



Lumbar Back Pain in Young Athletes

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Lumbar Back Pain in Young Athletes

Learning Objectives

- Epidemiology
- Anatomy
- History
- Physical Exam
- Imaging
- Diagnosis
- Treatment
- Return to Play





Lumbar Back Pain in Young Athletes

Differential Diagnosis

- Lumbosacral Sprain
- Lumbar Somatic Dysfunction
- Lumbar Spondylolysis
- Lumbar Spondylolithesis
- Scoliosis
- Lumbar Scheuermann's Disease
- Juvenile Rheumatoid Arthritis
- Ankylosing Spondylitis
- Malignancy
- Disk herniation
- Apophyseal Ring Fracture
- Congenital Abnormalities



Lumbar Back Pain in Young Athletes

Epidemiology

- Each year in US over 30 million children and teenagers participate in organized sports
- Sports are the leading cause of injury in adolescents
- Chronic overuse injuries are increasing in young athletes
- Incidence of back pain among young athletes participating in sports has been shown to be twice as high as in the general population of the same age

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Bone

- 5 Lumbar Vertebrae
- Sacrum
- Sacroiliac Joint
- Facet Joints

Anatomy



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Muscle

- Latissimus dorsi
- External abdominal oblique
- Gluteus medius/maximus
- Serratus
- Internal abdominal oblique
- Erector spinae
- Multifidus and rotatores
- Quadratus lumborum
- iliopsoas

Anatomy



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Ligament

- Supraspinous ligament
- Interspinous ligament
- Ligamentum flavum
- Posterior longitudinal ligament
- Anterior longitudinal ligament

Anatomy

- Posterior longitudinal ligament runs vertically and posterior to vertebral body providing structure and support
- Remember the posterior longitudinal ligament begins to narrow in the lumbar spine
- Incidence of lumbar spine herniations is greater for lower lumbar vertebrae

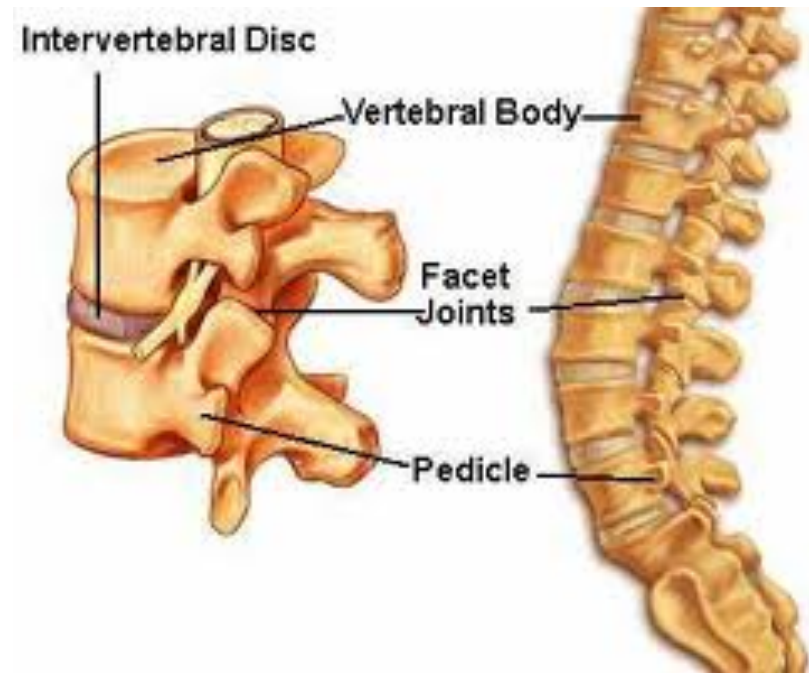
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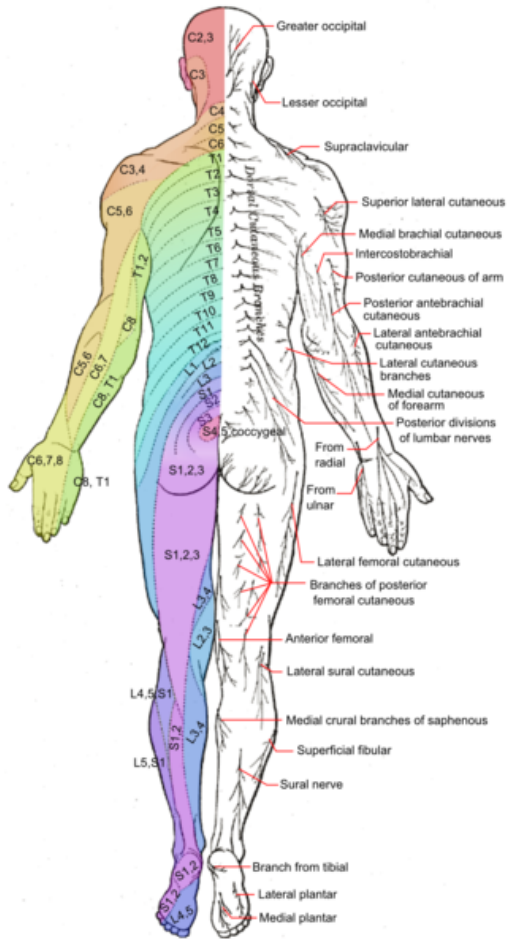
Anatomy

Spinal Nerve

Intervertebral Disc



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History

- Age & Sex
- Type of activity or sport
- Amount of training/participation per day/week/year
- Chronicity, timing, location, quality and severity of symptoms
- Any associated symptoms: fever, weight loss, night pain
- Activities that worsen or improve symptoms
- Limitations in participation
- Medical, Surgical, Family history



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Physical

- Visual inspection
- Palpation
- Range of motion
- Strength
- Neurologic assessment
- Vascular assessment
- Gait assessment
- Special Tests
 - Standing flexion test
 - Seated flexion test
 - Dural tension tests
 - Patrick test
 - Stork test
 - Thomas test



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Diagnosis

Somatic Dysfunction

- Osteopathic physicians can treat this condition simultaneously using both conventional primary care approaches and complimentary spinal manipulation
- OMT is safe and effective
- OMT is billable



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Diagnosis

Lumbar Somatic Dysfunction

- Tissue Texture abnormality, Asymmetry, Restriction of motion, and Tenderness (TART)
- 3 most commonly used OMT techniques: soft tissue, HVLA, and muscle energy
- Major motion of the lumbar spine is flexion/extension

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Somatic Dysfunction



- Psoas Syndrome (flexion contracture)
 - Presents as low back pain that radiates to groin
 - Associated with somatic dysfunction L1 or L2, sacral dysfunction
 - Counterstrain effective for acute symptoms
 - Stretching an acute psoas spasm may exacerbate symptoms
 - Treat the higher Lumbar SD with muscle energy or HVLA

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Somatic Dysfunction

- Innominate Somatic Dysfunction
 - Same side as positive standing flexion test
 - Rotation occurs about the inferior transverse axis
 - Muscle energy is effective



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Somatic Dysfunction

- Sacral Somatic Dysfunction
 - Associated L5 somatic dysfunction
 - Treat L5 somatic dysfunction first
 - Muscle Energy and HVLA techniques are effective
 - Positive seated flexion test is opposite the sacral oblique axis
 - Rotation of L5 and sacrum are opposite
 - L5 SB and sacral oblique axis will be same side



Case Study

- 17 year old cross country runner
- CC: low back pain
- Pain is sharp does not radiate and began yesterday after 5 mile run
- Exam
 - positive standing flexion test on right
 - Right ASIS inferior
- Diagnosis
 - Right anterior innominate
- Treatment
 - OMT Muscle Energy



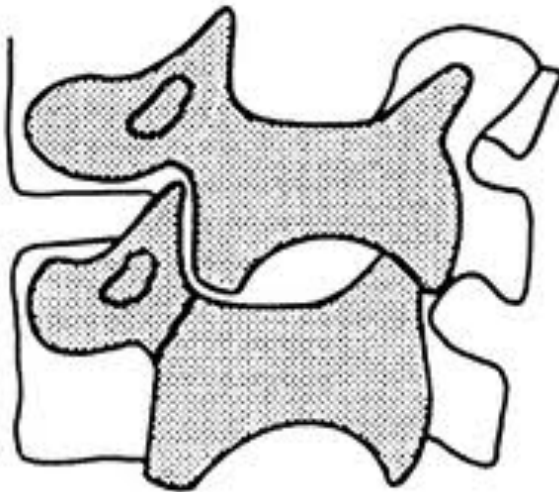
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Diagnosis

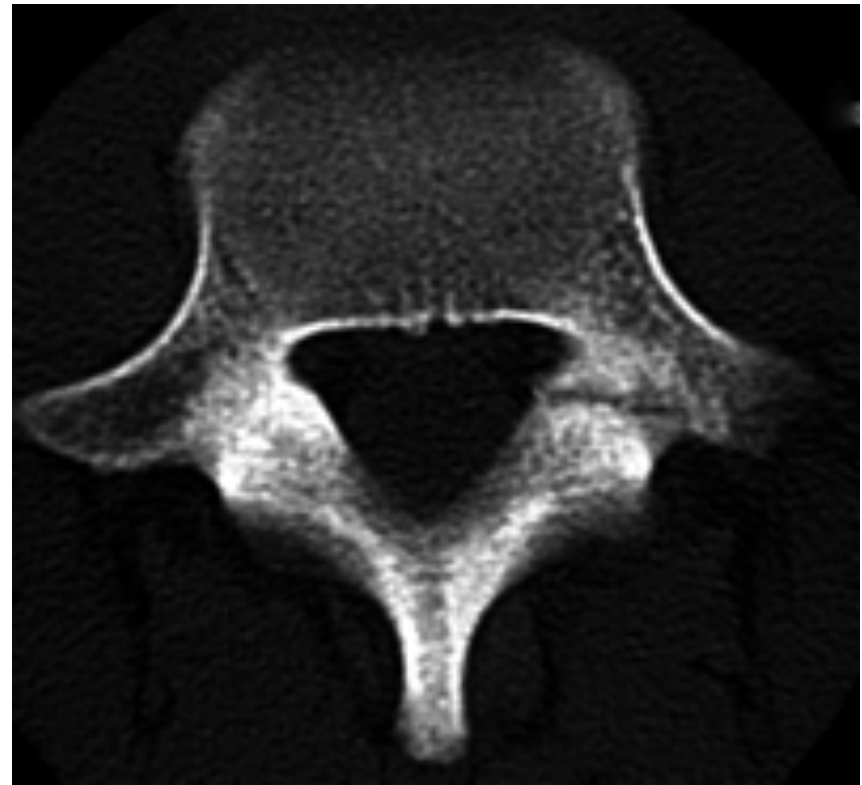
Spondylolysis

- Pars interarticularis defect/
stress fracture
 - History
 - Exam
 - The Stork Test
 - Imaging
 - Lateral oblique x-rays (scotty dog)
 - SPECT scan
 - CT

Can you find the collar of the Scotty Dog?



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Lumbar Back Pain in Young Athletes

Diagnosis

Spondylolysis

- Pars interarticularis defect/
stress fracture
 - Treatment
 - Restrict sport activity
 - Brace
 - » TLSO
 - Bone stimulator
 - Rehabilitation



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Diagnosis

Spondylolysis

- Pars interarticularis defect/
stress fracture
 - Prognosis
 - » Unilateral Pars defects are more likely to have bone healing
 - » Fibrous union allows the majority of athletes to return to sport
 - Return To Play
 - » Varying time frames in the literature
 - » Consensus: 6 months return to sport

Case Study

- 17 year old Junior HS football (defensive cornerback) and T&F (sprinter) athlete presents complaining of LBP.
- Pt. was seen by his pediatrician for left sided LBP after squatting with heavy weight in the spring, had “normal” x-rays, received PT/Rehab and improved
- He presented with LBP complaint again in late summer after the first week of football two-a-days: chief complaint was right sided LBP
- Exam: Neurologically ->no deficits, Musculoskeletal B/L hamstring contracture, excellent balance, pain with extension and positive Stork test B/L

Case Study

- Lateral oblique X-ray: pars defect on the left without spondylolithesis,
- SPECT scan positive B/L L5 uptake
- CT scan confirmed spondylolysis B/L L5 without spondylolithesis
- Management: removed from contact sport, back brace (TLSO) and bone stimulator
- We had long discussion that his football season was over for this year.
- Pt. was non-compliant with treatment plan.
- Repeat 3 month CT scan showed no change; B/L spondylolysis of L5 without spondylolithesis.

Case Study

- Patient began intensive PT/ Rehab
- He was released to participate in T&F in the spring
- He is currently pain free and playing in his senior year of HS football





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Diagnosis

Spondylolisthesis

- The anterior or posterior displacement of a vertebra in relation to the vertebra below
- 5 types
 - Dysplastic
 - Isthmic
 - Degenerative
 - Traumatic
 - Pathologic



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Diagnosis

Spondylolisthesis

- Grade I-V based on percentage of forward slip as seen on lateral radiographs
 - Grade I (0%-25%)
 - Grade II (26%-50%)
 - Grade III (51%-75%)
 - Grade IV (76%-100%)
 - Grade V is Spondyloptosis

Spondylolisthesis

Grade ?



Grade ?



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Spondylolisthesis

- Return to Play
 - Most in this age group are Grade I
 - Follows same guidelines as spondylosis



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Scoliosis

- Classification
 - Congenital
 - Idiopathic
 - Infantile
 - Juvenile
 - Adolescent
 - Neuromuscular
- History
 - Incidental finding on physical
 - USPSTF does not recommend routine radiographic screening for scoliosis
 - Physical
 - Standing flexion test

Scoliosis

Cobb Angle

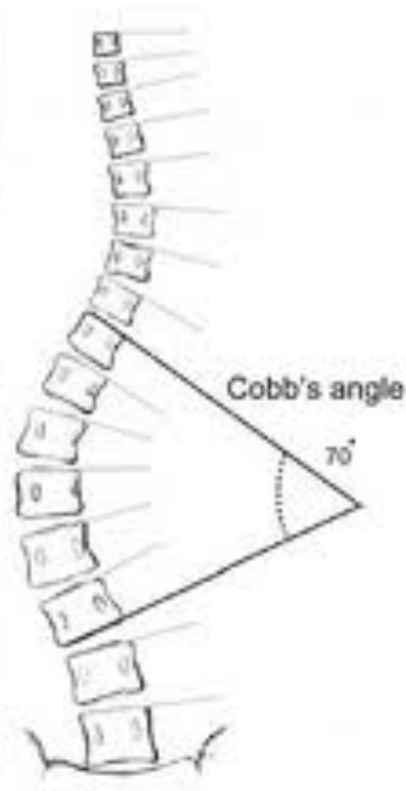
- Angle between two lines drawn perpendicular to the upper end plate of the upper most vertebra involved and the lower end plate of the lowest vertebra involved

Risser Stage

- The amount of calcification present in the iliac apophysis and measures the progression of ossification from antero-lateral to postero-medial

Scoliosis

Cobb Angle



Risser stage



Scoliosis



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Treatment

| Cobb | Risser | Treatment |
|-------|----------|-----------|
| 0-25 | Immature | Observe |
| 25-30 | Immature | Brace |
| 30-40 | Immature | Brace |
| >40 | Immature | Surgery |
| >50 | Mature | Surgery |

Return to Play

- Dependant upon treatment
 - Observe no restriction
 - Sport restriction while in brace
 - Surgery is multi-disciplinary approach



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Questions?