

RADY 403 Case Presentation

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Focused patient history and workup

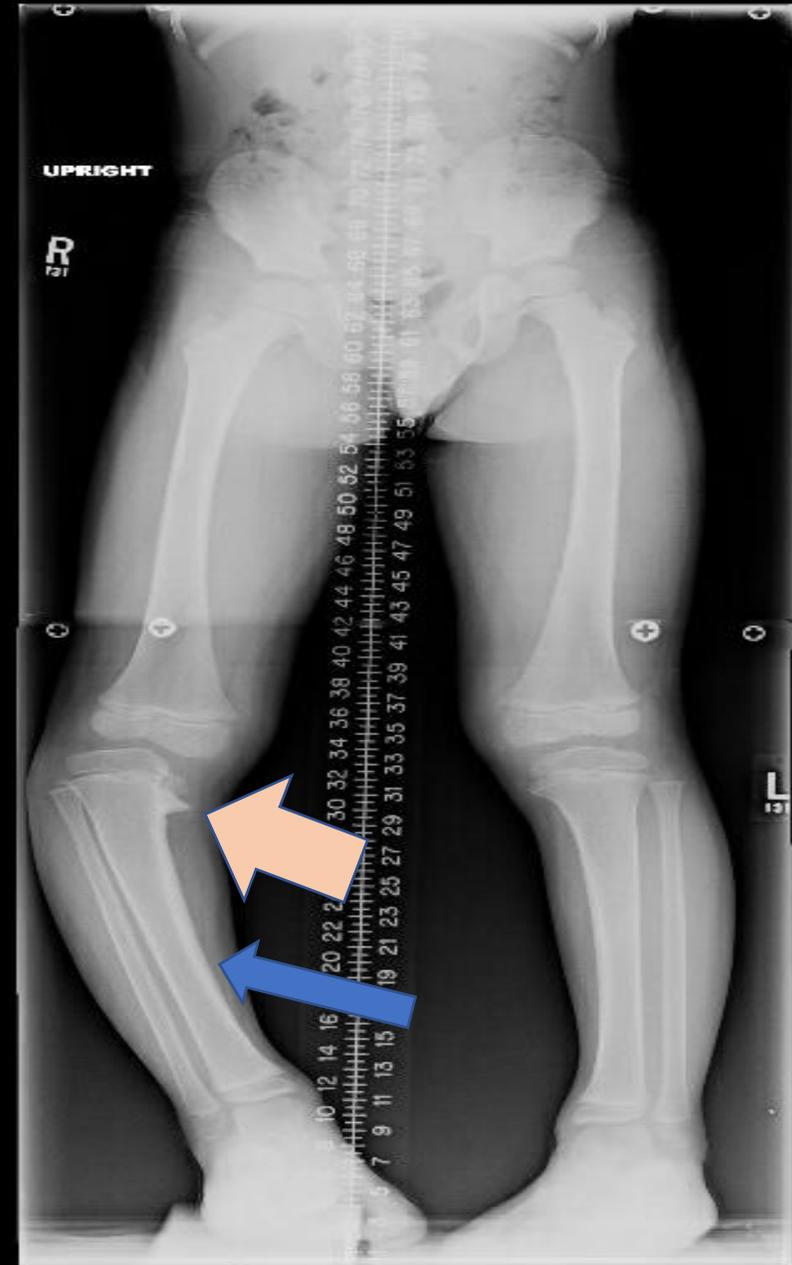
- 5 year old male
- Presenting with bowing of his right leg that his parents have noticed since he began walking around one year of age
- Intermittently complains of pain along lateral knee
- He is still able to be active and plays soccer with his brothers
- Patient's two brothers both had bowing of bilateral legs that resolved as they grew

List of imaging studies

- XR Hip Knee Ankle Bilateral
- XR Tibia Fibula Right
- MRI Lower Extremity Joint Right Wo Contrast
- CT Lower Extremity Right Wo Contrast

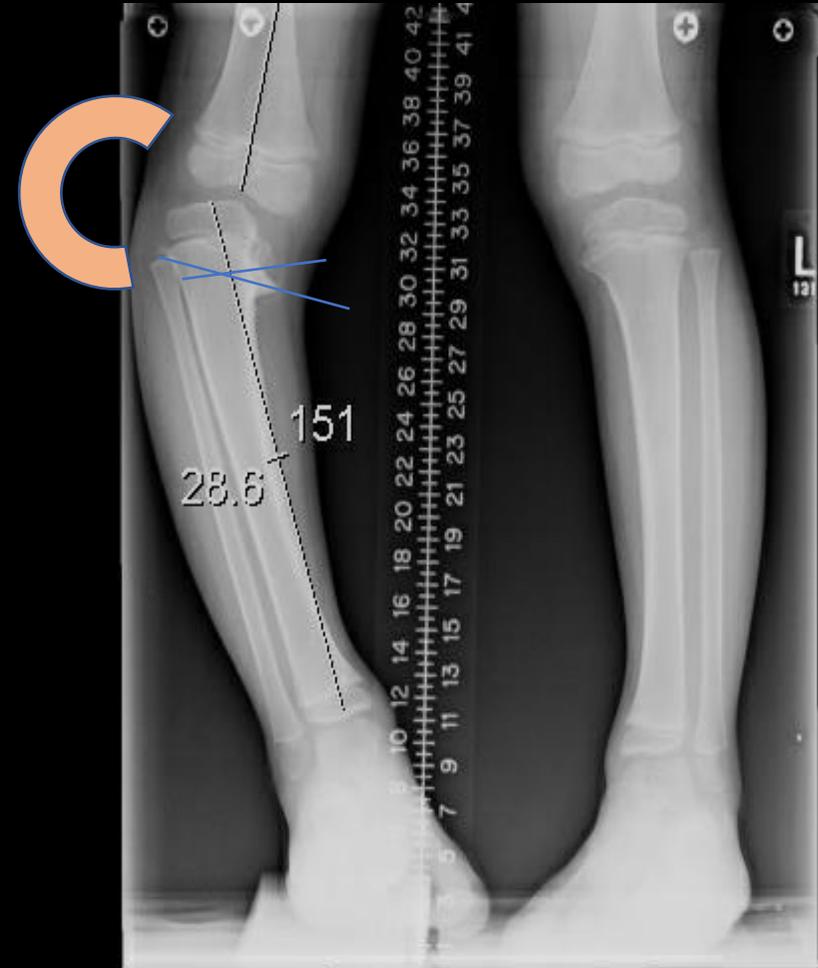
XR Hip Knee Ankle Bilateral

- Right proximal tibial metaphysis is flattened and fragmented
- Medial beaking and downward slope of the proximal tibia
- Thickening of medial tibial cortex
- Leg length discrepancy (patient is standing on a 2 cm block)



XR Hip Knee Ankle Bilateral

- Varus angulation of the right knee
- Tibiofemoral angle $> 180^\circ$
(normal = 170° - 175°)¹
- Proximal tibial metaphyseal-diaphyseal angle (normal $< 16^\circ$)¹



XR Tibia Fibula Lateral Right

- Radiographically normal



MRI Lower Extremity Joint Right Wo Contrast

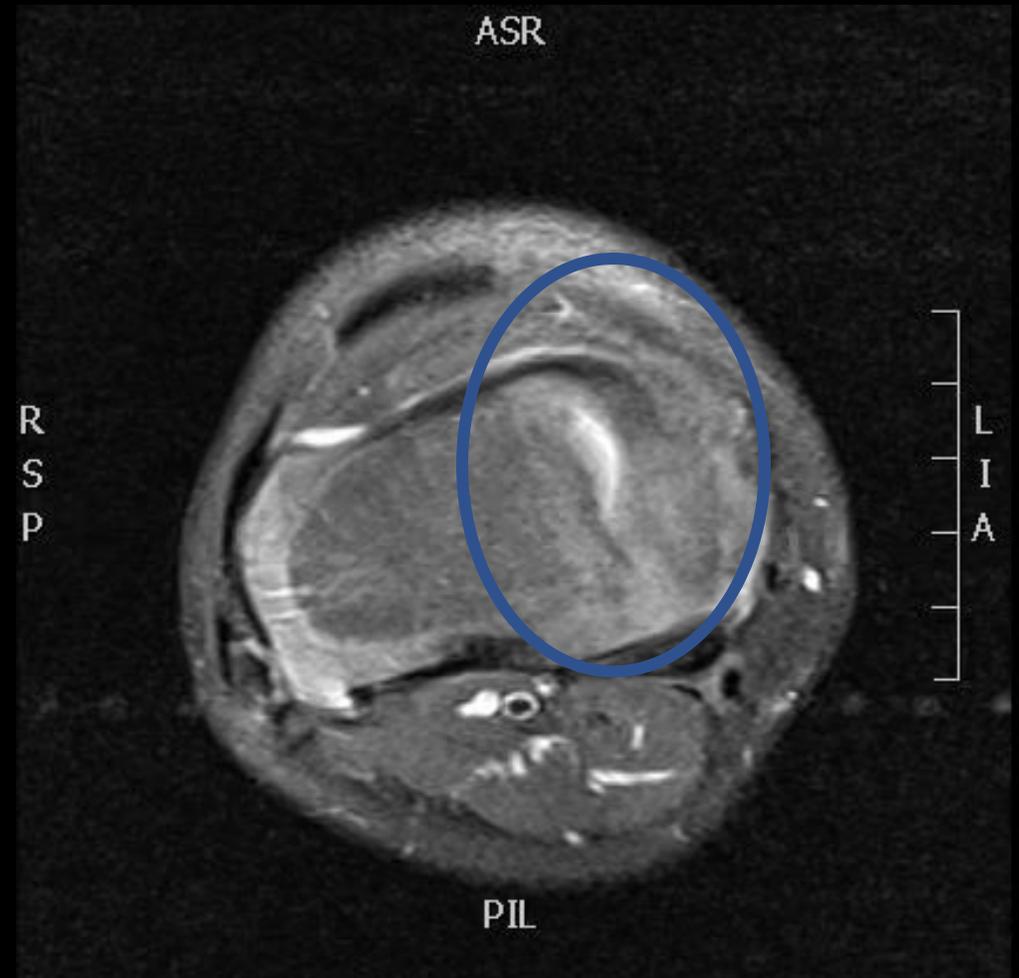
- Proximal tibial physis is discontinuous along portions of medial tibial plateau
- Heterogenous marrow signal along medial physis (could be from altered growth patterns or altered biomechanics)



T2 coronal of right knee

MRI Lower Extremity Joint Right Wo Contrast

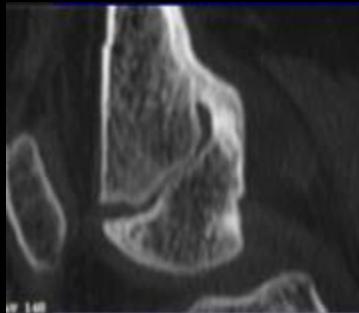
- Increased T2 signal along medial meniscus, otherwise intact



T2 axial of right knee

CT Lower Extremity Right Wo Contrast

- Presurgical workup included CT scan to check for physeal bar (not found in this patient)



Example of distal femoral physeal bar
(bony bridge crossing the physis)



Blount Disease

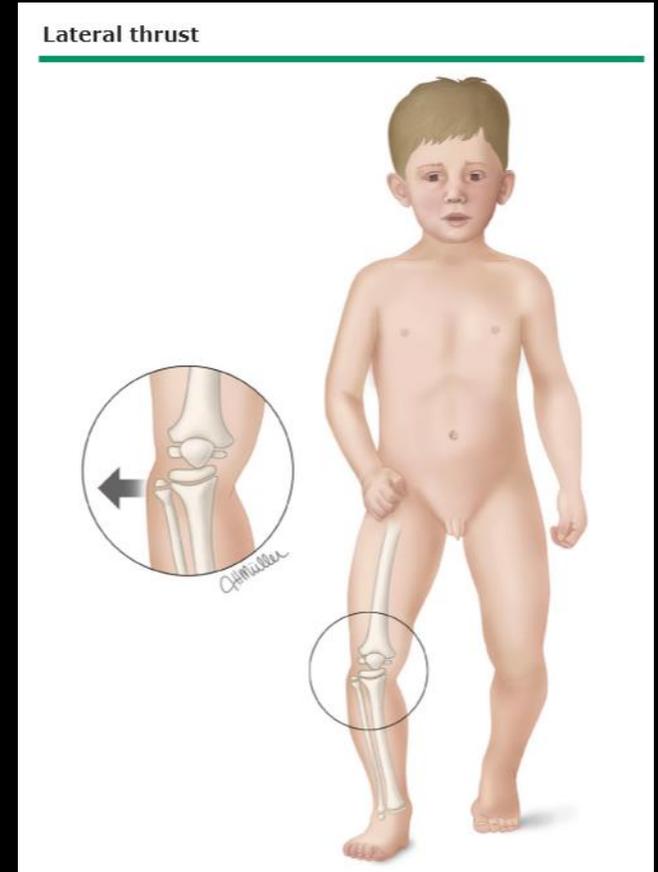
- Pathologic varus deformity from disruption of normal cartilage growth at medial aspect of proximal tibial physis¹
- Infantile Blount disease: diagnosed before age four and bilateral (80 percent of cases)²
- Adolescent Blount disease: diagnosed later and more likely to be unilateral



<https://orthoinfo.aaos.org/>

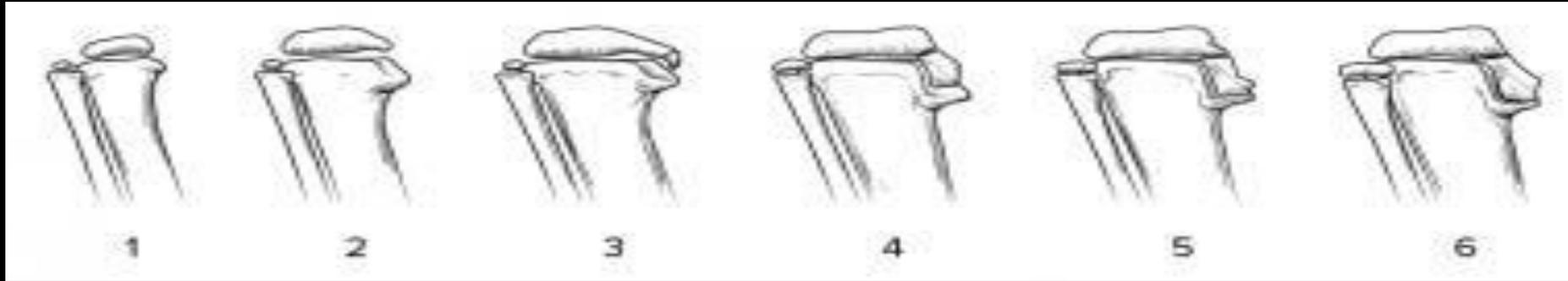
Physical Exam Findings

- Asymmetric alignment of lower extremities
- Focal angulation of the proximal tibia
- Lateral thrust during stance phase of ambulation



UpToDate, Approach to the Child with Bow-Legs

Langenskiold classification



<https://emedicine.medscape.com/article/406458-overview>

- Six progressive stages as age of patient increases
- Stage 1 – medial beaking begins
- Stage 4 – epiphysis slopes over medial beak
- Stage 5 – “double epiphysis”
- Stage 6 – formation of bony bar

Typical Treatment

- Conservative approach: bracing before age 3 (effective in 50-80% of patients if started in time)¹
- Surgical approach³:
 - Hemiepiphysiodesis (arrest of the growth plate on the apical side of the deformity)
 - Tibial osteotomy and realignment

Patient treatment or outcome

- Osteotomy of proximal tibia
- Right proximal tibia lateral hemiepiphysiodesis

- 3 months s/p surgery – patient is doing very well, no adverse events, transitioning to weightbearing in cam boot



Wrap Up

- Disruption of the cartilage growth along the medial aspect of the tibia leading to varus deformity
- Two types:
 - Infantile (occurs before age four and usually bilateral)
 - Adolescent (occurs later in childhood and more often unilateral)
- Characteristic radiographic findings:
 - Metaphyseal beaking
 - Thickening of medial tibial cortex
- Treatment:
 - Infantile: bracing often effective
 - Adolescent: surgical (hemiepiphysiodesis)

References

1. Rosenfeld, S. (2021, March). *Approach to the child with bow-legs*. UpToDate. <https://www.uptodate.com/contents/approach-to-the-child-with-bow-legs/abstract/16>
2. Kling TF Jr. Angular deformities of the lower limbs in children. *Orthop Clin North Am*. 1987 Oct;18(4):513-27. PMID: 3313160.
3. Loder RT, Johnston CE 2nd. Infantile tibia vara. *J Pediatr Orthop*. 1987 Nov-Dec;7(6):639-46. PMID: 3429646.