

Osgood Schlatter Disease In Young Athletes

See also: Osgood Schlatter Disease (Peds)

Background

1. Definition:

- Traction injury of apophysis at proximal tibial tuberosity

Pathophysiology

1. Pathology of dz

- Traction injury of proximal tibial tubercle at insertion of patellar tendon
 - Secondary to repetitive strain
 - Causes chronic avulsion of secondary ossification center of tibial tuberosity
 - An overuse syndrome

2. Incidence/ prevalence

- Affects nearly 20% of adolescent athletes
- 5x greater incidence in pts active in sports
- 2-3x greater incidence in boys
- Bilateral in 20-50%

3. Risk factors

- Recent rapid growth spurt
 - Boys 13-14 yrs old
 - Girls 11-12 yrs old
- Participation in jumping sports
 - Gymnastics
 - Basketball
 - Soccer
 - Volleyball
- Patella alta, other patellar malalignment conditions

4. Morbidity/ mortality

- Avulsion fx through tibial tuberosity apophysis can occur (rare)
 - Most common in muscular males nearing maturity (age 14-17)
 - Usually during a jumping activity
 - Non-displaced can be managed in cast
 - Most require surgery

Diagnostics

1. History

- Anterior knee pain, incr gradually overtime
- Pain exacerbated by:
 - Quad activation
 - Running, jumping, weightlifting
 - Direct pressure
 - Kneeling, traumatic impact
 - Prolonged sitting w/knees flexed
- Pain relieved by rest
- Typically asymmetric
 - Bilateral in 20-50%

2. Physical exam

- Localized tenderness of tibial tuberosity
 - Soft tissue swelling w/prominent tibial tuberosity
 - Pain reproduced by:
 - Extending knee against resistance
 - Stressing quadriceps
 - Squatting w/knee fully flexed
 - Tight quadriceps, shortened hamstrings
 - Normal ROM at knee and hip
 - Stable knee and patellofemoral joints
 - Non-tender inferior pole of patella
 - Test w/knee extended and patellar tendon relaxed
 - Tenderness suggests Sinding-Larsen-Johansson dz
 - Tenderness w/palpation decreases with knee flexed to 90° / patellar tendon taut
3. Diagnostic testing
- Dx made based on clinical exam, no imaging required
 - Optional imaging
 - X-Ray (AP & lateral)
 - Obtained to r/o other pathologic conditions
 - Tibial apophyseal fx, tumor, osteomyelitis
 - Consider in pts w/atypical complaints or pain not directly over tibial tuberosity
 - Findings often nonspecific
 - Soft tissue swelling
 - Elevation of tubercle
 - Tubercle irregularity, fragmentation, or incr density
 - Ossicle or calcification w/in patellar tendon
 - Ultrasound
 - Can show early soft-tissue/ cartilaginous changes
 - Swelling
 - Fragmentation of ossification center
 - Thickening of patellar tendon
 - Retropatellar bursitis

Differential Diagnosis

1. Key DDx

- Jumper's knee (patellar tendonitis)
- Patellofemoral pain syndrome
- Stress fx of proximal tibia
- Infection
 - Look for erythema, induration, elevated sedimentation rate
- Neoplasm (rare, unilateral)

2. Extensive DDx

- Patellar subluxation or dislocation
- Patellar tendon avulsion
- Sinding-Larsen-Johansson
 - Traction apophysitis of inferior patellar pole
- Osteochondritis dissecans
- Hip pathology

- Slipped capital femoral epiphysis
- Legg Calve Perthes dz
- Inflammation of plica
 - Normal folds in synovium of knee
- Hoffa dz of anterior fat pad

Therapeutics

1. Acute treatment

- Most cases benign/ self-limited
- Symptom duration: wks to 18 mos
- Conservative mgmt
 - Ice after activity (SOR:B)
 - NSAIDs (SOR:B)
 - Relative rest from offending activities (SOR:B)
 - Protective knee pads
 - May help w/direct trauma
 - Patellar bands (Chopat) may be helpful (SOR:C)
- Continued sports participation encouraged

2. Further mgmt

- Severe symptoms
 - Relative rest to allow healing of microscopic avulsion fxs
- Modify activity level until symptoms subside
- Knee immobilizers are contraindicated in mild dz
 - In mild dz worsens outcome leading to atrophy of quadriceps and hamstrings
 - May be necessary in recalcitrant or severe cases (SOR:C)
- Corticosteroid injections are not recommended (SOR:C)
- Surgical intervention may be necessary in chronic cases
 - Particularly if bony or cartilaginous ossicles (SOR:C)

3. Long-term care

- Physical therapy rehabilitation including:
 - Quadriceps and hamstring stretching
 - Progressive quadriceps strengthening

Follow-Up

1. Return to office

- Routine follow up in 2-4 wks to monitor improvement
- Follow up earlier if symptoms acutely worsen

Prognosis

1. Excellent w/conservative mgmt (>90% self limited)

- Condition subsides w/closure of proximal tibial growth plate at skeletal maturity
- Residual prominence of tibial tubercle may occur
 - More common in cases w/fragmentation of epiphysis or heterotopic ossification

Prevention

1. Strengthening and improving flexibility of quadriceps, hamstring, iliotibial band, gastrocnemius muscle

References

1. Bloom OJ, Mackler L. What is the best treatment for Osgood-Schlatter disease? J Fam Prac 2004 Feb;53(2):153,156.
2. Calmbach, WL, Hutchens, M. Evaluation of Patients Presenting with Knee Pain: Part II. Differential Diagnosis. Am Fam Physician 2003; 68, 917.
3. Dunn JF. Osgood-Schlatter disease. Am Fam Physician 1990 Jan;41(1):173-6.
4. Gholve PA; Scher DM; Khakharia S; Widmann RF; Green DW . Osgood Schlatter syndrome. Curr Opin Pediatr. 2007 Feb;19(1):44-50.
5. Krause BL; Williams JP; Catterall A . Natural history of Osgood-Schlatter disease. J Pediatr Orthop 1990 Jan-Feb;10(1):65-8.
6. Kujala UM; Kvist M; Heinonen O. Osgood-Schlatter's disease in adolescent athletes. Retrospective study of incidence and duration. Am J Sports Med 1985 Jul-Aug;13(4): 236-41.
7. Osgood-Schlatter Disease. In: Essentials of Musculoskeletal Care, 3rd edition, Griffin, LY (Ed), American Academy of Orthopaedic Surgeons, Rosemont, IL 2005. p. 913.

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