck of the Radius

Fall onto the outstretched hand

Tenderness lateral side of the elbow

Pain on pronation/supination of elbow

The majority treated with collar/cuff

If head of radius is tilted by more than 15 degrees or if there is a large displaced fragment, manipulation and immobilisation in a plaster of Paris cast is needed

Isolated Radial Head Dislocation

Easily missed

Relatively trivial injury

Treatment: manipulation under anaesthesia

Collar and cuff

Fracture radial Neck



Saturday, 24 January 2009

Fractured Olecranon



Saturday, 24 January 2009

Fracture of the Olecranon

Fall onto the elbow

Undisplaced or displaced

Treatment: if displaced MUA/internal fixation

if undisplaced – above elbow back slab



Pulled Elbow

Saturday, 24 January 2009

Pulled Elbow

Seen up to the age of 5 years

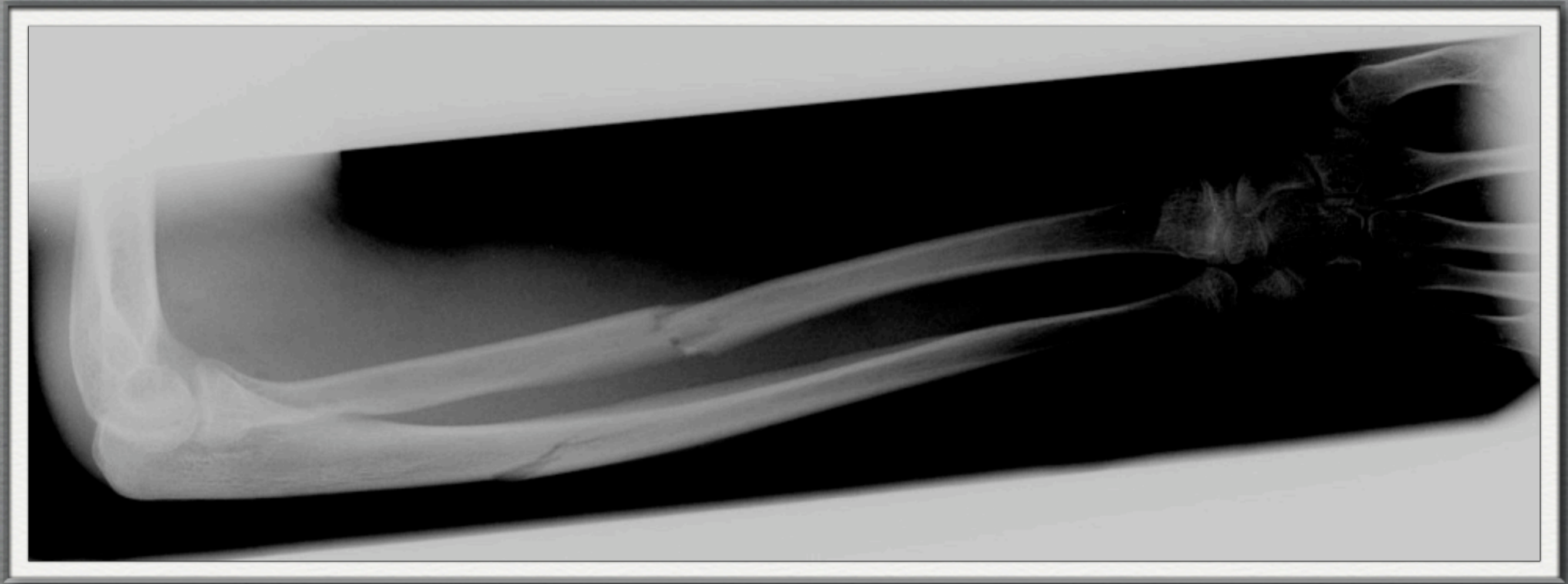
Subluxation of the radial head through the annular ligament

History is specific, child pulled by the arm

Treat with gentle manipulation. No immobilisation is needed after manipulation

The arm need not be Xrayed unless there is any doubt about a possible fall

Fractured Radius & Ulna



Saturday, 24 January 2009

Forearm Fracture

Combined shaft radius/ulna fractures

Treatment:

if displaced – manipulation otherwise above elbow plaster of Paris cast

Fractured Radius and Ulna

97LD26466
01-08-1988,F



Greenstick Fracture



Saturday, 24 January 2009

Greenstick Fracture of the Distal Radius

Very common

Fall on the outstretched hand

Symptoms may be minimal

Tenderness on palpation and movements are often reduced

The majority are treated with a backslab

A small proportion requires manipulation due to angulation followed by immobilisation in a plaster of Paris cast



Buckle Fracture wrist





'Colles Fracture' in Adolescent

Saturday, 24 January 2009

Displaced Fracture Distal Radius (Juvenile Colles Fracture)

Seen in adolescents

Requires manipulation under anaesthesia and plaster of Paris

Greenstick base of Proximal Phalynx



Saturday, 24 January 2009

Fracture Phalanges

Often seen in ball sports

The majority are simple fractures treated by neighbour strapping for 7 – 10 days



Back Slab



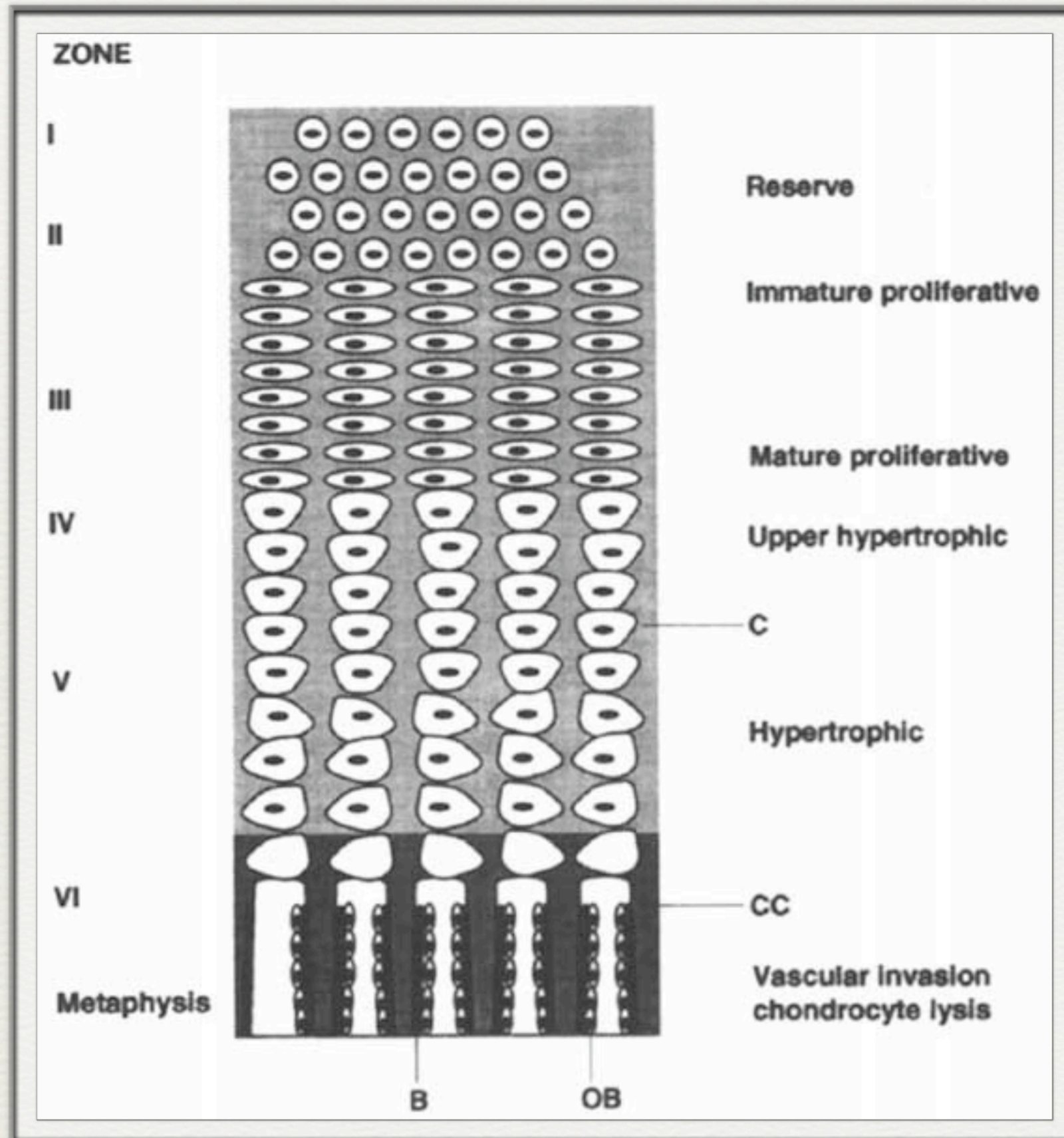
MUA

Epiphyseal Fracture Base of Proximal Phalanx

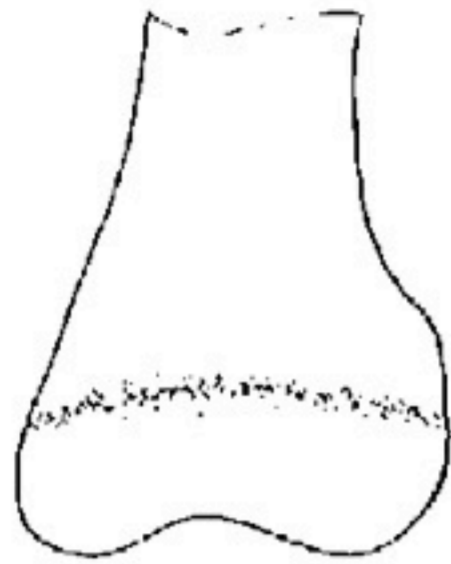
97L020500
30-03-1983,M



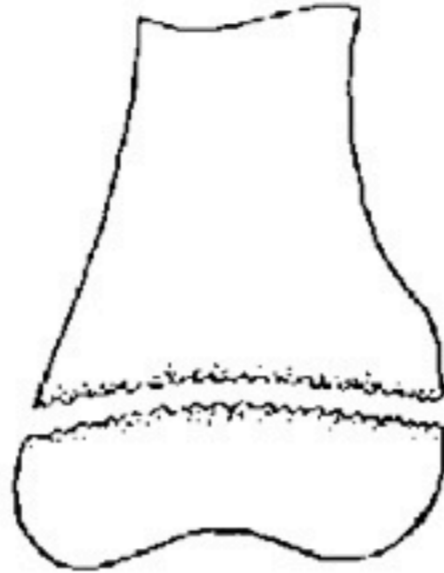
Saturday, 24 January 2009



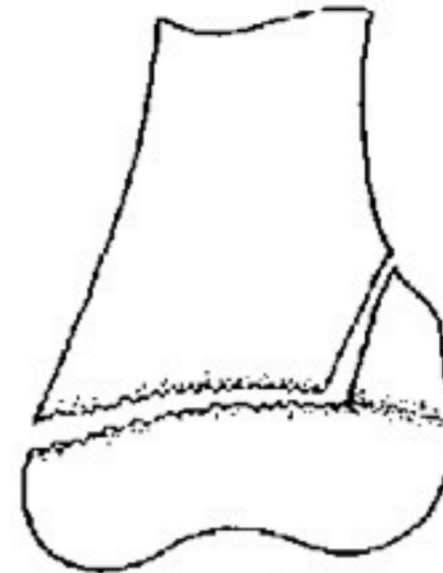
Salter-Harris Classification



Normal

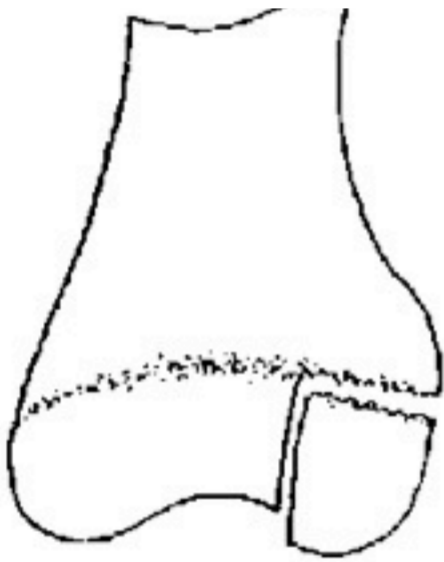


Type I

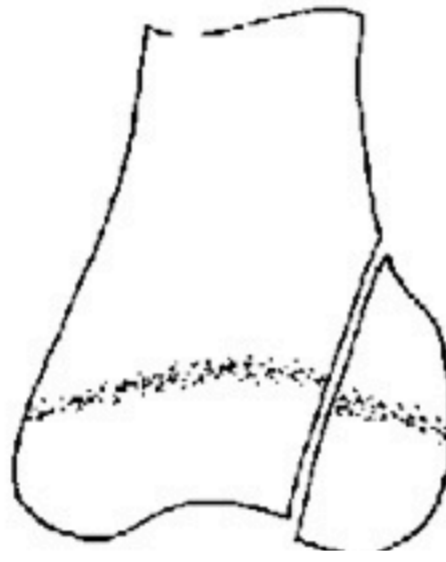


Type II

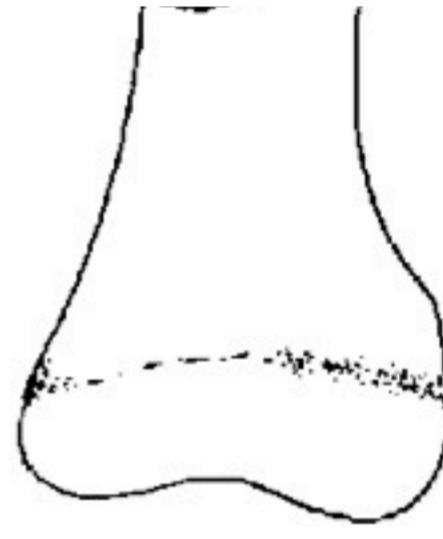
Type II



Type III



Type IV



Type V

Harris classification of epiphyseal fractures in childhood.

Saturday, 24 January 2009

GROWTH PLATE FRACTURES IN CHILDHOOD

The growth plate is a cartilaginous disc between the epiphysis and metaphysis
Fractures in this area are classified according to the Salter Harris classification
The commonest injury is type 2

Salter-Harris Type 2



Saturday, 24 January 2009

Type 2

The line of fracture travels through the plate and detach a metaphyseal fragment

The majority are treated conservatively by immobilisation

A minority require manipulation to restore anatomical alignment. Growth plate mal-alignment will result in premature fusion

Salter-Harris Type 2 - post manipulation



Saturday, 24 January 2009



**Displaced medial malleolar
fracture in
a child**

Painful Hip In Absence of Trauma



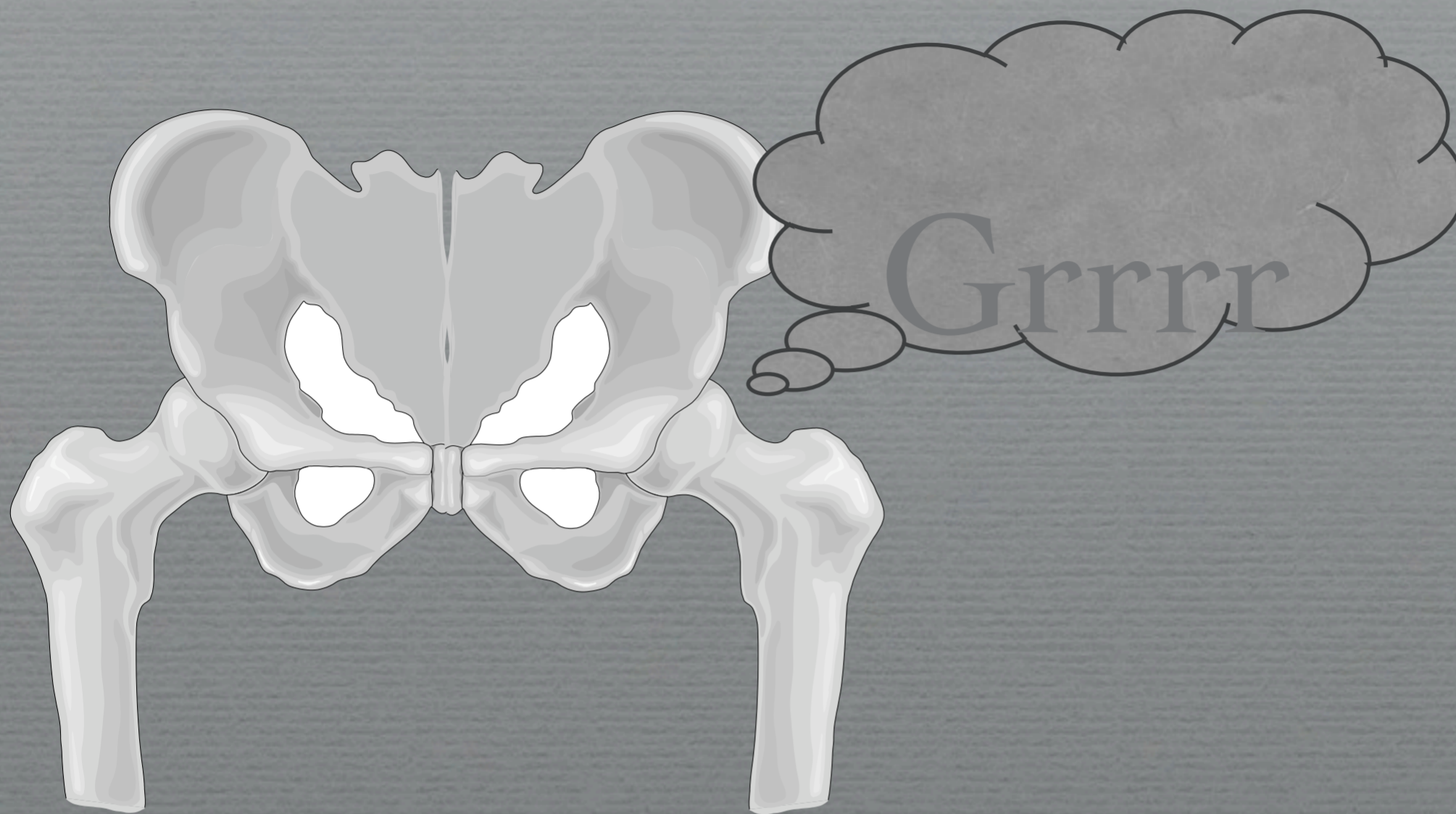
Saturday, 24 January 2009

Painful Hip in the Absence of Trauma

Children complaining of hip pain are the commonest cause of paediatric orthopaedic admissions in the UK

The child present with a limp

The patient's age will give some idea as to the most likely cause of the hip pain, though there is an overlap within the various age groups



Irritable Hip

Saturday, 24 January 2009

Irritable Hip

Occur in both sexes throughout childhood

Seen mainly under the age of 5 years

Child presents with a limp

Typically there is a history of a viral illness 2 –3 weeks prior to the limp

Hip movements are normal, but there may be minor limitation of rotation

Plan: Xrays - normal
Ultrasound scan will show an effusion

Treatment: Rest the limb

The child may need admission, some times traction used

Perthes disease
right hip



Saturday, 24 January 2009

Perthes Disease

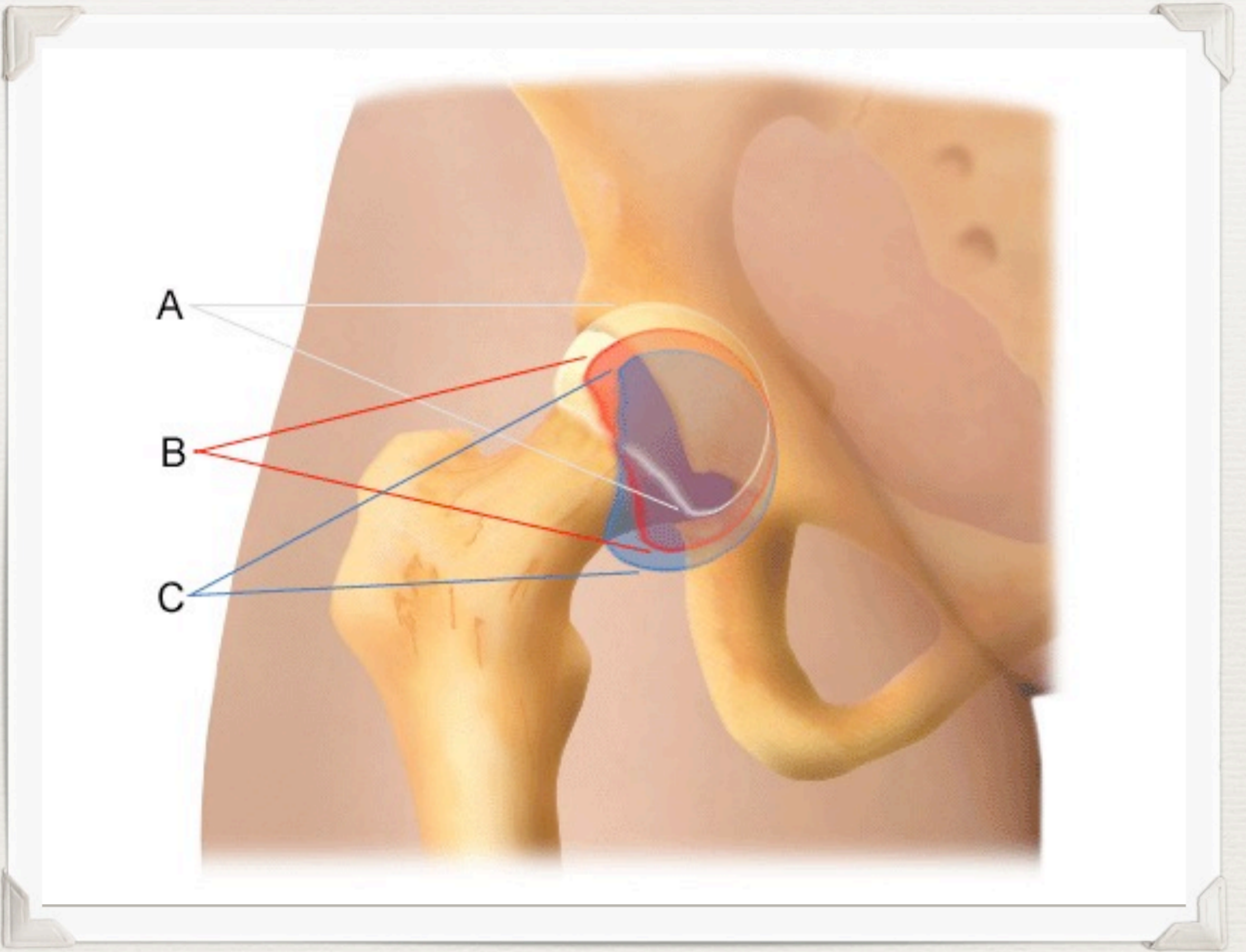
More common in boys

Typical age group 5 years – 10 years

Tends to be rare after the age of 7 years

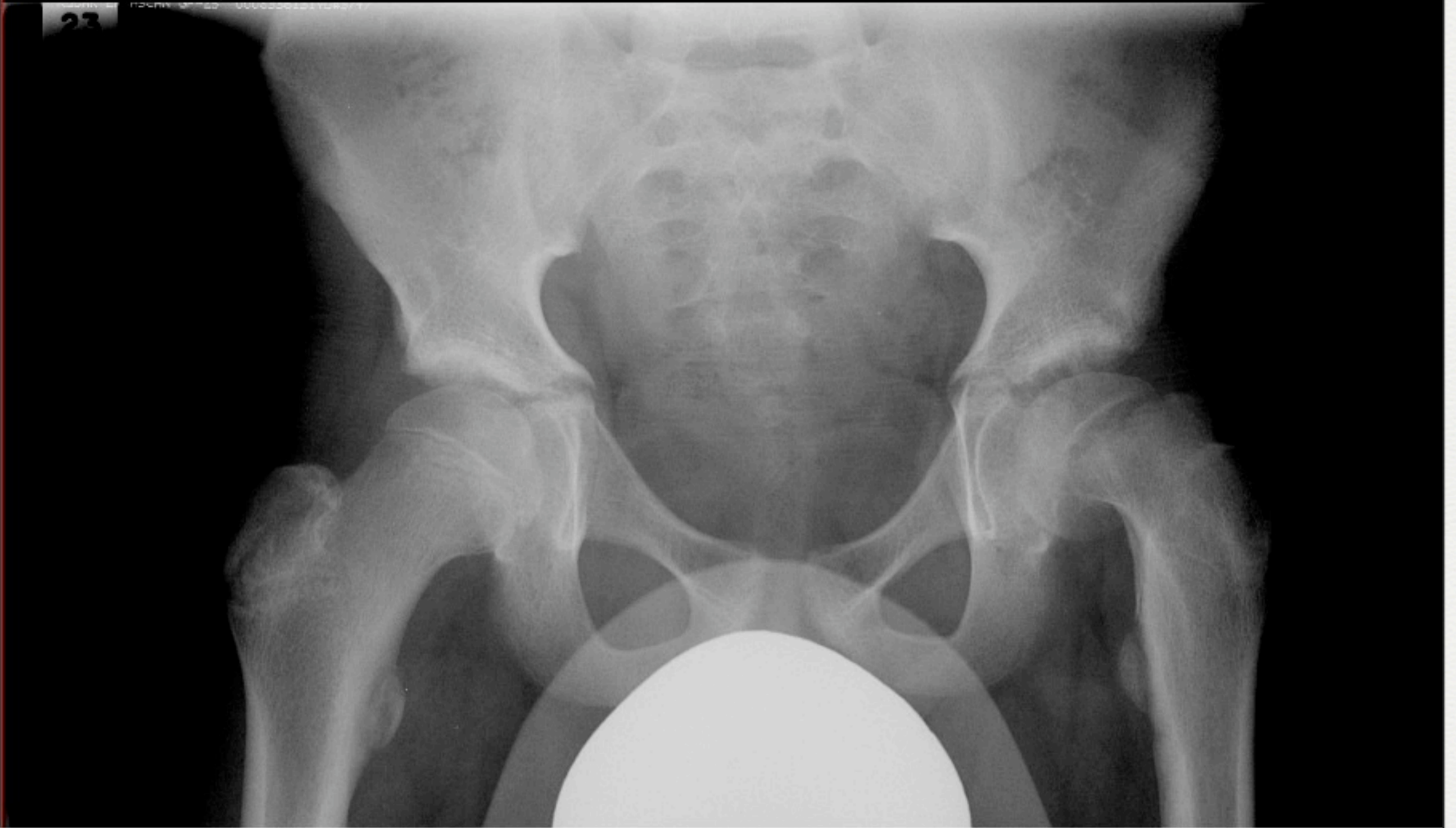
Abduction and internal rotation are reduced

Treatment: the child should be referred to the
Orthopaedic department



Slipped Upper Femoral Epiphysis (SUFE)

97L039325
25-02-1983,M



Saturday, 24 January 2009

Slipped Upper Femoral Epiphysis

More common in boys

Typically between 10 – 15 years of age

Rare under the age of 8 years

Reduction in abduction and internal rotation

Treatment: refer to the Orthopaedic department

Spiral Fracture



Saturday, 24 January 2009

LOWER LIMBS

Fracture of the Tibia

Twisting force applied to the leg while the foot is stationary

Spiral or transverse

Treated with plaster of Paris cast (above or below knee depending on site of fracture)





Saturday, 24 January 2009