

Genu Varum Clinic Guidelines - Orthopaedic Practice

Definition

Angular deformity of the proximal tibia in which the child appears “bowlegged”

Pathogenesis/Natural History

- Contracture of the medial knee capsule due to in-utero position. During the first year of development this internal rotation contracture leads to external rotation of the entire lower limb and the clinical genu varum posture of the infant (3)
- Spontaneous resolution typically begins by 18-22 months, correction continues over the next 2-3 years and overcorrection to a maximum genu valgum is seen between 3.5- 4 years. The valgus angle then decreases to the adult degree of valgus between 7 and 11 years of age. (3)

Clinical Presentation

Genu varum that has persisted after 18 months of age, usually pronounced by the child beginning ambulation

Evaluation

- Screen for developmental delay
- Family history: short stature, angular knee deformities?
- Has problem improved, gotten worse, stayed the same?
- Measure the child's height and weight
- Measurement of femoral-tibial angle
- Neuromuscular exam

Differential Diagnosis

- Hypophosphatemic Rickets
- Physiologic bowlegs
- Blounts
- Pseudoachondroplasia
- Focal fibrocartilaginous dysplasia
- Osteogenesis imperfect

Diagnostic Tests

- Radiographs
 - Severe genu varum for age
 - Height less than the 25th percentile
 - Excessive internal tibial torsion
 - Increasing genu varum
 - Unilateral/asymmetry of limb alignment
 - Lateral thrust
 - Pain
 - Abnormal hip exam

- Radiographic characteristics: AP standing lower extremities
 - Symmetrical involvement
 - Normal-appearing growth plate
 - Medial bowing that involves the proximal tibia and the distal femur
 - Metaphyseal/Diaphyseal Angle
- Laboratory Evaluation
 - CMP
 - CBC with differential
 - Ionized Calcium
 - PTH
 - 25 Hydroxy Vitamin D
 - I-25 Dehydroxy Vit D

Treatment Options

- Explanation of normal knee development
- Education
 - Explanation that shoe modifications and bracing are ineffective
 - Explanation that in an otherwise normal child, this condition will spontaneously correct itself
 - Review signs of developing genu varum for family to look for (ie unilateral, lateral thrust, worsening appearance, not resolving by age 2yo)

Follow up Recommendations

- Follow up with PA/NP as needed
 - if genu varum is deemed age/developmentally appropriate but PA/NP or family would like follow-up
 - 4 months if metaphyseal-diaphyseal angle between 10-15 degrees
- Referral to endocrine for abnormal laboratory evaluation (ie rickets)
- Follow up with surgeon
 - If metaphyseal/diaphyseal angle greater than 15 degrees and/or lateral thrust
 - Progressive
 - Underlying pathology causing genu varum

Evidenced Based Literature Review

1. Greene, W.B. (1996). Genu varum and genu valgum in children: Differential diagnosis and guidelines for evaluation. *Current Opinion in Pediatrics*, 22(1), 22-29.
2. Health, C.H. & Staheli, L.T. (1993). Normal limits of knee angle in white children-Genu varum and genu valgum. *Journal of Pediatric Orthopedics*, 13, 259-262
3. Do, T.T. (2001). Clinical and radiographic evaluation of bowlegs. *Current Opinion in Pediatrics*, 13(1), 42-46.
4. Zions, L.E. & Shean, C.J. (1998). Brace treatment of early infantile tibia vara. *Journal of Pediatric Orthopedics*, 18(1), 102-109.