Back pain, Lumbar Spondylosis & Disc Prolapse

Kenan Deniz
Department of Neurosurgery
The General Infirmary at Leeds

26th February 2014
Summary

- Causes of LBP / patterns / red flags
- Facet joint disease
- Lumbar disc prolapse / CES
- Lumbar canal stenosis
- Spondylolisthesis & Fusion
Causes of low back pain

**Structural**
- Mechanical or non-specific
- Facet joint arthritis or dysfunction
- Prolapsed intervertebral disc
- Annular tear
- Spondylolisthesis or spondylolysis
- Spinal stenosis

**Neoplasm**
- Primary or secondary

**Referred pain to spine**
- From major viscera, retroperitoneal structures, urogenital system, aorta, or hip

**Infection**
- Discitis
- Osteomyelitis
- Paraspinal abscess

**Inflammatory**
- Spondyloarthropathies
- Sacroilitis or sacroiliac dysfunction

**Metabolic**
- Osteoporotic vertebral collapse
- Paget's disease
- Osteomalacia
- Hyperparathyroidism

BMJ 2004;328:1119-1121 (8 May)
Red flags in patients with low back pain

- Acute onset in elderly people
- Constant or progressive pain
- Nocturnal pain
- Fever, night sweats, weight loss
- Morning stiffness
- Bilateral or alternating symptoms
- Neurological disturbance
- Sphincter disturbance
- Immunosuppression
- Current or recent infection
- History of malignancy

- Claudicant symptoms, signs of peripheral ischaemia or abdominal mass

- Pain that is not improved with lying in the fetal position or prone with the stomach supported

BMJ 2004;328:1119-1121 (8 May)
Referral for back pain
Degenerative spinal disease - characteristics

- Cauda Equina: perineal numbness
- Stenosis: worse on walking, eased by sitting
- Nerve root pain: dermatomal pattern, neurological signs
- Mechanical pain: movement, posture
- Chronic pain: continuous time course, nebulous pattern
- Neural pain: continuous, varying severity, burning, numbness
Patterns of some back disorders

Pain worse with flexion
• Disc prolapse (plus neurological signs)
• Annular tear

Pain worse with extension and rotation
• Facet joint disorder
• Spondylolysis
• Localised buttock pain
• Sacroiliac disorder

Claudicant pain eased by flexion
• Spinal stenosis

Progressive bilateral neurological deficit and sphincter disturbance
• Central disc prolapse
• Cauda equina syndrome
• Cord compression
• Spinal vascular accident

BMJ 2004;328:1119-1121 (8 May)
Lumbar facet disease

- Postural back pain
- Often radiation to buttocks / upper thighs

- Management:
  - Analgesia
  - Physiotherapy
  - Facet joint injections

- Prevention – core stability
Facet joint injections

- Radiologically guided
- LA / steroid
- Variable response
- Can be repeated
- Therapeutic & Diagnostic
- Might fusion be beneficial?
Management of Lumbar Disc prolapse

- Analgesia
- Physiotherapy

- Surgery

The DBC Active Spine Care program
Cauda Equina Syndrome

- Sudden onset of
  - Bilateral leg pain
  - Urinary difficulty
  - Defaecation difficulty
  - Perineal sensory loss
# Cauda Equina Syndrome

<table>
<thead>
<tr>
<th></th>
<th>Back pain</th>
<th>Sciatica (uni/bi lateral)</th>
<th>Sphincter disturbance</th>
<th>Poor stream</th>
<th>Sensory change</th>
<th>Saddle anaesthesia</th>
<th>Loss anal tone</th>
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</thead>
<tbody>
<tr>
<td>CESR (with retention)</td>
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<td>✓</td>
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<td>✓</td>
<td>✓</td>
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<tr>
<td>CESI (Incomplete)</td>
<td>✓</td>
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<tr>
<td>CESS (Suspected)</td>
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<td>✓</td>
<td>✓</td>
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<td></td>
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</table>

- MRI local scan
  - 70% CESS show no central prolapse

- Referral
  - Surgery if long-term neurological morbidity can be reduced
“Referral to a medical specialist—for example, neurologist, rheumatologist, spine surgeon—is indicated in patients whose symptoms do not improve after conservative treatment for at least 6-8 weeks.”

**Box 4: Clinical guideline for diagnosis and treatment of sciatica from Dutch College of General Practice**

**Diagnosis**

Check for red flag conditions, such as malignancies, osteoporotic fractures, radiculitis, and cauda equina syndrome.

Take a history to determine localisation; severity; loss of strength; sensibility disorders; duration; course; influence of coughing, rest, or movement; and consequences for daily activities.

Carry out a physical examination, including neurological testing—for example, straight leg raising test (Lasègue’s sign).

Carry out the following tests in cases with a dermatomal pattern, or positive result on straight leg raising test, or loss of strength or sensibility disorders: reflexes (Achilles or knee tendon), sensibility of lateral and medial sides of feet and toes, strength of big toe during extension, walking on toes and heel (left-right differences), crossed Lasègue’s sign.

Imaging or laboratory diagnostic tests are only indicated in red flag conditions but are not useful in cases of suspected disc herniation.

**Treatment**

Explain cause of the symptoms and reassure patients that symptoms usually diminish over time without specific measures.

Advise to stay active and continue daily activities; a few hours of bed rest may provide some symptomatic relief but does not result in faster recovery.

Prescribe drugs, if necessary, according to four steps: (1) paracetamol; (2) non-steroidal anti-inflammatory drugs; (3) tramadol, paracetamol, or non-steroidal anti-inflammatory drug in combination with codeine; and (4) morphine.

Refer to neurosurgeon immediately in cases of cauda equina syndrome or acute severe paresis or progressive paresis (within a few days).

Refer to neurologist, neurosurgeon, or orthopaedic surgeon for consideration of surgery in cases of intractable radicular pain (not responding to morphine) or if pain does not diminish after 6-8 weeks of conservative care.
Indications for discectomy

• Leg pain (decompression)
• Disc prolapse coincides with neurology
• 6 weeks of failed conservative management
• Recurrent sciatica
• Fit for surgery

The controlled trial showed a statistically significant better result in the surgically treated group at the one-year follow-up examination. After four years the operated patients still showed better results, but the difference was no longer statistically significant. Only minor changes took place during the last six years of observation.
Weber’s Randomised patients

Group 1 consisted of:

• patients with sciatica
• not improved after 2 weeks of conservative hospital management who had
• radicular pain
  • “provoked by moderate exercise, by sitting position, or by increased abdominal pressure (coughing, sneezing, or defecation)
• restricted mobility of the spine
• defined scoliosis (tilt)
• positive straight-leg raising
• persistent weakness of muscle groups.”

Non-randomised groups

“definite indications for surgery”:

• severe and immobile scoliosis
• intolerable pain
• muscle weakness
  • sudden onset or progressive
• bladder/rectum paresis.”

Non-Surgical group:

• continuous improvement
  • (Ill-defined)

Weber 1 year

17 (25%) of conservative group went on to surgery
Weber 4 years

Analysis 12.02. Comparison 12 DISCECTOMY V. CONSERVATIVE ± DISCECTOMY, Outcome 02 Poor/bad result at 4 yrs - surgeon rated

Review: Surgical interventions for lumbar disc prolapse
Comparison: 12 DISCECTOMY V. CONSERVATIVE ± DISCECTOMY
Outcome: 02 Poor/bad result at 4 yrs - surgeon rated

<table>
<thead>
<tr>
<th>Study</th>
<th>DISCECTOMY</th>
<th>CONSERVATIVE + DISC.</th>
<th>Odds Ratio (Random)</th>
<th>Weight (%)</th>
<th>Odds Ratio (Random)</th>
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</thead>
<tbody>
<tr>
<td>Weber 1983</td>
<td>856</td>
<td>866</td>
<td>1.21 [0.42, 3.46]</td>
<td>100.0</td>
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<tr>
<td>Total (95% CI)</td>
<td>56</td>
<td>66</td>
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<td>100.0</td>
<td>1.21 [0.42, 3.46]</td>
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</tbody>
</table>

Total events: 8 (DISCECTOMY), 8 (CONSERVATIVE + DISC.)
Test for heterogeneity: not applicable
Test for overall effect z=0.35 p=0.7

### Analysis 12.03. Comparison 12 DISCECTOMY v. CONSERVATIVE ± DISCECTOMY, Outcome 03 Poor/bad result at 10 yrs - surgeon rated

**Review:** Surgical interventions for lumbar disc prolapse  
**Comparison:** 12 DISCECTOMY v. CONSERVATIVE ± DISCECTOMY  
**Outcome:** 03 Poor/bad result at 10 yrs - surgeon rated

<table>
<thead>
<tr>
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<th>DISCECTOMY</th>
<th>CONSERVATIVE + DISC.</th>
<th>Odds Ratio (Random)</th>
<th>Weight (%)</th>
<th>Odds Ratio (Random)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weber 1983</td>
<td>4/55</td>
<td>4/66</td>
<td>1.22 [0.29, 5.10]</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>Total (95% CI)</td>
<td>55</td>
<td>66</td>
<td></td>
<td>1000</td>
<td>1.22 [0.29, 5.10]</td>
</tr>
</tbody>
</table>

Total events: 4 (DISCECTOMY), 4 (CONSERVATIVE + DISC.)
Test for heterogeneity: not applicable
Test for overall effect z=0.27  p=0.8

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Long-term outcomes of surgical and nonsurgical management of sciatica secondary to a lumbar disc herniation: 10 year results from the Maine lumbar spine study.

Atlas SJ, Keller RB, Wu YA, Deyo RA, Singer DE.


• n=507
• 400 of 477 (84%) survivors had 10-year outcomes available
• Surgery: 217 of 255 (85%)
• Non-surgery: 183 of 222 (82%)

At 10 years:

<table>
<thead>
<tr>
<th>n=400</th>
<th>Surgery</th>
<th>Non-Surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predominant symptom</td>
<td>improved</td>
<td>69%</td>
</tr>
<tr>
<td></td>
<td>much better</td>
<td>56%</td>
</tr>
<tr>
<td>Satisfied with current status</td>
<td>71%</td>
<td>56%</td>
</tr>
<tr>
<td>At least one additional lumbar spine operation</td>
<td>25%</td>
<td>25%</td>
</tr>
</tbody>
</table>

• Work and disability status at 10 years were comparable among those treated surgically or nonsurgically.
The authors of the 2007 Cochrane review of surgical interventions for lumbar disc prolapse conclude that surgical discectomy for carefully selected people with sciatica provides faster relief from the acute attack than conservative management.
Surgical interventions for lumbar disc prolapse (Review)

Gibson JNA, Waddell G

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in The Cochrane Library 2007, Issue 4

http://www.thecochranelibrary.com

Epidemiological and clinical studies show that most lumbar disc prolapses resolve naturally with conservative management and the passage of time, and without surgery.

There is considerable evidence that surgical discectomy provides effective clinical relief for carefully selected patients with sciatica due to lumbar disc prolapse that fails to resolve with conservative management. It provides faster relief from the acute attack of sciatica, although any positive or negative effect on the long-term natural history of the underlying disease is still a lack of scientific evidence on the optimum.

The choice of micro- or standard discectomy at present probably depends more on the training and expertise of the surgeon, and the resources available, than on scientific evidence of efficacy. However, it is worth noting that some form of magnification is now used almost universally in major surgical units to facilitate vision.

At present, unless or until better scientific evidence is available, automated percutaneous discectomy, coblation therapy and laser discectomy should be regarded as research techniques.
Surgery versus Prolonged Conservative Treatment for Sciatica

- The 1-year outcomes were similar for patients assigned to early surgery and those assigned to conservative treatment with eventual surgery if needed.

- The rates of pain relief and of perceived recovery were faster for those assigned to early surgery.

Surgery versus prolonged conservative treatment for sciatica.

Surgical Versus Nonoperative Treatment for Lumbar Disc Herniation

- At 4-year follow-up, patients who had surgery for intervertebral disc herniation maintained greater improvement in all primary outcomes compared to those who remained nonoperative based on as-treated analyses.
- Except for work status, all secondary measures retained a significant benefit for surgery at 4 years.
- Work status showed a nonsignificant benefit for surgery at 4 years.
Discectomy or not?
50y male, Left L5 pain...

...discectomy?
Far Lateral Discs
Annular Tear
Lumbar stenosis

- Classical, no deficit
- Poor surgical risk
- Interspinous Distraction Device (X-Stop)

- Root pain, neurological deficit
- Failed IDD
- Laminectomy
Lateral recess stenosis

- Nerve root entrapment & radiculopathy
- Analgesia / Nerve root injection / Nerve root decompression
Indications for fusion

- Mechanical back pain
- Failed conservative measures
- Significant lifestyle restriction
- Fit for surgery

- Spondylolisthesis
Spondylolisthesis

- 4 Grades
- Progressive back pain
- Neurogenic claudication
- Radiculopathy
Spondylolisthesis - aetiology

Spinal instability

- Congenital – pars defect
- Trauma / surgery
Instability following discectomy
Thank you
<table>
<thead>
<tr>
<th>Nerve level</th>
<th>Motor innervation</th>
<th>Sensory innervation</th>
<th>Reflexes</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2</td>
<td>Hip flexors, thigh adductors</td>
<td>Upper thigh</td>
<td></td>
</tr>
<tr>
<td>L3</td>
<td>Quadriceps, knee extensors</td>
<td>Anterolateral thigh</td>
<td></td>
</tr>
<tr>
<td>L4</td>
<td>Knee extensors and foot dorsiflexors</td>
<td>Anteromedial calf</td>
<td>Patella, knee</td>
</tr>
<tr>
<td>L5</td>
<td>Foot and toe dorsiflexors (extensor hallucis longus)</td>
<td>Lateral calf, dorsum of foot</td>
<td></td>
</tr>
<tr>
<td>S1,2</td>
<td>Foot and toe plantar flexors</td>
<td>Lateral side of foot, sole of foot</td>
<td>Ankle</td>
</tr>
<tr>
<td>S2,3,4,5</td>
<td>Sphincters</td>
<td>Perianal and saddle</td>
<td>Bulbocavernosus</td>
</tr>
</tbody>
</table>

BMJ 2009;338:b936
Red flags for the cauda equina syndrome

• From medical history:
  – Saddle anaesthesia.
  – Recent onset of bladder dysfunction (distended bladder due to loss of bladder sensation; loss of bladder control due to loss of sensation when passing urine).
  – Recent onset of faecal incontinence (due to loss of sensation of rectal fullness).

• From physical examination:
  – Perianal/perineal sensory loss.
  – Unexpected laxity of the anal sphincter.
  – Severe or progressive neurological deficit in the lower extremities.
    • Major motor weakness with knee extension, ankle eversion, or foot dorsiflexi

http://www.cks.nhs.uk/back_pain_low_and_sciatica/management/detailed_answers/red_flags_for_serious_conditions