Pediatric Orthopedics-

From Flat Heads to Crooked Feet and Curvy Spines in Between

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I do not have any financial or relationships to disclose regarding my presentation

Intoeing

- Foot-Metatarsus Adductus
- Lower leg-Internal Tibial Torsion
- Upper leg-Femoral Anteversion

Packaging Issues

- Metatarsus Adductus
- Internal Tibial Torsion
- Physiologic genu varum
- Torticollis
- Hip dysplasia

Metatarsus Adductus

- Adduction of the forefoot resulting in intoeing
- Epidemiology
  - 1st born more common
  - Equal occurrence with gender
  - May be associated with hip dysplasia and other molding disorders
- Treatment usually not necessary

NOT to be confused with Clubfoot

- **Talipes Equinovarus**

1. Rigid
2. Hind and midfoot are varus
3. Forefoot adductus
4. Calf atrophy
5. Hypoplasia of tibia, fibula and foot bones

- Treated with serial casting

Know the difference!

Metatarsus Adductus

- Flexible ankle
- No hindfoot deformity
- Forefoot adductus
- Child usually grows out of it

Clubfoot

- Ankle equinus
- Hindfoot varus
- Forefoot adductus
- Requires casting, bracing, surgery

Internal Tibial Torsion

- Tibias are rotated inward
- Patellas are straight
- Usually resolves without treatment by age 2

Femoral Anteversion

- Femur rotated internally
- Causes patella and feet to point inward
- Peaks around age 3
- Resolves with growth by age 8-9

Torticollis

- Tightness of one of the Sternocleidomastoid muscles
- Decreased ROM of baby's neck
- Can develop skull and facial deformities
- Treat with PT
- Sometimes need helmet for molding

Hip problems

- Developmental Dysplasia
- Leg Calve Perthes
- Slipped Capital Femoral Epiphysis
- Transient Synovitis
- Septic Arthritis

Developmental Dysplasia of the Hip

- AKA DDH, Congenital Hip Dysplasia
- Epidemiology
  - First born
  - Female
  - Frank breech birth
  - Oligohydramnios
  - Associated with estrogen from mom, packaging

DDH

- Clinical Manifestation
  - Positive Barlow's
  - Positive Ortolani's
  - Extra skin folds
  - Shorten extremities
  - Uneven knee levels (Galeazzi Sign)
  - Asymmetric abduction

Dx of DDH

- Clinical exam
- AP X-ray after 3 months of age
- Hip ultrasound prior to 3 months

Legg-Calve-Perthes

Etiology

- Idiopathic osteonecrosis or avascularization of the CFE
- Bone growth deficiency is cause by decrease CFE blood supply

Epidemiology

- Males > Females 4-5:1
- Only 20% are bilateral
- Age of onset is 2-12 years, with a mean age at 4-8 years

Legg Calve Perthes

Clinical Manifestation

- Classic presentation is a “painless limp”
- May have mild pain
- Disproportional growth and short stature
- Proximal thigh atrophy

Lab/Diagnostic

- Hip X-ray

Legg Calve Perthes

- Treatment
  - Treatment is aimed at preventing femoral head deformity and OA
  - Rest, PT and strengthening exercises
  - Containment (Scottish-Rite Brace)
  - Casting and surgery

Slipped Capital Femoral Epiphysis

- AKA SCFE
- Epidemiology
  - Boys (age 13-15) > Girls (age 11-13)
  - Usually overweight
  - Can be associated with endocrine d/o (Hypothyroidism, hypogonadism)

SCFE

- Signs and Symptoms
  - Hip pain
  - Can c/o knee or groin pain
  - Limp
  - External rotation of leg
  - Pain with internal hip rotation

Goals of Treatment

- **Containment**
- **Prevention of further slippage**
- **Avoidance of AVN**

Treatment-

Percutaneous pinning

Transient Synovitis

- Occurs when a systemic virus decides to hang out in the hip
- Hip pain, unable to weight bear, limping
- Could have a fever
- Pelvis x-ray is normal
- CRP, Sed rate is usually elevated
- CBC with diff is normal
- No treatment

Septic Arthritis

- Hip pain, fever, inability to weight bear, limp
- The kid looks sick
- White count, Sed rate, CRP are elevated
- Medical emergency!
- Surgery for open debridement and washing out, IV antibiotics post op
- Failure to treat promptly results in degradation of hip joint

Types of Scoliosis

- Congenital
- Neuromuscular
- Idiopathic

Congenital

- Usually caused by a malformation of the vertebra
- Can be diagnosed on prenatal ultrasound
- Usually diagnosed by physical exam of the infant and x ray

Neuromuscular

- Associated with a neuromuscular condition (CP, MD, genetic syndromes)
- Usually long, sweeping curves

Idiopathic

- Most common type
- We don't know why it happened
- These curves are usually S shaped
- Classified by age at diagnosis
  - Infantile-birth to age 3
  - Juvenile-ages 4-10
  - Adolescent-ages 11-17

Important history questions

- Who noticed curvature? When?
- Any back pain?
- Any numbness or tingling in arms or legs?
- Any bowel or bladder problems?
- Have you had first period yet? (girls only)
- Any family history of scoliosis?

Physical Exam

- Adam's forward bend-scoliometer
- Brief neuro exam
  - Walk on toes, heels
  - Hop on one foot
  - Squat down and come up
  - Abdominal reflexes
  - Babinski reflex

X Ray

- Order PA and Lateral of entire spine
- Measure the Cobb angle
  - 0-10 degrees = Spinal Asymmetry
  - 11-20 = Mild Scoliosis
  - 21-40 = Moderate Scoliosis
  - 40-50 = Severe Scoliosis
  - >50 = Surgery

Cobb Angles

- Cobb angles are measured by drawing a line at the bottom of the vertebra that is most tilted
- A second line is drawn on the top of the vertebra that is tilted the most in the opposite direction
- A line is then drawn perpendicular to each of the lines and the angle that is formed is the measurable Cobb angle

Adolescent Idiopathic Scoliosis

- Dx 11-17
- MC in girls
- Curves <20 degrees, monitor q 6 months
- Curves 20-30 consider bracing (factor in pts maturity)
- Curves >30 brace, continue to monitor q 6 mo
- Curves > 50 surgery (Posterior Spinal Fusion)