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
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

[Images of a baby's legs and hip showing symptoms of developmental dysplasia of the hip.]
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
Moderate genu varus

1.5 to 2 yrs
Leg straight

3-4 yrs
Maximal genu valgus

7 yrs
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
Growing pain

- **Hx**: Pain improved with massage, analgesics
- **Rx**: Reassure, short-term NSAIDs
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%
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)*
Idiopathic Scoliosis

**Definition**: spinal curvature in coronal plane occurring in normal healthy patients (curve > 10 degrees)

**Classification**: (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 \(\rightarrow\) 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**: idiopathic avascular necrosis in proximal femoral epiphysis of growing hip

**Etiology**: unknown

**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