

The Athlete's Lumbar Spine: Current Concepts on Health and Injuries



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42th Annual Sports Medicine Symposium
January 23, 2015

I have disclosed that he has engaged in contracted research for CHRISTUS Santa Rosa and has ownership interest in Alphatec, Phygen.

Speaker Background

- Spine Surgeon, South Texas Spinal Clinic
- Clinical Associate Professor, UTHSC-SA
- Spine training: Baylor (Houston)
- In practice in San Antonio 10 years

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Content / Objectives

- On-field screening 'red flags' and management
- Low back pain
 - Epidemiology
 - Trends
 - Treatments
 - **Prevention**

Content / Objectives

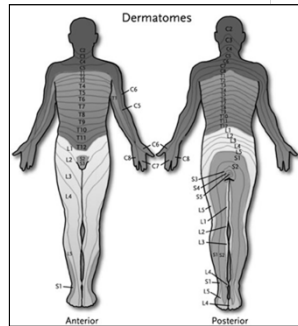
- Relevant new concepts in training
- Spondylolysis (pars fractures) updates
- Hot topics / Regenerative strategies...

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 (gastrocsoleus)
- Grading Strength 0-5



Acute Injury Algorithm

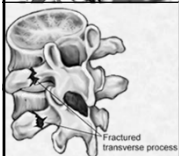
- Red Flag finding = Assume structural problem (fracture / instability of the C-T-LS spine)
- Expedite ER / spinal evaluation, with:
 - Spinal precautions (head-neck immobilization and spine board)
 - Advanced Trauma Life Support, ABCs



Case #1

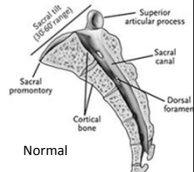


- 15 year old receiver
- In-game injury
- Complains of low back pain, lying on field
- Tries once, cannot get up (SEVERE pain) and/or weak in legs
- Management?
- Possible / likely injury?



You never know....

- 15 y.o. football player
- Hurt 2012
- Stopped playing
- PT 2013 for ongoing symptoms
- Now better
- But...



Athletes and Low Back Pain

- Trend / suggestion of higher incidence of LBP ¹⁵
 - Age, prior injury/LBP, females, Volleyball, time spent watching TV
- My observations: MATCH/CONCUR
- Significant lost time from athletic participation ⁶⁻⁸

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 | Intrapelvic, gynecologic conditions (e.g., ovarian cysts) |
| Degenerative disc disease | Renal disease |
| Isthmic spondylolysis (no slip) | |
| Isthmic spondylolisthesis | |
| Facet syndrome | |
| Ring apophyseal injury (adolescents) | |
| Sacral stress fracture | |
| Central disc herniation (without radiculopathy) | |
| Sacralization of L5/transverse process impingement | |
| Facet stress fracture | |
| Sacroiliac joint dysfunction | |
| Lumbar vertebral body fracture | |
| Discitis/osteomyelitis | |
| Neoplasm (CANCER) | |

Know your team, use the other parts of the team (i.e. triage problems, let someone help if you spot an issue).

Low Back Pain

- Treatment (strain, no fracture)
 - Core strengthening (PT).....**The Posterior Chain**
 - **Stretch Hamstrings**
 - Short-term medications: anti-inflammatory (NSAIDs), muscle relaxant
 - Weight optimization
 - Lessen impact activities during active symptoms
- Prevention
 - **Sports-specific training**
 - **Flexibility.... YOGA ??**
 - Rest
 - Manageable reps/goals



Flexibility



Even in (ESPECIALLY IN) football

Think outside the traditional box
i.e. Shannon Turley – Stanford Football

THE NEW YORK TIMES

HOME PAGE TODAY'S PAPER VIDEO MOST POPULAR U.S. Edition

College Football

floto MADE IN ITALY

Stanford's Distinct Training Regimen Redefines Strength



Recommended Video

#1 Reason the Average Golfer Can't Hit 200+ Yards... Watch Video

Buy Sports Tickets


Jan 8, 2013 Playoff Fan Center
Feb 10, 2013 2013 Super American Soccer League
Feb 10, 2013 Anthony Dallas Concerts & Events

Stanford's Distinct Training Regimen Redefines Strength
- New York Times, Dec. 30, 2013

'...For the subtle art of injury prevention, the Cardinal stretch and stretch and stretch. They stretch before and after lifts and before and after practice. They stretch for fun....'

© 2013 The New York Times Company

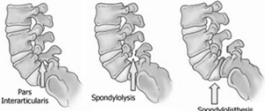

Case #2



- 16 y.o. club and HS volleyball player
- Nagging low back pain 5 months
- More sharp/severe last 2 months
- Focal low back pain
- Activity related
- Sitting out practice more frequently
- Wants to play but hurts, taking NSAIDs
- PT regimen / work through it?

Spondylolysis

- aka pars fracture, stress reaction/fracture
- 3-6% prevalence⁹⁻¹⁰
- 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 decrease¹¹



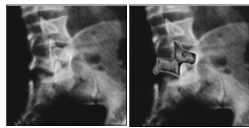
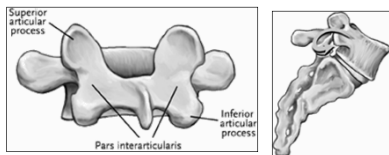
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Spondylolysis – Risks

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



Spondylolysis



Exam

- Tight hamstrings
- Pain with lumbar hyperextension
- Restricted range of motion
- 'Stork' Test – single leg stance, hyperextend back

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
- Relevant treatments...
 - External electrical stimulation
 - Bone growth stimulators (external)(magnetic field)
 - Oxygen-Ozone CT guided therapy
 - Hyperbaric oxygen?

The buzz...for disk injuries/degeneration

- Stem cells (mesenchymal stem cells)
 - Adipose-based
 - Bone marrow-based
- Needs rigorous study...evolving scientific information
- Europe >>> U.S.



Stem Cell Therapies

- 2000's: very little clinically; some bench research
- Now: increasing frequency of peer-reviewed clinical work

62. A Phase II Study Demonstrating Efficacy and Safety of Mesenchymal Precursor Cells in Low Back Pain Due to Disc Degeneration

Hyun W. Bae, MD et al.

STUDY DESIGN/SETTING: Multicenter, randomized, blinded, placebo-controlled trial comparing outcomes of a single intradiscal injection of adult allogeneic mesenchymal precursor cells (MPC) mixed with a hyaluronic acid (HA) carrier to saline placebo or HA carrier control injections in patients with chronic discogenic back pain.

NASS 2014

Stem Cell Therapies



Jesse DeLee
Pablo Vazquez



Thank you!!

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