The Athlete’s Lumbar Spine: Current Concepts

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Financial Disclosure
Dr. Ajeya Joshi has disclosed that he has ownership interest from Phygen and SpineSmith; he also receives non-CME service fees from Eli Lilly, Inc.

Speaker Background
• Spine Surgeon, South Texas Spinal Clinic
• Clinical Associate Professor, UTHSC-SA
• Spine training: Baylor (Houston)
• In practice in San Antonio 8+ years
### Content / Objectives

- On-field screening ‘red flags’ and management
- Low back pain
  - Epidemiology
  - Trends
  - Treatments
  - **Prevention**
- Spinous process / transverse process fractures

### Content / Objectives

- Spondylolysis (pars fractures) updates
- Hot topics / On the horizon...

### Acute / Traumatic (Fall, Collision)

- Look for on-the-field ‘Red Flags’:
  - Weakness, incontinence, cannot stand or jog, impaired flexibility, loss of consciousness
  - (Concussion, upper extremity weakness, all part of head/neck/spine broader trauma considerations)
Neurologic Testing

- L2 Hip flexors (iliopsoas)
- L3 Knee extensors (quadriceps)
- L4 Ankle dorsiflexors (tibialis anterior)
- L5 Long toe extensor (extensor hallucis longus)
- S1 Ankle plantiflexors (gastrosoleus)
- Grading Strength 0-5

Acute Injury Algorithm

- Red Flag finding = Assume structural problem (fracture / instability of the C-T-L5 spine)
- Expedite ER / spinal evaluation, with:
  - Spinal precautions (head-neck immobilization and spine board)
  - Advanced Trauma Life Support, ABCs

Athletes and Low Back Pain

- Trend / suggestion of higher incidence of LBP
  - Age, prior injury/LBP, females, Volleyball, time spent watching TV
  - My observations: MATCH/CONCUR
  - Significant lost time from athletic participation

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LBP Contributing factors

Acute LBP:
- Growth spurt
- Abrupt increases in training intensity or frequency
- Improper technique
- Unsuitable sports equipment
- Leg-length inequality

Chronic LBP:
- Poor core strength
- Structural issues (pars, disk)
- Tight hamstrings

Subacute or Chronic LBP
- Muscle strain/ligament sprain
- Degenerative disc disease
- Isthmic spondylodiscitis (no slip)
- Isthmic spondylolisthesis
- Facet syndrome
- Ring apophyseal injury (adolescents)
- Sacral stress fracture
- Central disc herniation (without radiculopathy)
- Sacralization of L5/tranverse process impingement
- Facet stress fracture
- Lumbar vertebral body fracture
- Discitis/osteomyelitis
- Neoplasm (CANCER)

Low Back Pain

- Treatment (strain, no fracture)
  - Core strengthening (PT)
  - Stretch Hamstrings
  - Short-term medications: anti-inflammatory (NSAIDs), muscle relaxant
  - Weight optimization
  - Lessen impact activities during acute symptoms
- Prevention
  - Sports-specific training
  - Rest
  - Manageable reps/goals
Spinous / transverse process injuries

- Typically not unstable
- Due to muscle pulling or direct impact
- Treat symptomatically
  - Brace, meds, PT
- Specialist to clear athlete as symptoms subside
- Flexion-extension x-rays on occasion

Spondylolysis

- aka pars fracture, stress reaction/fracture
- 3-6% prevalence
- Non-athletic population:
  - Often asymptomatic
  - Often incidental
  - Risk of slip: 25-50%
- May develop as stress fracture in athletics
- Adolescent athletes:
  - 38% with slip progression (avg. 10%)
  - 8% with slip decrease

Spondylolysis – Risks

- Twisting, hyperextension
- Repetitive axial loading
- Offensively linemen, gymnasts, soccer, baseball, volleyball, weightlifting, rowing, wrestlers...
Spondylolysis

- Tight hamstrings
- Pain with lumbar hyperextension
- Restricted range of motion
- ‘Stork’ Test

**Diagnosis - Imaging**
- Oblique films not useful; extra radiation
- Rely on SPECT bone scan + CT (radiation)
- MRI useful for excluding other processes (disk degeneration, herniation)

**Spondylolysis Scenarios and Treatment**
- **Spondylolysis (‘crack’, ‘stress fracture’)**
- Developing spondylolysis = ‘stress reaction’ (no crack...yet)

**Treatment of these two situations**
- Bracing (+/- 3 months), wean, rehab (CORE), ramp-up to sports
- Stable fibrous union with resolved symptoms is OK
- Check vitamin D ??? Doesn’t hurt...you’ll find low levels to Rx

**Future treatments...**
- External electrical stimulation
- Bone growth stimulators (external)(magnetic field)
- Oxygen-Dioxide CT guided therapy
- Hyperbaric oxygen?
On the horizon...

- Stem cells (mesenchymal stem cells)
- Adipose-based
- Bone marrow based
- Needs rigorous study...no great EBM to share with you at present
- Europe >>> U.S.

Dr. Jesse DeLee
Dr. Pablo Vazquez

Thank you!!

References


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