Common diseases in Pediatric Orthopaedics

Common diseases in Pediatric Orthopaedics

- Developmental dysplasia of the hip
- Angular deformity of the knee (Genu varus/Genu valgus)
- Osgood Schlatter disease
- Growing pain
- Clubfoot
- Scoliosis
- Legg-Calve-Perthes disease

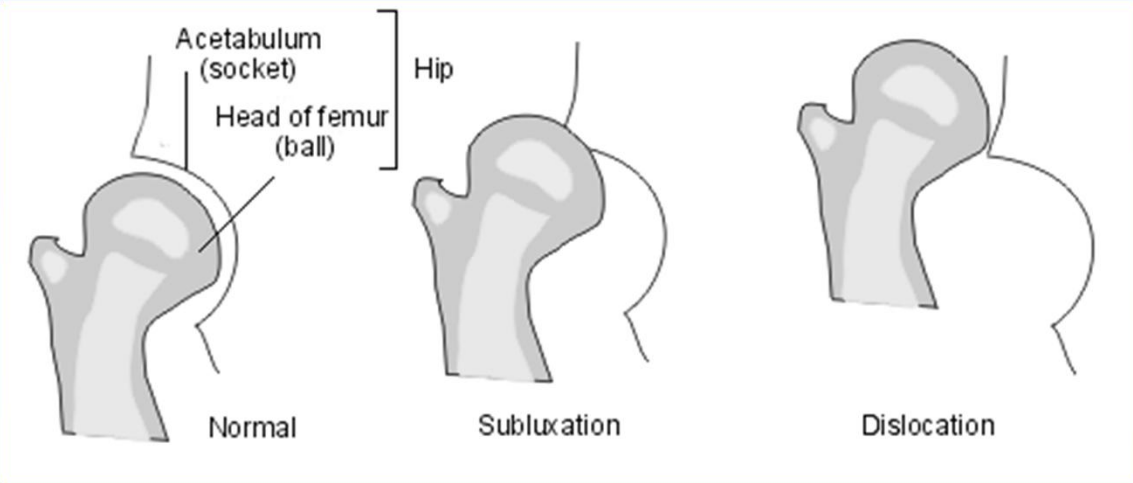
Case 1

Developmental Dysplasia of the Hip

DDH : spectrum of abnormalities involving the growing hip varying from dysplasia to subluxation or dislocation

- Congenital dislocation of hip (CDH)
  - dysplasia : abnormal development of tissues, organs
  - dislocation : complete displacement of joint relationship
  - subluxation : incomplete dislocation

Term : - dislocated
- dislocatable
- subluxatable



Developmental Dysplasia of the Hip

Incidence: 1:1,000 (USA) (dislocated)

10: 1,000 in American Indians

Female: Male = 4-6 : 1

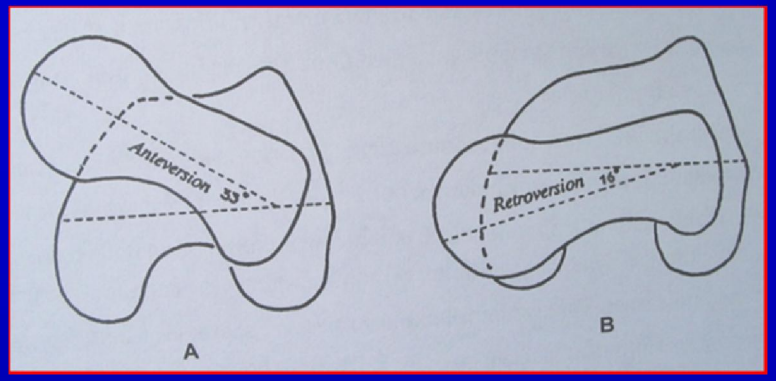
Left > Rt. , Bilateral 20%

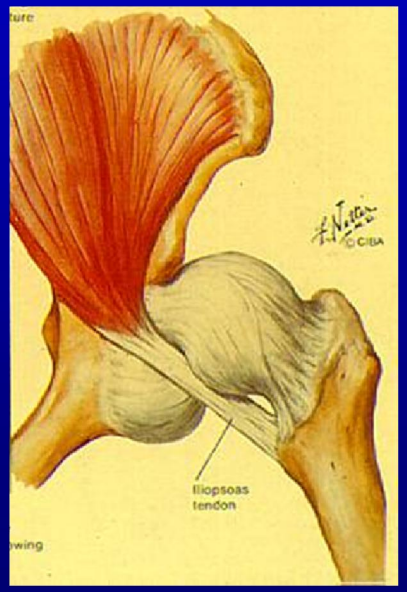
Etiology: Ligament laxity (hormone)

Developmental Dysplasia of the Hip

Pathoanatomy:

- Acetabular dysplasia
- Excessive femoral anteversion
- Soft tissues contracture:
  - hip capsule
  - transverse acetabular ligament
  - iliopsoas tendon





Developmental Dysplasia of the Hip

Risk factors:

- Race
- Family history
- Female
- First-born child, Breech presentation
- Oligohydramnios
- Torticollis
- Deformities of foot
  - metatarsus adductus
  - clubfoot
  - calcaneovalgus foot

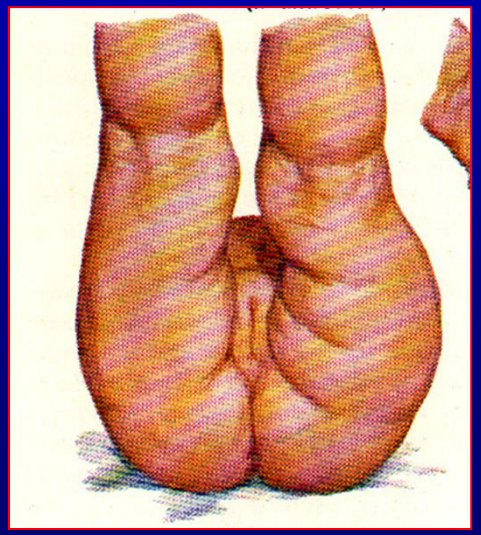
Developmental Dysplasia of the Hip

Physical exam :

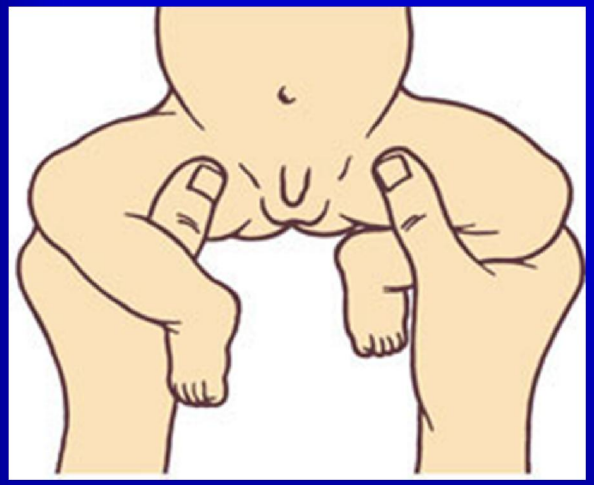
Neonates

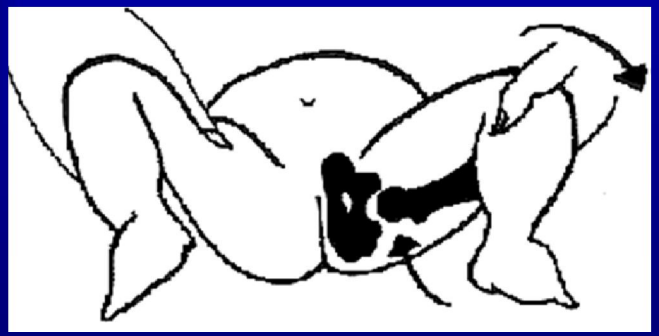
- asymmetrical thigh, inguinal folds
- Galeazzi sign
- Ortolani & Barlow test (+ve)

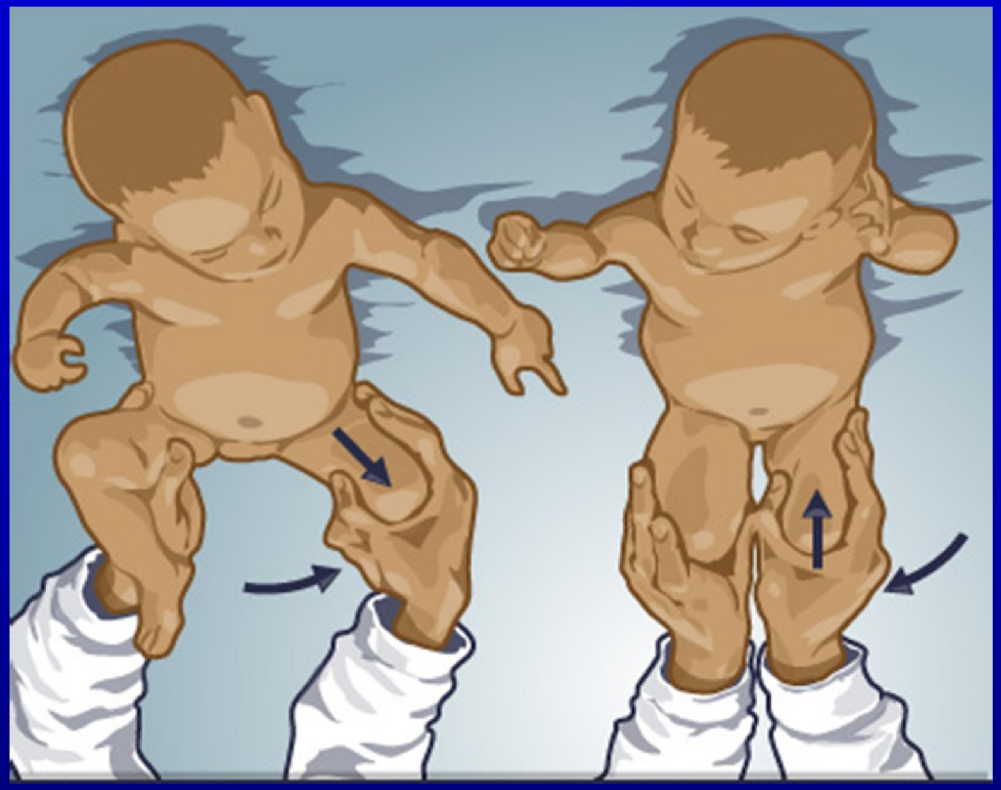
Galeazzi sign



Developmental Dysplasia of the Hip







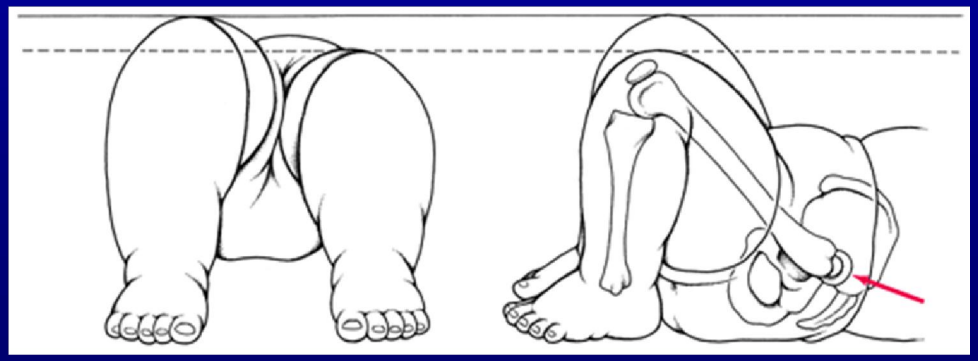
Ortolani's test

Barlow's test

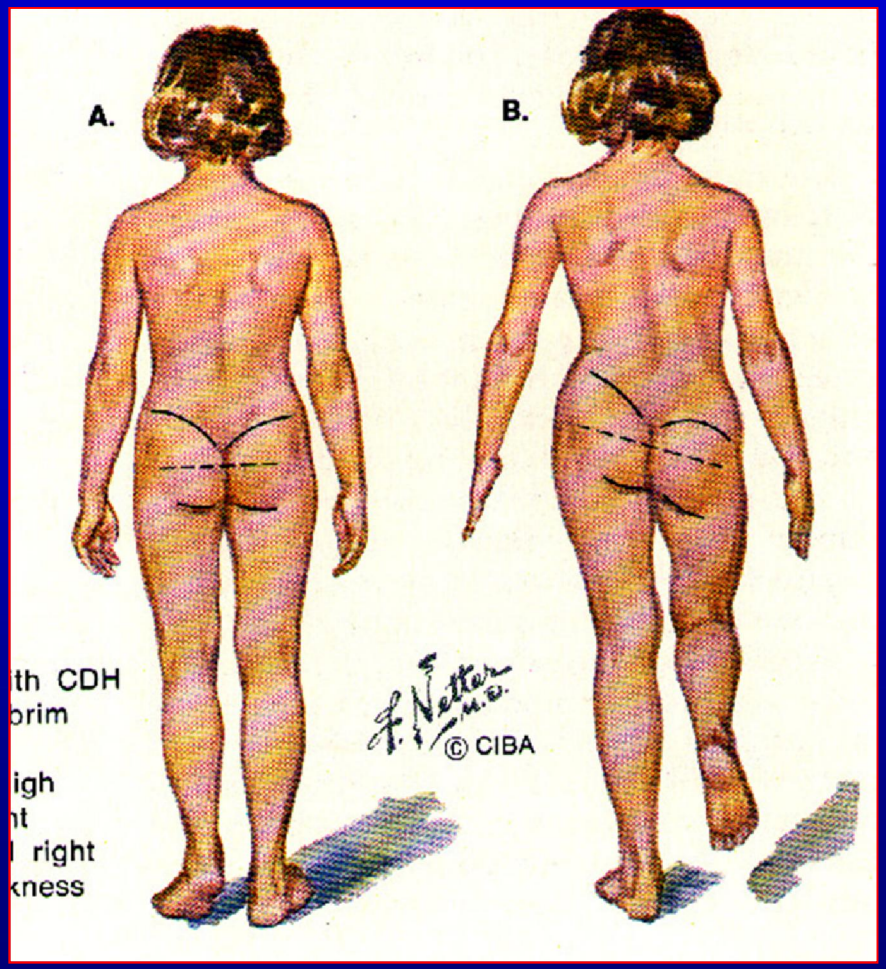
Developmental Dysplasia of the Hip

Age 4-6 months

- limit abduction
- Galeazzi sign



Developmental Dysplasia of the Hip



Walking age:

Limping gait

Trendelenburg gait

Trendelenburg's test (+ve)

Trendelenburg Test:

- downward pelvic tilt away from the affected hip during the stance phase and trunk shift toward the affected side
- Weakness of gluteus medius m.
- DDH, Perthes disease

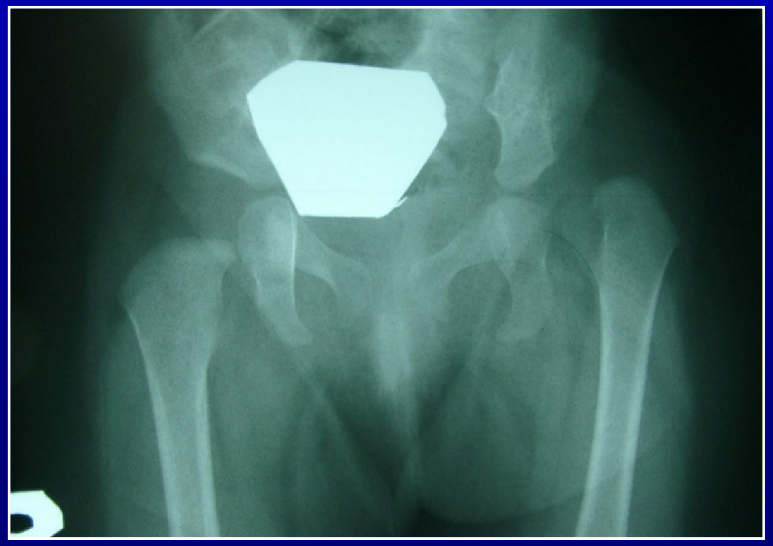
Developmental Dysplasia of the Hip

Investigation:

Ultrasound : investigation of choice for newborns

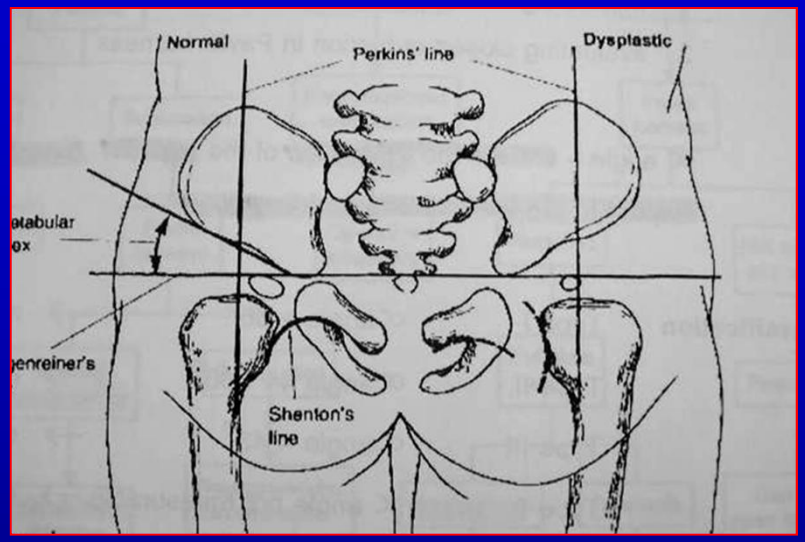
Plain films (both hips AP, frog leg views):

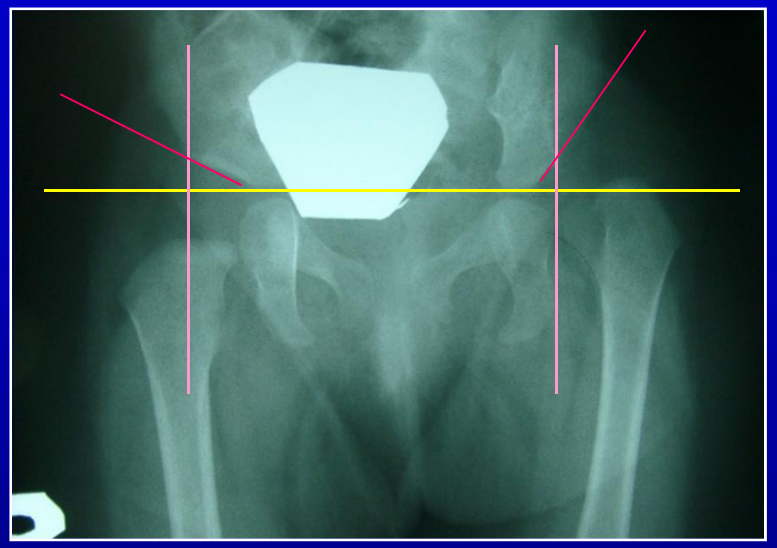
can diagnose DDH for infants older 3-6 months



Developmental Dysplasia of the Hip

Radiography :

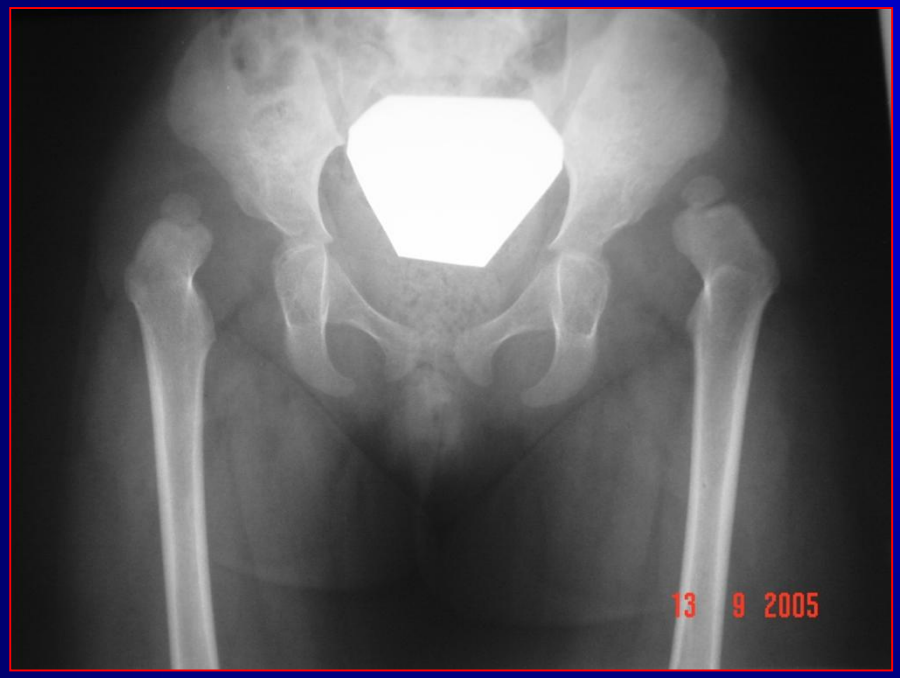


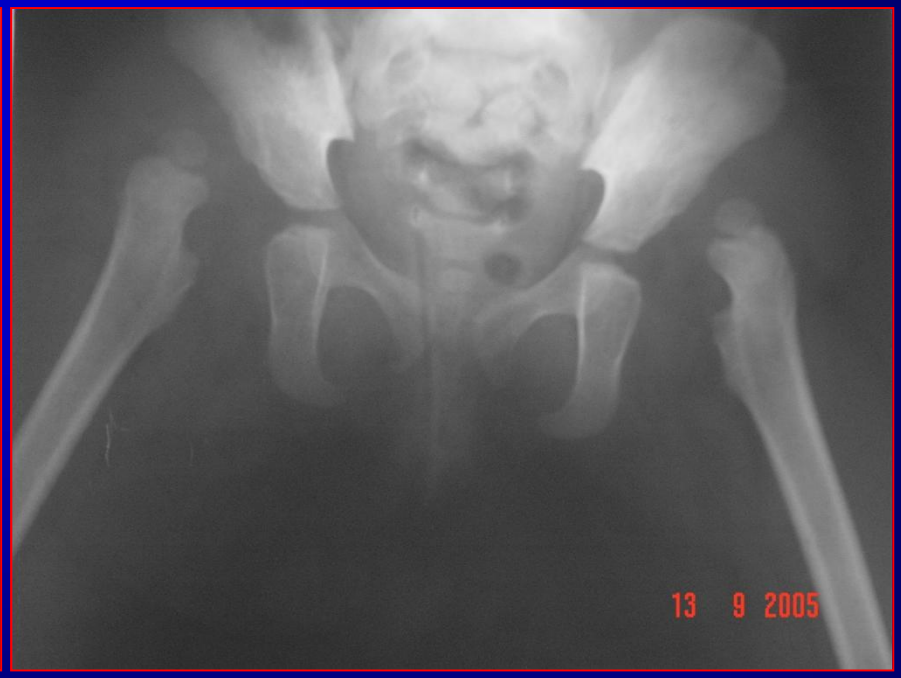


Delayed ossific nucleus
Hilgenliner's line (Horizontal line)
Perkin's line (Vertical line)
Acetabular index

Developmental Dysplasia of the Hip

Radiography : shenton's line break





Developmental Dysplasia of the Hip

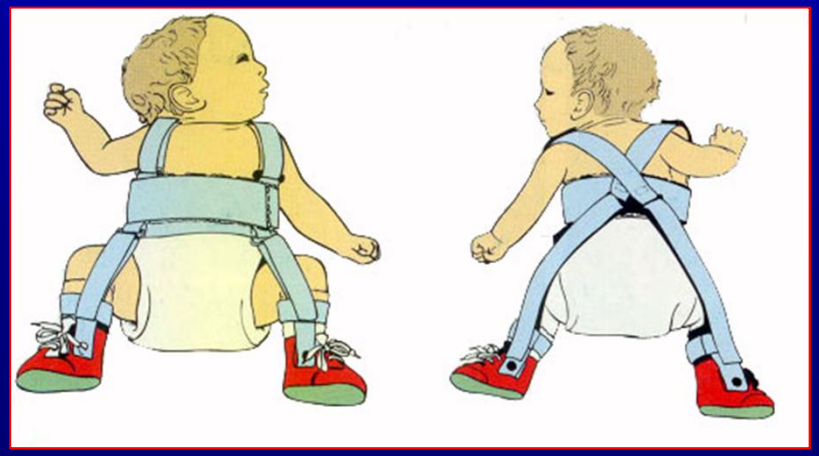
Goal of treatment:

- early reduction

- stable, concentric reduction of hip joint

Treatment : depend on age of detection

birth – 6 mo ⟶ Pavlik harness, hip spica cast



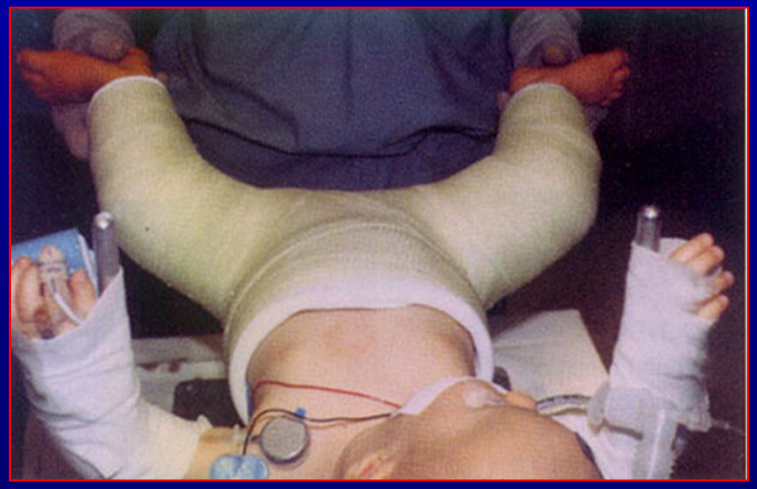
Developmental Dysplasia of the Hip

Treatment : depend on age of detection

6 – 18 mo ⟶ closed reduction + hip spica cast
(open reduction + hip spica cast)

18 – 48 mo ⟶ closed or open treatment
+ adductor tenotomy +/- osteotomy

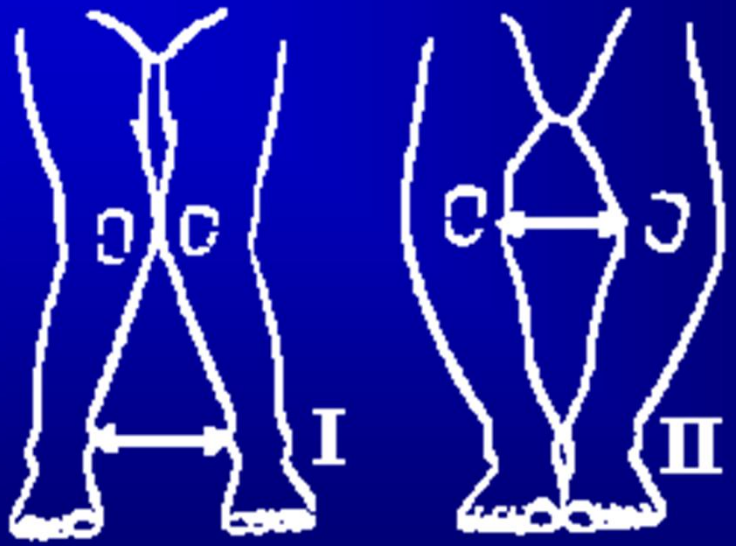
older age ⟶ as individual



Case 2

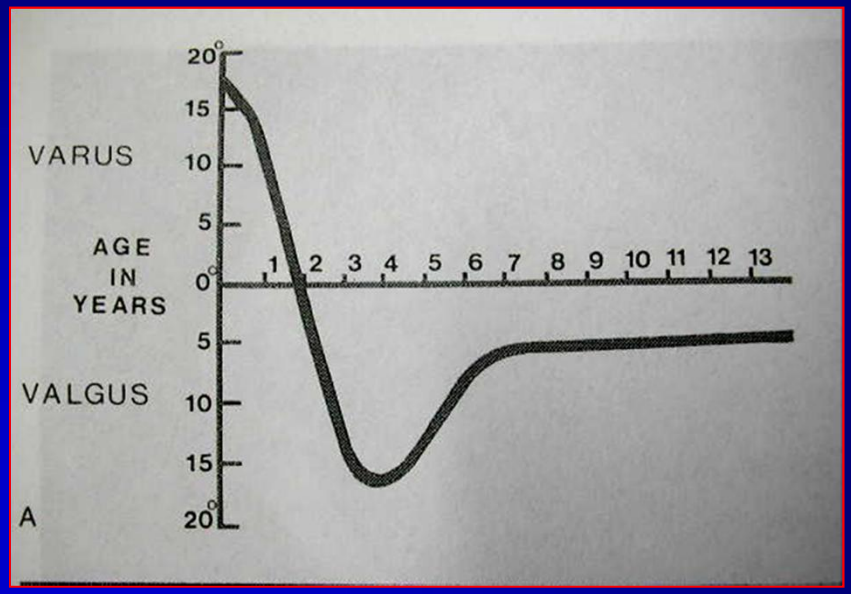
Genu Varus / Genu Valgus

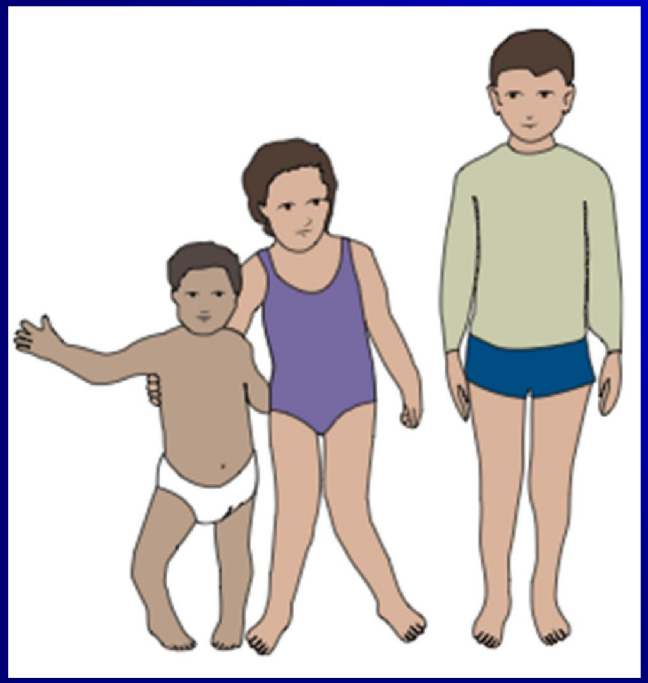
- Genu Varus (Bowlegs) and Genu Valgus (knocknees)
- common problems in children
- mostly are physiologic development, not pathologic
- Tibiofemoral angle in children change with time

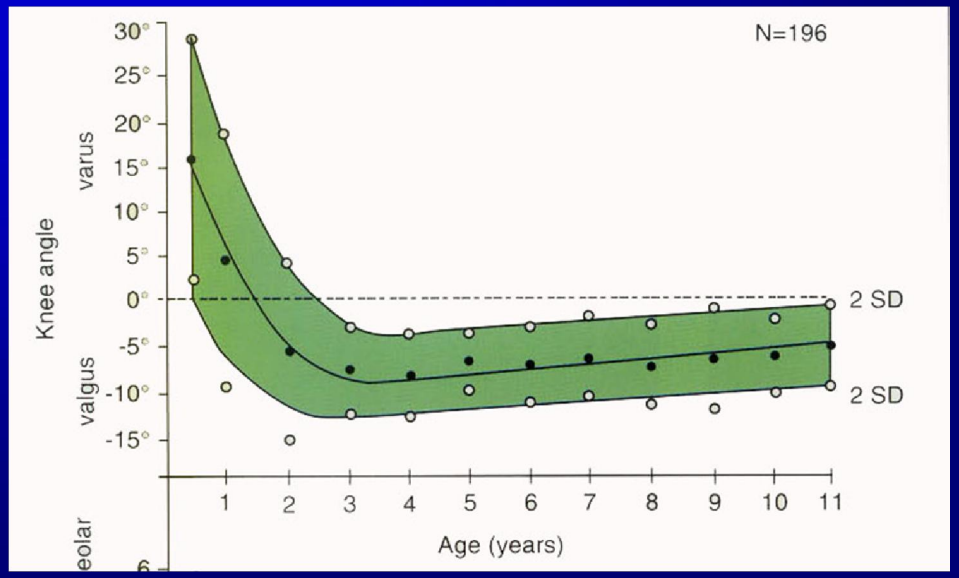


Tibiofemoral angle

Physiologic development of leg alignment at various ages

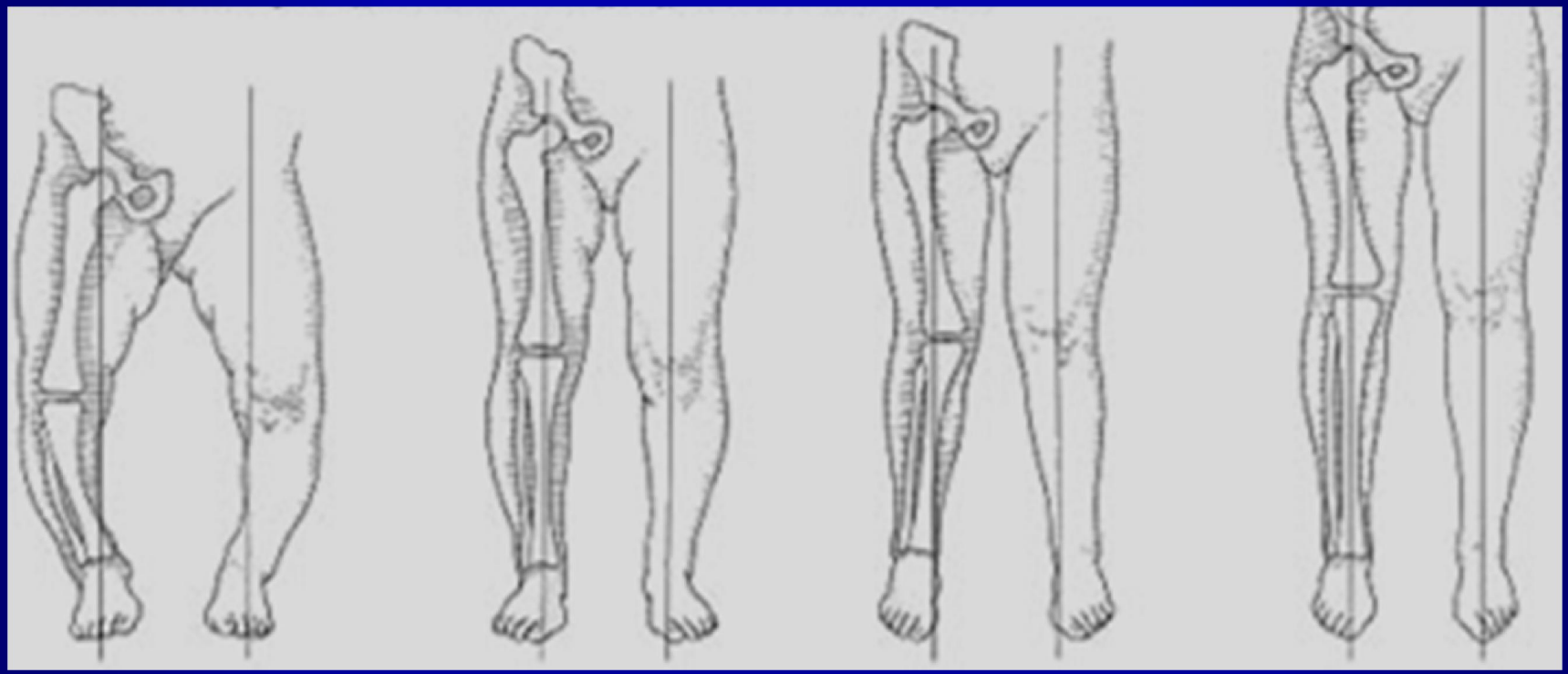






Tibiofemoral Angle

Physiologic development of leg alignment at various ages



Newborn	1.5 to 2 yrs	3-4 yrs	7 yrs
Moderate genu varus	leg straight	maximal genu valgus	genu valgus

Common causes of Genu Varus

Genu Varus

- Physiologic bowleg
  - bilateral, symmetry, not severe
- Rickets
- Tibia vara

Vitamin D deficiency rickets

- short stature
- severe deformity
- abnormal x-rays findings

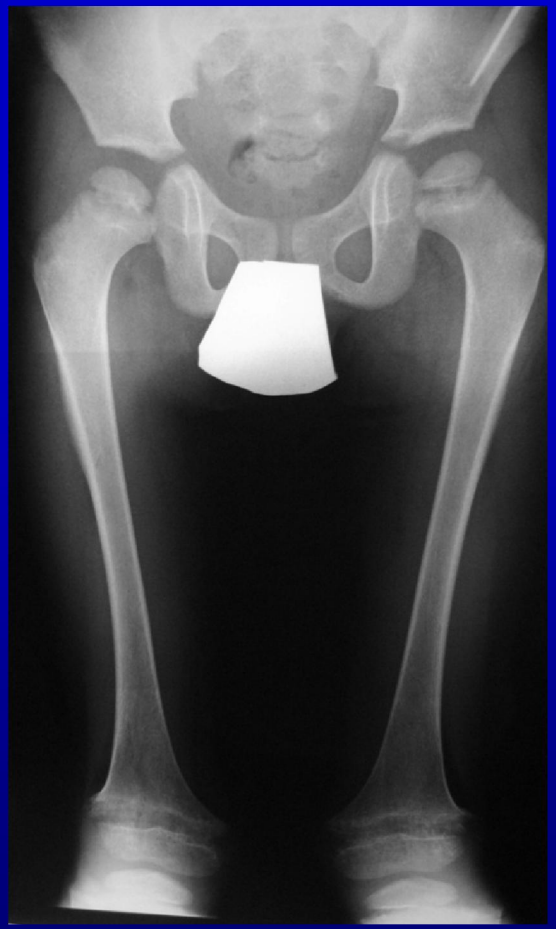
Common causes of Genu Valgus

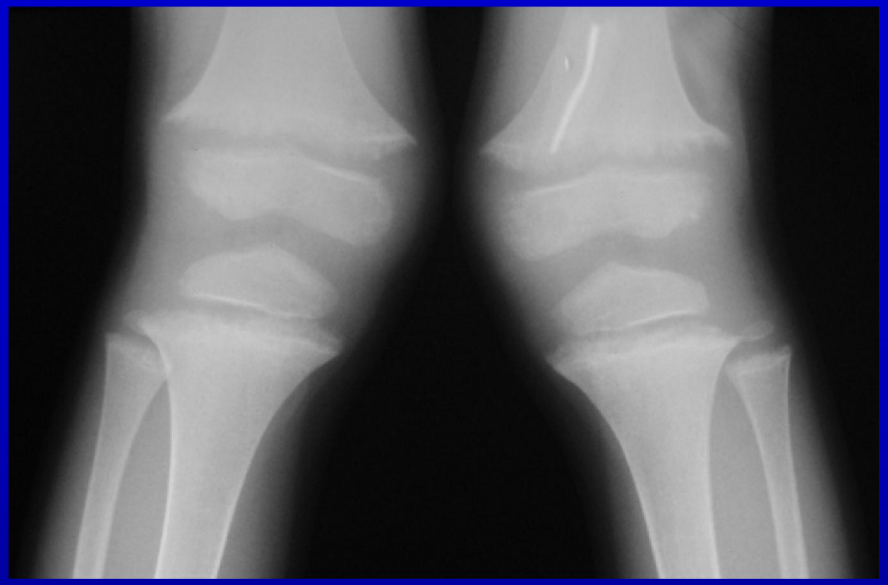
Genu valgus

- physiologic genu valgus
- posttraumatic
- rickets

Rickets from Renal tubular acidosis

Rickets from RTA





Osgood Schlatter disease

- Osteochondritis of tibial tuberosity
- Overuse injury or repetitive stress at tibial tubercle
- Age 11 – 13 yrs

Osgood Schlatter disease

- Pain at tibial tubercle exacerbated by running or kneeling
- Swelling, tenderness at tibial tubercle
- Rx:

  - decrease activity

  - NSAIDS

Growing pain

- Unknown etiology
- Overactivity??
- More common in boys (2- 5 yrs old)
- Leg pain (mild-moderate) often bilateral
- Most: not pain or limp during the day
- Often pain in the evening or at night

Growing pain

- Often pain in the evening or at night
- Rarely: fever, wt loss malaise
- X rays: most..not necessary
- Rx: - reassure
  - mild analgesic
  - gentle massage

Case 3

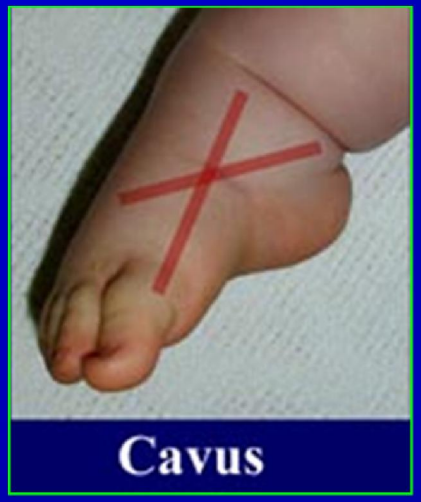
Congenital clubfoot

Congenital Talipes Equinovarus :

- Common congenital foot deformity that may associate with other syndromes or disease

Congenital clubfoot

- Complex deformity :
  - *foot - Cavus*
  - *forefoot - Adduct***
  - *heel - Varus***
  - *ankle - Equinus***



Congenital clubfoot

Incidence:

- 0.6 – 6.8 / 1000 live births (depend on race)
- Caucasians 1.2/1000 live births
- Medicine CMU 2.7/1000 live births
- Boy : girl = 2-4: 1
- bilateral = 50%

Congenital clubfoot

Etiology:

- Unknown
- Multifactorial

Pathoanatomy:

- Deformity of talus
- Malrotation of talus and calcaneus

Congenital clubfoot

Physical examination:

- complete examination (lower & upper extremities)
- neurological examination

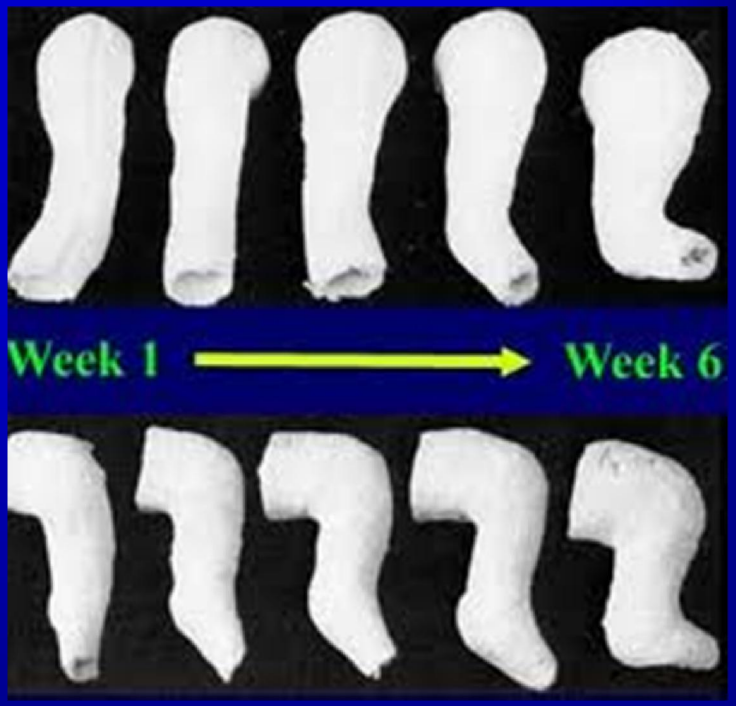
Rt. Clubfoot

Congenital idiopathic clubfoot

Treatment :

- early manipulation and casting
- serial casting every 1 week.

until the deformities corrected



Ponseti's Casting

Congenital idiopathic clubfoot

Treatment :

- if failure of conservative treatment:

  Soft tissue release (limited)

  Combined bony procedures (older 4 years of age)

Case 4

Idiopathic Scoliosis

Def^{n} : spinal curvature in coronal plane occurring in normal healthy patients (curve > 10 degrees)

Class^{n}: (onset of Dx)

- Infantile (birth – 3yr)
- Juvenile (4 – 10)
- Adolescent (after 10 yr)

  **most common type
- Adult (after skeletal maturity)

Idiopathic Scoliosis

Clinical : rib hump, asymmetrical shoulder level, neck line or waist line

Assessment :

- Adam's forward bending test
- Plumb line
- complete neurological exam

Idiopathic Scoliosis

Treatment : depend on → *age of onset, skeletal maturity, curve magnification & location, curve progression*

Nonoperative :

- **Exercise**
- **Brace:**

Indication for orthotic (brace) treatment

- Curve > 20 – 25 degrees
- Curve progression > 5 degrees

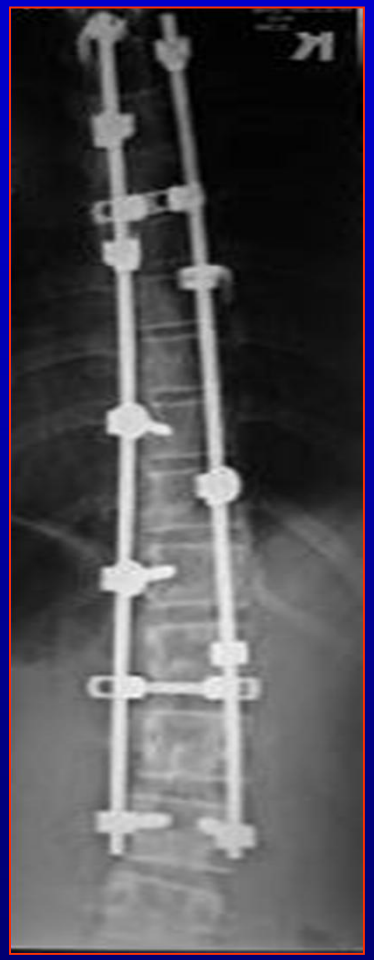
Treatment

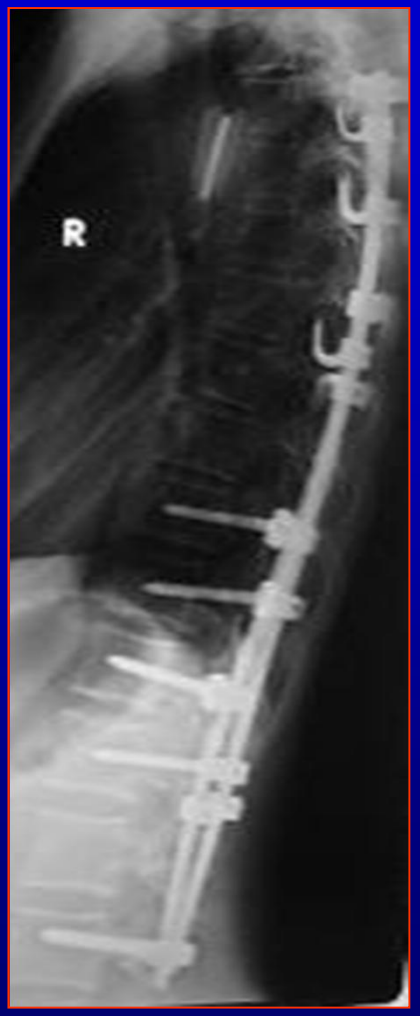
- Duration of Brace
  (20 – 22 hr/day)

Operative treatment: Posterior fusion and instrumentation

Posterior fusion and instrumentation

- Curve > 50 degrees
- Curve progression
- Imbalance spine





Legg-Calvé-Perthes Disease

Def^{n} : *idiopathic avascular necrosis in proximal femoral epiphysis of growing hip*

Etiology : unkhown

Epidemiology :

- 4 – 8 yr , M : F = 5/1
- bilateral 10 – 12

Legg-Calvé-Perthes Disease

Clinical : limping, thigh pain, knee pain

PE : antalgic, Trendelenburg gait, limit ROM of hip
(esp. abduction, internal and ext rotation)

Radiographic finding :

- *change* radiodensity of prox femoral epiphysis
(radiolucency & increased radiodensity)
- flattening of epiphysis

Legg-Calvé-Perthes Disease

Radiographic finding :

- *change* radiodensity of prox femoral epiphysis (radiolucency & increased radiodensity)
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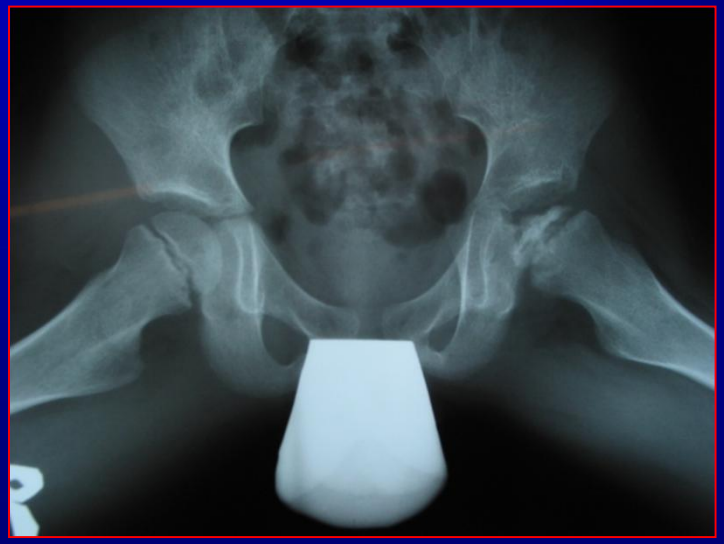


Legg-Calvé-Perthes Disease

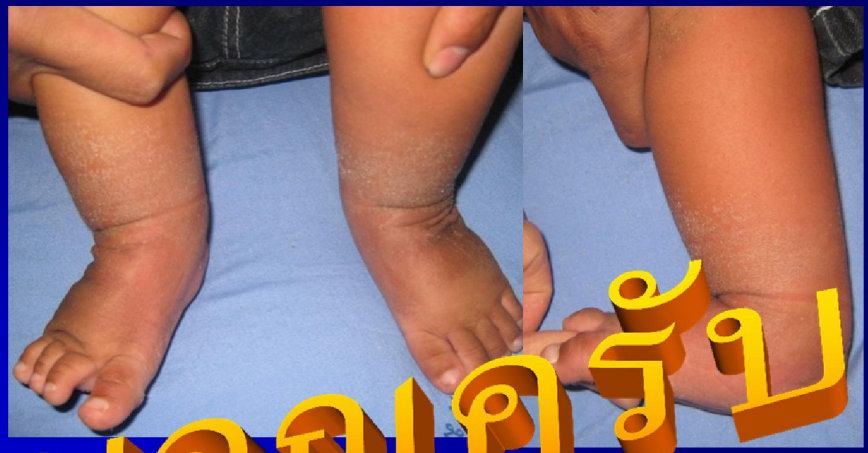
Treatment :

initial step : ↓ synovitis, ↑ ROM

next step : containment (concentric hip)

→ pelvic osteotomy

→ femoral osteotomy



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