Scheuermann's Disease

See also Back Pain (Peds)
See also Scoliosis

Background
1. Definition:
   - Structural deformity of spine
   - Most common cause of hyperkyphosis in adolescents
   - Causes a progressive, rigid kyphosis
   - Usually in thoracic region
   - Typical (Classic) Scheuermann's
     - Hyperkyphosis in thoracic spine with characteristic anterior wedging of 3 or more adjacent vertebral bodies
     - Most common
   - Atypical Scheuermann's
     - Located in lumbar spine or thoracolumbar junction
     - Causes decreased lordosis
     - May involve fewer vertebral segments
2. General information
   - Usually discovered at first pubertal growth spurt
   - Deformity progresses until skeletal maturity
     - Symptoms freq resolve when progression of curve ceases
   - Often associated with non-structural hyperlordosis of lumbar spine and scoliosis below kyphosis
     - Seen in 1/3 of cases
   - Serious complications rare, seen with more severe kyphosis
     - Thoracic cord compression
     - Pulmonary compromise

Pathophysiology
1. Osteochondritis of vertebral body ring apophysis
   - Causes decreased anterior growth and vertebral wedging
   - Etiology unknown
2. Theories incl
   - Avascular necrosis of ring apophysis
   - Herniation of disc material into vertebral body
   - Abnormal collagen matrix of vertebral endplate cartilage
   - Osteoporosis
3. Strong genetic component suggested
4. Repetitive stress/trauma a factor
   - Hard laborers
   - Athletes
5. Incidence/prevalence
   - 1-8% of general population
   - Most common cause of hyperkyphosis in adolescence
   - Average age at dx 11-14 yrs
   - Equal in males and females
     - Lumbar Scheuermann's more common in male athletes 2:1
6. Risk factors
Athletic populations susceptible
- Classic: Aquatic ski jumpers
  - Repetitive flexion and axial loading
- Atypical (lumbar): sports requiring repetitive flexion/extension
  - Football
  - Wrestling
  - Weight lifting
  - Gymnastics
  - Diving

Diagnostics
1. History
   - Chief complaint
     - Adolescents present with concerns about deformity
     - Adults present with back pain
   - HPI
     - Back fatigue especially end of day
     - Pain exacerbated by sitting, standing, exercise
     - Classic Scheuermann's
       - Back pain located at or below apex of kyphosis
     - Atypical Scheuermann's
       - Back pain at involved segment
       - Participation in sports or occupation involving repeated flexion/extension or axial loading of spine
       - Onset of puberty with recent increase in growth rate
     - Pts with severe kyphoses may report
       - Neurologic symptoms
         - Spastic paraparesis
         - Gait disorder
         - Lower extremity numbness
         - Clonus
       - Respiratory compromise (curves >100°)

2. Physical examination
   - Hyperkyphosis in thoracic region
     - Deformity exacerbated in flexion
   - Kyphosis does not resolve with hyperextension of spine
     - Differentiates Scheuermann's from postural kyphosis
   - Sharply angular kyphoses
     - Perform lower extremity neurological exam
     - Assess cardiopulmonary status
   - Check for compensatory lumbar hyperlordosis and mild scoliosis below kyphosis
   - Atypical Scheuermann's
     - Decreased lumbar lordosis

3. Diagnostic studies
   - Standing A-P and lateral radiographs of thoracic or lumbar spine based on location of abnormal curve and symptoms

4. Diagnostic criteria
   - Anterior wedging of >5° of 3 or more adjacent vertebrae
4.1.08

- Kyphosis >45° by Cobb angle (upper range of normal = 40-45°)
- Vertebral endplate irregularities
- Disc space narrowing
- Schmorl's nodes
  - Caused by herniation of disk material into vertebral body
- Atypical Scheuermann's
  - Decreased lumbar lordosis or flattening at thoracolumbar junction
  - Anterior wedging may involve fewer than 3 vertebrae
- Young pt w/low back pain
  - Oblique views of lumbar spine to r/o spondylolysis/ spondylolisthesis (SOR:C)
- MRI thoracic/ lumbar spine
  - If pt has neurologic symptoms suggestive of cord compression/ disc rupture
  - To define anatomy for surgical intervention

**Therapeutics**

1. Indications for tx
   - Pain
   - Progressive deformity
   - Neurologic symptoms
   - Cardiopulmonary compromise
   - Cosmesis
2. Initial tx
   - Rest
   - NSAIDs or non-narcotic analgesics
   - Postural and flexibility exercises
   - Physical therapy
3. Bracing: indicated in skeletally immature ps w/curves >50-60°
   - Modified Milwaukee Brace (CTLSO)
     - 20 hrs/day for 12-18 mos
     - May be removed for athletic activity
     - Continue wearing brace 12 hrs/day until skeletally mature
   - Lumbar (atypical) Scheuermann's
     - Hyperextension lumbar spinal orthotic for 3-12 mos
   - Athletes
     - Brace w/15° of lordosis plus
     - Rest, NSAIDs, PT
     - May return to play in 1 month
4. Surgical indications
   - Pain
   - Poor cosmesis
   - Cardiopulmonary difficulty
   - Neurologic compromise
   - Failure of brace tx
   - Usually for curves >75° w/unacceptable pain/ deformity
   - Surgical techniques
     - Anterior release
     - Posterior instrumentation/ fusion
- Combined approach
  - Pts should be immobilized for several mos
  - W/hold from athletics (except swimming) for 1 yr after surgical correction

**Follow-up/ Prognosis**

1. Radiographic exam every 4-6 mos in growing child to monitor curve progression
2. Consider orthopedic consult for curves >50°
3. Prognosis good
  - Pts report more back pain
    - But do not require more analgesia or miss more days of work than unaffected population
  - Studies show mild improvement of kyphosis and slowed progression w/bracing (SOR:C)
  - Surgical: usually results in significant improvement of deformity

**Prevention**

1. Young athlete w/back pain >3 wks warrants radiographic evaluation (SOR:C)

**Patient Information**


**References**


**Authors:** Thomas Sargent, MD, & Jennifer Naticchia, MD, Christiana Care Health Services, Wilmington, DE

**Editor:** Carol Scott, MD, University of Nevada Reno FPRP