

Pediatric Orthopedic Pearls

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No conflict of interest to disclose



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Objectives

- Understand indications for ultrasounds and x-rays in suspected DDH
- Differentiate between adolescent anterior knee pain and other pathologies
- Be able to identify key pathological causes of the limping child
- Differentiate the varying types of osteochondrosis



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Hip Dysplasia

Indications for radiological exam of the hip:

< 5-6 months of age → HIP ULTRASOUND

> 6 months of age → AP PELVIS X-RAY



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Indications for Radiological Exam of the Hip

< 6 MONTHS OF AGE

- Any hip instability on exam
- Hip click but stable exam-**NOT** AN INDICATION
- Family history of DDH (parent/sibling)
- Breech presentation-especially frank breech



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Timing for Radiological Exam of the Hip

< 6 MONTHS OF AGE

- Normal exam but high risk (family history/breech) → Hip U/S at 6 – 8 weeks of age
 - To avoid false positives (physiologically immature acetabulum)
- Hip instability → refer and hip U/S at 1 -2 weeks of age



Indications for Radiological Exam of the Hip

>6 MONTHS OF AGE

- ↓ hip abduction
- Leg length discrepancy (LLD)
- High risk (family history/breech)
 - if hip U/S not previously done
- Asymmetrical skin fold(s) with symmetrical abduction is **NOT** an indication



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Pearls

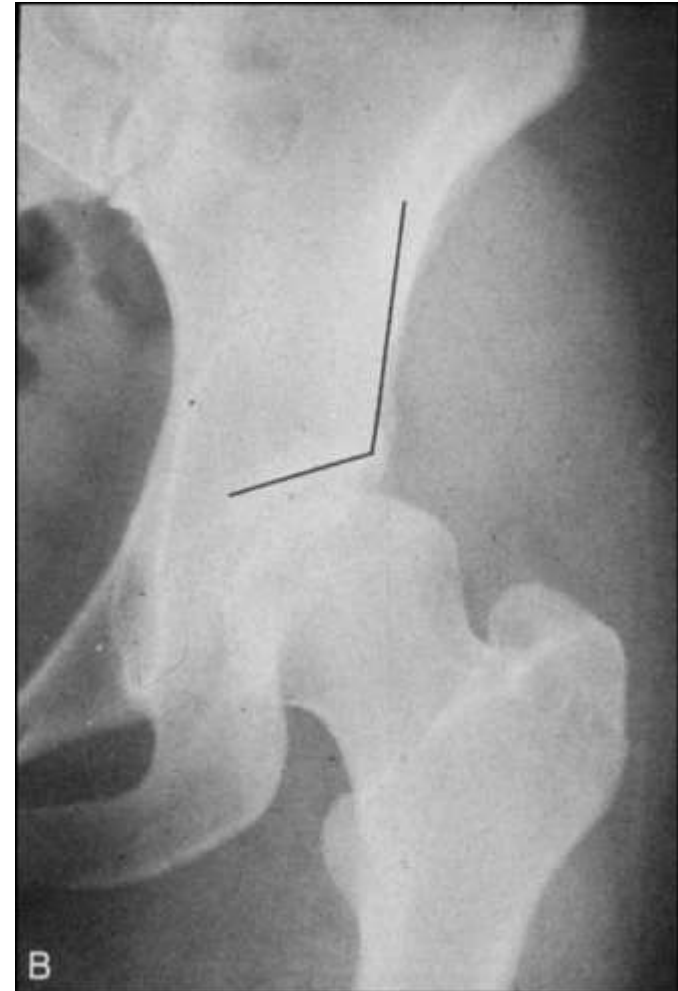
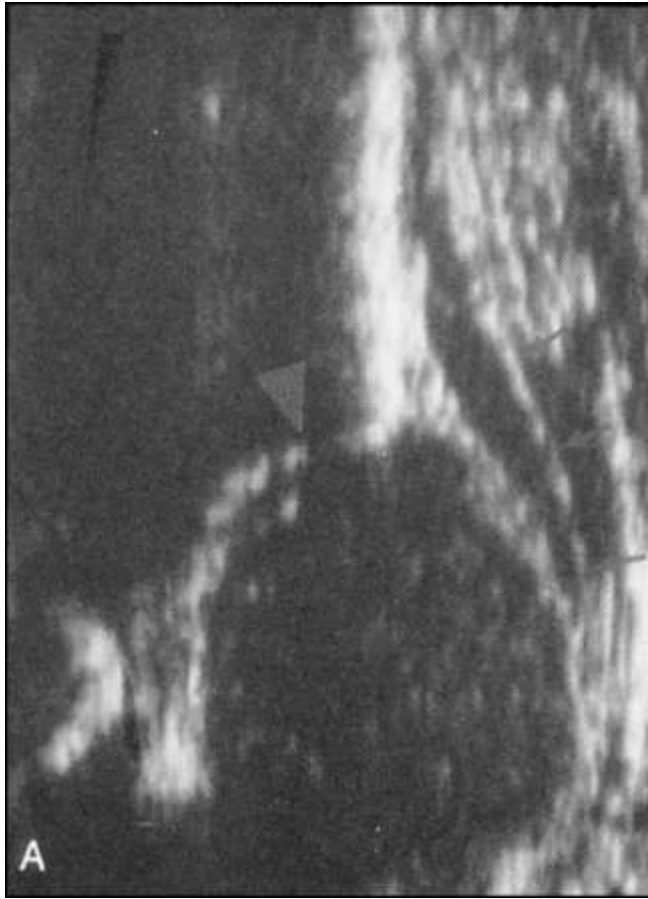
- High risk (family history/breech) with a normal hip ultrasound, still requires an AP-Pelvis X-ray at the age of 1
- 7.2% of normal hip U/S in high-risk babies may have later hip dysplasia



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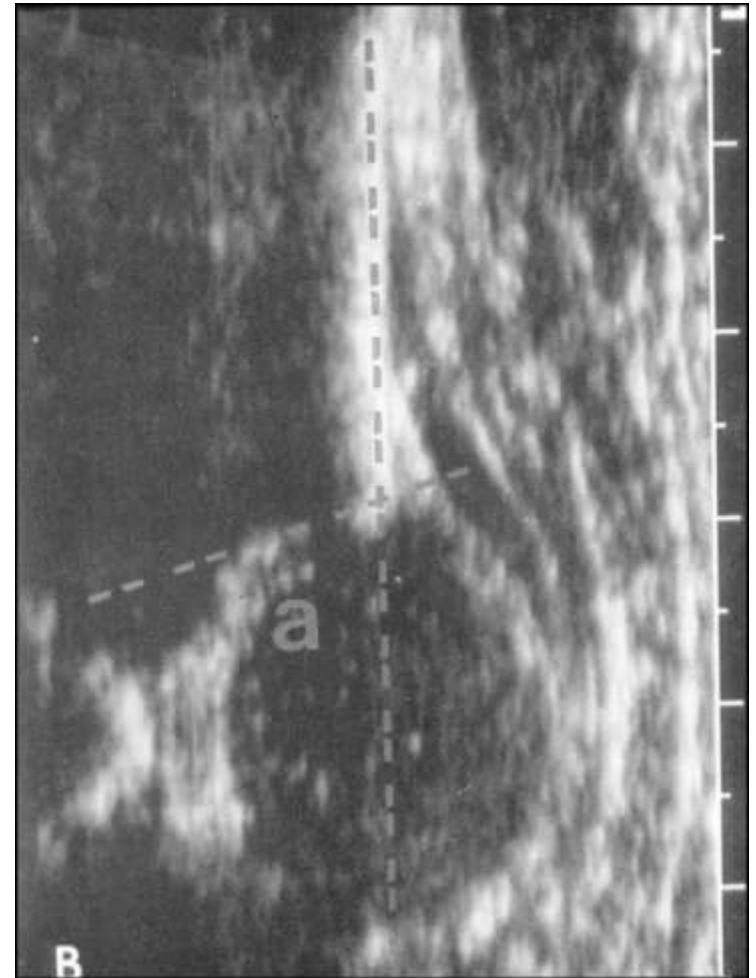
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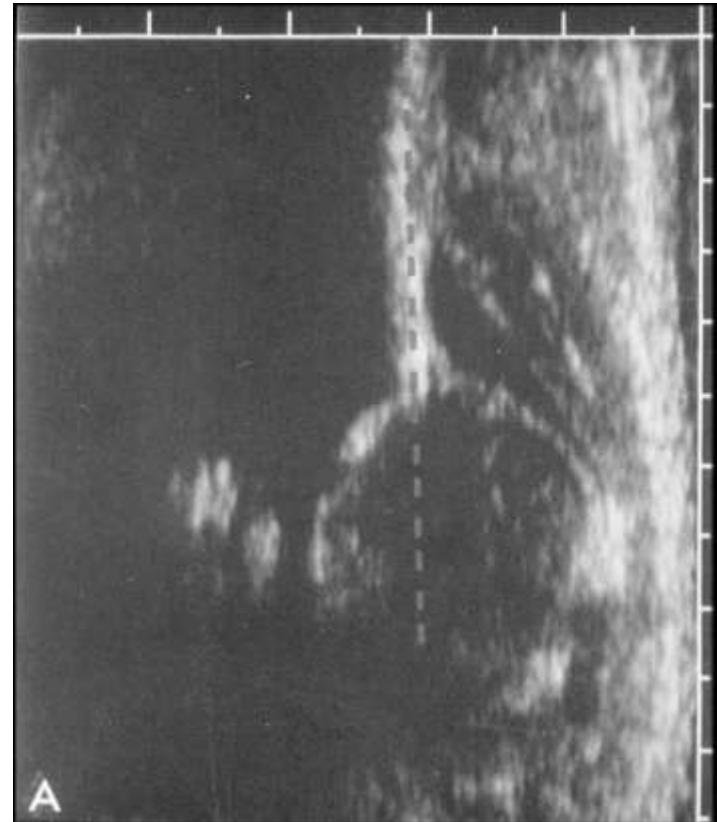
ALPHA ANGLE

- $> 60^\circ$ is normal
- $< 50^\circ$ is pathological
- $50 - 60^\circ$ represents a physiologically immature acetabulum only in infants < 3 months of age



PERCENTAGE COVERAGE

- $> 50\%$ is normal
- $< 40\%$ is pathological
- $40 - 50\%$ may be a normal finding up to 3 months of age

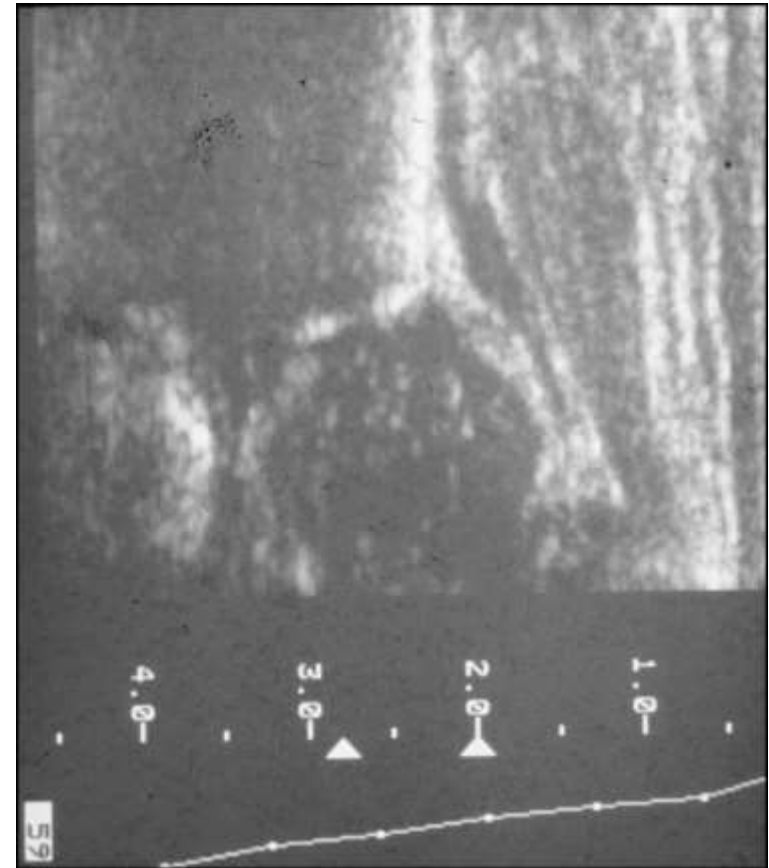
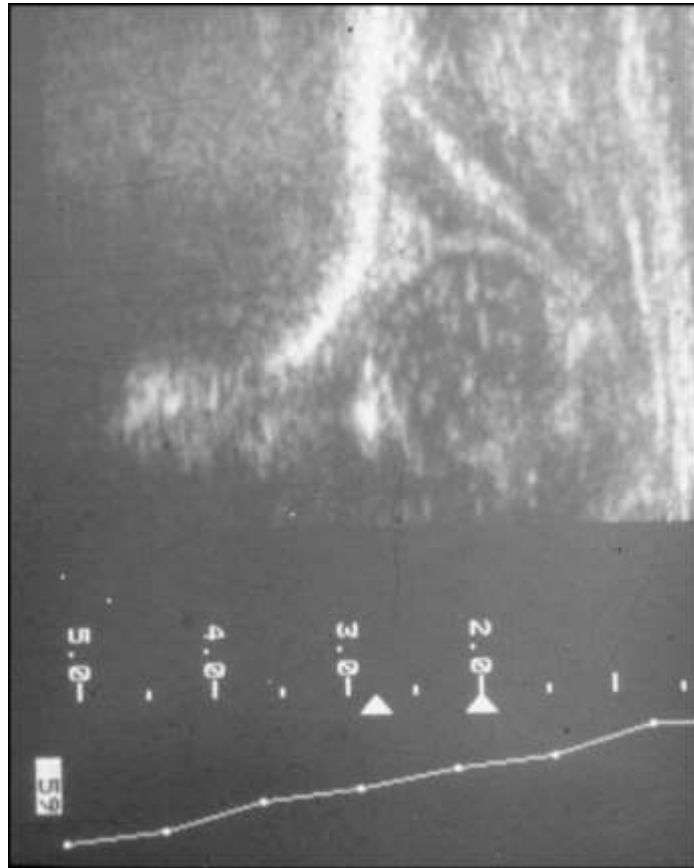


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Pre/Post Pavlik Harness Treatment



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Knee Pain in Adolescent (Non-traumatic)

- Must R/O hip pathology
- Unilateral knee pain – always get X-ray (AP/Lat/Tunnel) no matter how benign it seems
- In ♀ miserable malalignment syndrome (usually bilateral)



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Miserable Malalignment



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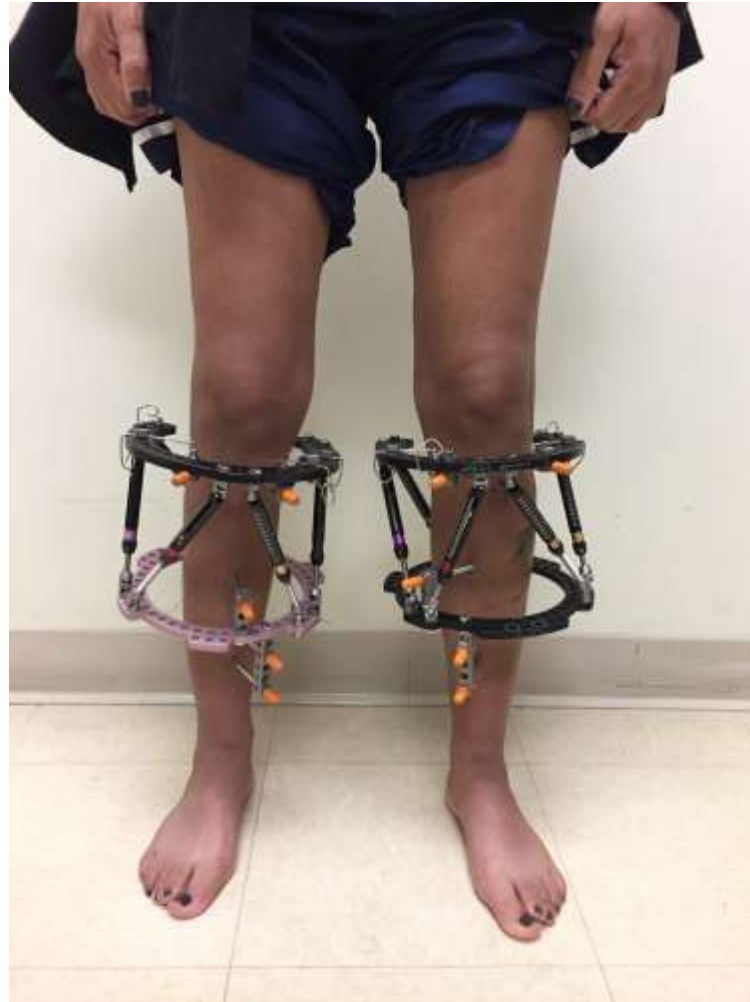
Femoral Derotation Osteotomy



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Tibial Derotation Osteotomy



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Limping Child

Only emergency is to rule out infection
(osteomyelitis or septic arthritis)



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Kocher Criteria (Septic Arthritis of the Hip)

- Inability to weight-bear
 - Fever $> 38.5^{\circ}$
 - ESR > 40
 - WBC $> 12,000$
 - 1/4 $\rightarrow 3\%$
 - 2/4 $\rightarrow 40\%$
 - 3/4 $\rightarrow 93\%$
 - 4/4 $\rightarrow 99\%$
 - CRP – independent risk factor
- Chance of septic arthritis



Order of Sensitivity

- Fever > CRP > ESR > refusal to weight-bear > WBC
- CRP > 2.0 + refusal to weight-bear → 74% probability of septic arthritis



Limping Child

- Once infection ruled out and no history of trauma:
 - Eliminate hip pathology (AP & Frog-leg Pelvis X-rays)

or

- Eliminate leg length discrepancy
 - made standing using PSIS dimples
 - blocks to level



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AP Pelvis X-Ray (DDH)



- 0-4 Years of age
- Female:Male
13:1



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AP & Frog-Leg Pelvis X-Ray (LCP)

Legg-Calvés Perthes Disease



- 4-8 years of age
- Males:Females
4:1
- ↑ in Inuits



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Standing & Frog-Leg Pelvis X-Ray (SCFE)

Slipped Capital Femoral Epiphysis



♀:10-12, ♂:12-15

If falls out of age range, think of endocrinopathy (thyroid, panhypopituitarism)



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Osteochondrosis

- Sinding-Larsen-Johansson Syndrome
 - 8-10 ♀
 - 10-12 ♂
- Osgood-Schlatter`s Disease
 - 10-12 ♀
 - 12-14 ♂

Key is they all have pinpoint tenderness on palpation



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Sinding-Larsen-Johansson Syndrome

- 8-10 ♀
- 10-12 ♂

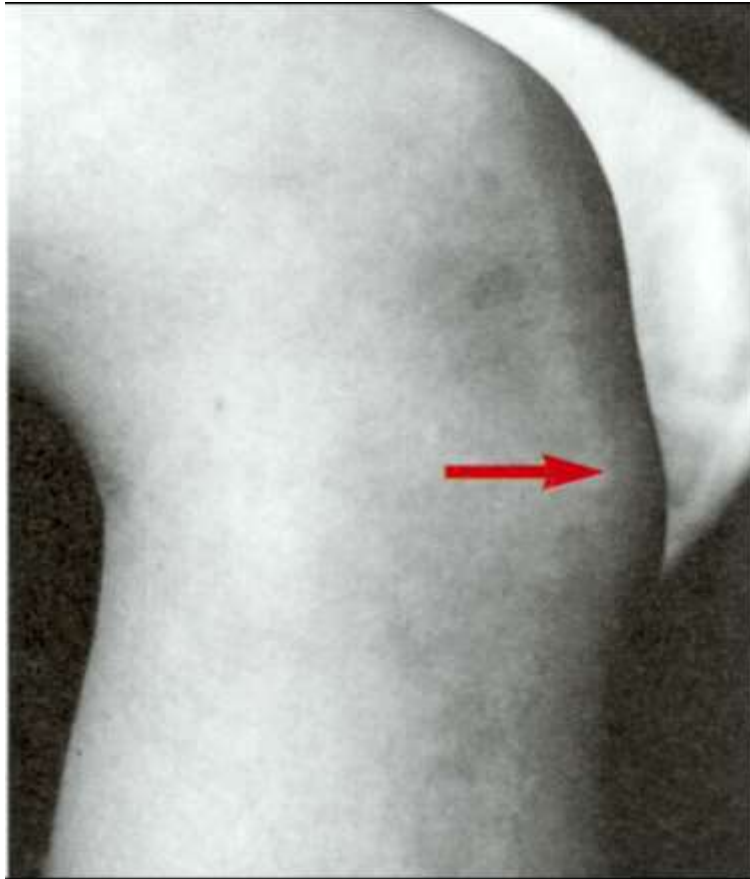


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Osgood-Schlatters Disease



- 10-12 ♀
- 12-14 ♂



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Osteochondrosis

- Sever`s Disease (Calcaneal Apophysitis)

- 8-10 ♀
- 10-12 ♂

- Iselin Disease

- 9-11 ♀
- 10-12 ♂

Key is they all have
pinpoint tenderness
on palpation



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Sever`s Disease

- Pin-point tenderness at Achilles Tendon insertion on calcaneus

–8-10 ♀

–10-12 ♂



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Iselin Disease

- 9-11 ♀
- 10-12 ♂



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Treatment

- Symptomatic
 - Stretch, ice
 - NSAID
 - Restrict sports only if child is in too much pain
 - Sports as tolerated



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Thank you !

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