Lumbar Back Pain in Young Athletes

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San Diego CA
AOASM
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1:00pm
Lumbar Back Pain in Young Athletes

Learning Objectives

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

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Differential Diagnosis

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

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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
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Anatomy

Muscle

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

Intervertebral Disc

Anatomy

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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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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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- 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

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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

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Can you find the collar of the Scotty Dog?
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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 spondylololithesis,
• 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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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 spondyloysis
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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

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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

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Cobb Angle

Risser stage

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Scoliosis

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#### Treatment

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<thead>
<tr>
<th>Cobb</th>
<th>Risser</th>
<th>Treatment</th>
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<tbody>
<tr>
<td>0-25</td>
<td>Immature</td>
<td>Observe</td>
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<td>Immature</td>
<td>Brace</td>
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<td>30-40</td>
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<td>Surgery</td>
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<td>Mature</td>
<td>Surgery</td>
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#### Return to Play

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

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Questions?