Management of Lumbar Spine Injuries

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I have no disclosures
Lumbar Spine

- Younger athletes typically do not have adult problems
- Lumbar sprains/strains not as common in younger population
- Back pain that stops participation needs evaluation
Low Back Pain

• One of the most common reasons for missed playing time by professional athletes

• Published rates of low-back pain in athletes range from 1% to >30%

• Most cases are self-limited, many athletes have persistent symptoms
Epidemiology

- LBP accounted for loss of playing time by 30\% (forty-four) of 145 college football players
  McCarroll et al *AJSM* 1986
- 38\% of professional tennis players reported LBP as the reason for missing at least one tournament
- Ninety percent of all tour injuries in professional golfers involve the neck or back
  Duda *Phys SportsMed* 1989
- Highest in gymnasts, wrestlers & rowers
Differential Diagnosis

- Muscle strain/ligament
- Degenerative disc disease
- Isthmic spondylolysis (no slip)
- Sacroiliac joint dysfunction
- Facet syndrome
- Ring apophyseal injury (adolescents)
- Sacral stress fracture
- Central disc herniation (without radiculopathy)
- Sacralization of L5/tranverse process impingement
- Facet stress fracture
- Acute traumatic lumbar fracture
- Discitis/osteomyelitis
- Neoplasm
Non-operative Treatment

- Initial period of bed rest (no more than 3 days)
- NSAIDs
- Medrol dose pack
- Trunk stabilization program
- Epidural steroids
- Selective nerve root injections are effective and may avert surgery
Epidural steroid injection for lumbar disc herniation in NFL athletes.

Kych AU, Richman D, Drakos M, Weiss L, Barnes R, Cammisa F, Warren RF.

- NFL study
- 2003-2010
- 89% success rate RTP
- Avg loss time 2.8 practices (range 0-12), .6 games
- Failures: (Did not RTP)
  - Sequestration of disc herniation on MRI (p=0.01)
  - Weakness on PE (p = .002)
- Safe and effective
Microdiskectomy


- 14 elite athletes competing at NCAA level
- Mean age 20.7 yrs
- Sports:
  - Football (4)
  - Basketball (2)
  - Swimming (2)
  - Water polo (2)
  - Soccer, track & field, volleyball, diving
Microdiskectomy


- Minimum non-operative treatment period of 8 weeks
- 5 did not return to competition, 2 football
  - 2 single-level open discectomy
  - 3 two-level open discectomy
  - 1 percutaneous discectomy
- Of 9 who returned, one football player played 3 yrs at college level, rest still played professionally
Microdiscectomy Results

Watkins *Spine* 2003

- 60 Olympic & pro athletes had microdiscectomy
- Surgery criteria: HNP on MRI, leg pain with playing sport, failed 6 wks non-op treatment
- 53 (83%) returned to their sport, avg 5.2 months post-op
- All pts started on trunk stabilization and sport specific PT avg of 3 weeks post-op
## Return to Sport Rate

### Table 1

Return-to-sport rate and average time, by sport

<table>
<thead>
<tr>
<th>Sport</th>
<th>Total surgeries (N)</th>
<th>Return to sport (N)</th>
<th>Return to sport (%)</th>
<th>Average time (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ballet</td>
<td>1</td>
<td>1</td>
<td>100.0</td>
<td>2.0</td>
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<tr>
<td>Baseball</td>
<td>21</td>
<td>19</td>
<td>90.5</td>
<td>5.3</td>
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<tr>
<td>Basketball</td>
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<td>7</td>
<td>100.0</td>
<td>8.0*</td>
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<tr>
<td><strong>Football</strong></td>
<td><strong>20</strong></td>
<td><strong>15</strong></td>
<td>75.0</td>
<td>4.0</td>
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<tr>
<td>Hockey</td>
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<td>7</td>
<td>100.0</td>
<td>6.4</td>
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<tr>
<td>Olympians</td>
<td></td>
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<td></td>
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<tr>
<td>Ski</td>
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<td>1</td>
<td>100.0</td>
<td>3.0</td>
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<tr>
<td>Swim</td>
<td>1</td>
<td>1</td>
<td>100.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Water polo</td>
<td>2</td>
<td>2</td>
<td>100.0</td>
<td>3.0</td>
</tr>
</tbody>
</table>

*One athlete, 15 months; other six, 6.8 months.

*Watkins et al* *Spine* 2003
Adolescent Discectomy

- 72 patients 16yo or younger had lumbar discectomy
- 20 patients (28%) required revision surgery
- Of the other 50 patients, 46 noted occasional or no pain with activity Papagelopoulos et al JBJS 1998
Spondylolysis

- Defect within the bone of the posterior part of the neural arch
- Widely believed to be a stress fracture caused by repetitive loading, not a congenital defect
- Prevalence 3-6% in general population
- Athletes, variable
- Throwing athletes, divers, gymnasts, wrestlers, weight lifters & rowers

Soler, Calderon AJSM 2000
• 1025 adolescent athletes w LBP (15 +/- 1.8 y.o)
  – Hospital based Sports Medicine Clinic
• 308 – 30% Spondylolisis
  
  Boys
  - Baseball 54%
  - Soccer 48%
  - Hockey 44%

  Girls
  - Gymnastics 34%
  - Band 31%
  - Softball 30%

*Most common cause of LBP in adolescents
  - Incidence correlates w/ growth spurt
Spondylolysis

- Only 50% of oblique films will show the described “Scotty dog collar” sign.

Saifuddin et al *JBJS Br* 1998
Treatment

• Non-op for vast majority of patients

• Period of rest, PT

• Return to play when athlete is pain free
Bracing

- Serves as an anti-lordotic orthosis, prevent hyperextension
- The role and best type of external immobilization continue to be debated
- Immobilize for an initial 4-6 week period to allow for healing prior to activity/PT
Non-Operative Treatment

- 91% good to excellent results with 11 year follow-up, Miller at al AJSM 2004

- 80% good to excellent results with bracing & PT
Blanda et al *J Spinal Disorder* 1993

- 62 athletes with symptomatic spondylolysis, F/U 4.2yrs
- Treatment included restriction of activity and bracing for two to six months
- Fifty-two patients (84%) were reported to have an excellent result; eight (13%), a good result; and two (3%), a fair result
- 8 pts eventually had a fusion due to slip progression
Operative Treatment

- Indications for early surgical management are:
  - Neurologic deficit related to spondylolisthesis
  - Progressive slip
  - Grade-III or higher-grade slip at presentation

- These are independent of LBP
Operative Treatment

- Debnath et al. *JBJS Br* 2003
- 22 competitive athletes, prospective with repair of pars defect
- Best results with screw fixation
- 18/19 returned to sports
- All but 1 with wiring failed, none returned to sports
- Bracing not needed post-op for play
Unilateral Pars Defects

• Unilateral defect may lead to a 12 fold stress increase in contralateral pedicle and pars

• Up to 25% may have a contralateral stress fx

• Unilateral spondylolysis could lead to stress fracture or sclerosis at the contralateral side due to an increase in stresses in the region

• Suspect contralateral injury if LBP persists

Case 1

- 16yo female golfer with chronic progressive LBP and RLE pain

- Prior treatment: PT, NSAIDs, rest

- Pain prevented her from sports as well as activities as a teenager (school, social activities, etc)
Case 1
Outcome

- Surgery was a MIS Anterior/Posterior L5/S1 spinal fusion
- No Complications
- Discharged to home on POD#2
- Started swinging golf clubs at 4 weeks
- Pain free, has not felt better in many years
Case 2

- 53yo female nurse in L&D unit
- Chronic worsening LBP with R>L leg pain
- Limiting ability to exercise, increased pain with work
- PT, NSAIDs, ESI’s not helpful
X-Ray

16.1 mm
Post-Op
Outcome

• Pt returned to work in 3 months

• Now pain free, no meds

• Best she has felt in years
Return to Play

• Athlete should have significant improvement of symptoms to return to play

• Full strength & ROM documented

• Pain manageable enough to play without need of analgesics or abnormal movement patterns
Return to Play

- After Microdiscectomy
  - 6-8 weeks for non-contact sports
  - 4-6 months for contact sports

- Watkins Criteria
  1. The trunk stabilization program had been completed
  2. Excellent aerobic condition had been achieved.
  3. The athlete had returned to a satisfactory level of mastery of the skills necessary to perform in the sport.
  4. The stretching and strengthening exercises specific to that sport could be performed.
Return to Play

- Lumbar Fusion for spondylolysis will require 6-12 months of recovery for non-contact sports

- No data available for adult athletes undergoing spinal fusion for return to play

- Disc replacement likely not good option for contact sports
Summary

• Back pain that stops/limits participation needs evaluation
• Conservative tx often first choice
• Consider Spondylolisis in adolescent or extension sport athletes
• Are options for disc injury in athletes
  – Microdiscetomy
• Goal is RTP in appropriate time frame
BELIEVE