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 fxss
   - 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

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