Approach to Chronic Back Pain

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Back pain

• Most common questions patients ask me in my office:

  • “Why is it bothering me?”

  • “Is there anything that can be done?”

Objectives

• Background
• Anatomy
• Etiology
• Treatments

Background

• In United States –

  • Approximately 10 million Americans are disabled from chronic low back pain

  • 250 million workdays are lost per year due to chronic low back pain

  • Annual incidence of 10-15% of adult population suffer moderate intensity low back pain

    – Typically self limited with > 90% recover over 3 months

    – Remainder 10% have intensive demands and utilize significant healthcare resources

Costs

- Low back pain – 5th most common reason for physician visits
- In 1998:
  - Total incremental direct healthcare costs due to low back pain were $26.3 billion dollars
  - Indirect costs from days lost from work: approximately 2% of US work force compensated for back injuries per year.
- Approximately 5% of patients with low back pain disability account for 75% of costs associated with low back pain


Timing

- Low back pain categorized –
  - Duration, location, etiology
- Acute – 2-4 weeks
- Subacute - < 12 weeks
- Chronic - > 12 weeks


Evaluation

- Focused history
  - Back pain
  - With or without leg pain
  - Other associated symptoms
- Assess risk factors
  - Medical comorbidities
  - Psychological factors
- Focused physical examination
  - Neurological deficits


Evaluation

- Eradication of back pain is rare
- Psychological evaluation
  - Back pain is multifactorial
  - Emotional, cognitive, behavioral, social and employment

Anatomy

• Spine is composed of 30 vertebra
  – Tripod structure: 2 facets and 1 disc
• Spine consists of the muscles, tendons and ligaments
• Pain can come from ANY of the structures

Objectives

• Background ✔
• Anatomy ✔
• Etiology
• Treatments

Etiology

• Disc herniation
• Spinal stenosis
• Degenerative spondylolisthesis
• Spondylolysis with spondylolisthesis
• Lumbar sprain or strain
• Degenerative changes
• Fracture
• Tumor
• Infection

Nonspecific back pain

• Lumbar strain or sprain
• Degenerative changes

• Patient education imperative
  – Condition is self limited
  – Remain active

Approach

- Multidisciplinary approach
  - Physical therapist
  - Pharmacological treatment
  - Nonpharmacological treatment
  - Cognitive behavioral therapy
  - Invasive interventions


Physical therapy

- Physical therapy
  - Reconditioning
  - Strengthening
  - Range of motion
  - Low impact aerobic activity
  - Williams’s flexion exercises, McKenzie exercises
  - Aqua therapy
  - Heat/cold modalities
  - Bracing


Adjunctive therapies

- Adjunctive therapies
  - Acupuncture
  - Transcutaneous electrical nerve stimulation (TENs)
  - Massage therapy
  - Behavioral therapy/biofeedback
  - Yoga/traction


Medications

- Pharmacologic management
  - Nonsteroidal anti-inflammatory drugs (NSAIDs)
  - Nonopioid analgesics
    - Tylenol, tramadol
  - Opioid analgesics
  - Antidepressants
    - Tricyclic antidepressants
      - Affect serotonin and noradrenaline
  - Muscle relaxants
  - Gabapentin

Procedures

• Invasive procedures
  - Epidural steroid injections
  - Facet joint injections
  - Trigger point injections
  - Radiofrequency procedures
  - Sacroiliac joint procedures

*Surgery typically not beneficial for nonspecific back pain*

Etiology

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Disc herniation

• Extrusion of disc material with compression of nerve

• Presentation includes:
  - Leg pain in the distribution of nerve that is under compression
  - With or without complaints of weakness in myotomal distribution
**Disc herniation**

- Physical examination findings:
  - Assess straight leg raise
  - Assess sensation
  - Assess strength

**Disc herniation…Treatment**

- Nonoperative treatment
  - No significant weakness on examination
  - Physical therapy
  - Medications
  - Injections
- Typically 6 weeks

**Disc herniation**

- Operative treatment
  - Microdiscectomy

**Lumbar spinal stenosis**

- Compression of the caudal nerve roots

- Etiology
  - Degenerative
  - Congenital

- Anatomy
  - Disc protrusion
  - Ligamentum flavum hypertrophy
  - Facet hypertrophy
Lumbar stenosis

- Presentation includes:
  - *Neurogenic claudication*
  - Buttock and leg pain and/or paresthesias with standing/walking
  - Decreased walking tolerance
  - Improvement with sitting or forward flexion

- Red flags for cauda equina:
  - Bowel incontinence
  - Overflow urinary incontinence
  - Weakness bilateral lower extremities
  - Saddle anesthesia

Lumbar stenosis

- Physical examination findings:
  - Often normal physical examination

Lumbar stenosis...Treatment

- Nonoperative treatment
  - No significant weakness on examination
  - Physical therapy
  - Medications
  - Injections

- Typically 6 weeks
Lumbar stenosis

- Operative treatment
  - Laminectomy

Degenerative spondylolisthesis

- Anterolisthesis of lumbar spine

- Etiology
  - Degenerative
  - Congenital
  - Pathologic
  - Traumatic
  - Iatrogenic
  - Pars defect

Degenerative spondylolisthesis

- Presentation includes:
  - Start up pain
  - Leg pain secondary to radiculopathy
  - May have symptoms of neurogenic claudication
Degenerative spondylolisthesis

- Physical examination findings:
  - Positive straight leg raise
  - Pain and/or paresthesias
  - Possible weakness

Treatment

- Nonoperative treatment
  - No significant weakness on examination
  - Physical therapy
  - Medications
  - Injections

  - Typically 6 weeks

Degenerative spondylolisthesis

- Operative treatment
  - Decompression with stabilization
  - Fusion is the biologic process

- Various surgical approaches
  - Posterior decompression with instrumented fusion
  - Lateral decompression with instrumented fusion
  - Anterior decompression with instrumented fusion
**SPORTs trial**

- Spine Patient Outcomes Research Trial
- Multicenter study with 13 sites
- 3 conditions studied
  - Disc herniations
  - Degenerative spondylolisthesis
  - Lumbar spinal stenosis
- Studied nonoperative vs. operative treatment
- Began March 2000

**SPORTs trial**

- Two armed study
  - Randomized arm
    - Patients watched shared decision making video and agreed to be put into randomized study
  - Observational arm
    - Patients unwilling to be randomized but did agree to participate in follow up evaluations

**SPORTs trial**

- Nonoperative treatments
  - Active physical therapy
  - Education with home exercise instruction
  - NSAIDS if tolerated.

**SPORTs trial**

- Operative treatments
  - Disc herniation: microdiscectomy or standard discectomy
  - Lumbar spinal stenosis: posterior decompressive laminectomy
  - Degenerative spondylolisthesis: Laminectomy with or without fusion
    - With or without iliac crest autograft
    - With or without instrumentation
**SPORTs trial**

- Objective outcome measures
  - SF-36
    - Physical function, mental health, general health, pain, physical limitations, emotional limitations, social functioning, vitality.
    - Higher scores indicate better outcomes
  - ODI
    - 10 questions: pain, getting dressed, lifting, walking, sitting, standing, sleeping, social, traveling, sexual activity
    - Higher scores indicate more disability

**SPORTs trial**

- Secondary outcomes measures
  - Preference based measures of current health
  - QALYs
  - Resource utilization
  - Direct inpatient costs
  - Direct outpatient costs
  - Indirect costs

**SPORTs trial…Summary**

- Disc hernation
  - Significant crossover in the randomized group
  - Both treatment groups maintained improvement at 8 year period
  - Patients who underwent surgery had significantly better self-reported outcomes than those with non-operative care in all categories except work status

**SPORTs trial…Summary**

- Degenerative spondylolisthesis
  - Patients improve with surgery more than with non-operative care at 4 years period
  - Use of instrumented fusion less clear in terms of overall benefit
  - Surgery for spondylolisthesis is more invasive, associated with higher blood loss and more complications
### SPORTs trial...Summary

- Lumbar spinal stenosis
  - Surgery was advantageous and results are persistent at 4 years period
  - Significant crossover in the randomized group

### SPORTs trial...Secondary outcomes

- For each group, cost per QALY (quality-adjusted life year) gained for surgery compared to nonoperative care improved at 4 years
- QALY is a complex calculation based on multiple assumptions
- The SPORT trial has been a valuable study even though crossover has affected the design

### SPORTs...Reference

- SPORT Outcomes: Herniated Disc
- SPORT Outcomes: Degenerative Spondylolisthesis
  - “Surgical Compared With Non-Operative Treatment for Lumbar Degenerative Spondylolisthesis: Four-Year Results in the Spine Patient Outcomes Research Trial Randomized and Observational Cohorts” JBJS 91:1295-1304, 2009.
- SPORT Outcomes: Degenerative Spondylolisthesis
- SPORT Outcomes: Cost Effectiveness Analyses

### Etiology

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Additional...

- ...causes of back pain
- Fracture
- Tumor
- Infection

Subacute L1 burst fracture

- 76 year old female who presents with 100% low back pain
- History reveals a fall 6 weeks ago with onset of back pain
Tumor

- 50 year old male who presents with 3 months history of low back pain and bilateral rib pain
- History reveals weight loss

Infection

- Typically insidious onset of back pain
- Risk factors predisposing to infection
  - Immunosuppression
  - Transplant
  - IV drug use

Summary

- Approach to back pain is multifaceted
- Identifying the etiology is important
- Education of the patient is necessary