Low Back Pain and Sciatica

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Low Back Pain: Epidemiology

- 60%–90% lifetime prevalence
- Second most common complaint to prompt a medical evaluation
- Leading cause of long-term work disability
- US healthcare costs: $33 billion/y
- Disability and costs related to pain, not to the disease process
Disk Herniation With Sciatica

- 90% of ruptured disks at L4-L5 and L5-S1
- 90% of patients with back pain and sciatica will recover without surgery
  - At least 50% within 6 wk
Low Back Pain and Sciatica: Nociceptive/Inflammatory Pain Mechanisms

- Activation and sensitization of the nerve root *nervi nervorum* from root compression/traction
- Sensitization of the nociceptors of the annulus fibrosus, periosteal spinal structures, and ligaments, due to acute inflammation, eg, status post trauma
- Hyperalgesia (deep spinal and dermatomal) due to central sensitization
Radicular and Discogenic Neuropathic Pain Mechanisms

- Ectopic activity of the nerve root *nervi nervorum*
- Sensitization and ectopic activity of the nociceptors innervating spinal periosteal structures, ie, annuli and ligaments
- Possible role of abnormal nociceptors overgrown within the intradiscal space, postsurgical epidural scars, degenerated facet joints
- CNS sensitization and reorganization
Failed-Back-Surgery Syndrome

Reoperations

- 60% due to post–spinal surgery complications
- 40% due to uncorrected or new structural abnormalities of the spine
Failed-Back-Surgery Syndrome

Postsurgical causes of back pain

- Recurrent or retained disk fragment
- Postoperative instability
- Dural adhesions
- Root injury
- Arachnoiditis
- Pseudomeningocele
- Failure to relieve the original pathologic condition
- Postoperative wound and disk infection
Back Pain and Sciatica: Comprehensive Assessment

• History
  – Medical
  – Psychosocial
  – Family
  – Previous trials

• General examination
  – Musculoskeletal
  – Neurologic
Back Pain and Sciatica: Pain Assessment

- Description
- Duration
- Intensity
- Alleviating factors
- Aggravating factors
Assessment of Patients With Low Back, Hip, and Leg Pain

- **Neurologic exam**
  - DTRs, strength, sensitivity, gait

- **Regional exam of spine and leg**
  - Inspection for scoliosis or skin rash, palpation for bone tenderness

- **Sciatic- and femoral-nerve stretching tests**
  - SLR, reverse and contralateral SLR maneuver
Assessment of Patients With Low Back, Hip, and Leg Pain

- **Provocative mechanical joint tests**
  - Truncal flexion for discogenic pain or spine instability
  - Truncal extension for facet joint disease
  - Patrick’s maneuver for hip disease (FABER test of both hips for SI joint disease)
Back Pain and Sciatica: Imaging Evaluation

- Lumbosacral x-ray studies with flexion/extension/oblique views
- MRI of the spine
- CT with 3-D reconstruction
- CT plus myelography
Assessment of Chronic Back Pain and Sciatica: Diagnostic Blocks

- Facet blocks to rule out facet joint pain
- Provocative diskograms or disk blockade to rule out discogenic pain and pain associated with segmental spinal instability
- Selective root blocks to determine location of root pain generator
Assessment of Acute Back Pain and Sciatica: “Red Flags”

History
- Nighttime pain, fever, weight loss, history of cancer
- Fever, IV drug abuse
- Bladder, bowel dysfunction; leg weakness
- Trauma

Possible Diagnosis
- Neoplasm
- Infection (diskitis, epidural abscess)
- Cauda-equina syndrome
- Compression Fx
Back Pain and Sciatica

MRI of the spine if patient demonstrates

• “Red flags”
• Neurologic deficits or progressive neurologic signs and symptoms
• Pain persisting more than 6 wk
Management of Acute and Chronic Back Pain

General considerations

• Primary therapy related to etiology
• Patient expectations
• Patient education related to pain treatment
• Pain treatment cost-effectiveness
• Prevention of back pain exacerbations
• Prevention of unnecessary surgery and suffering (failed-back-surgery syndrome)
Management of Back Pain

- **Pharmacologic agents**
  - Opioid analgesics
  - Anti-inflammatories
  - Adjuvants and nonopioid analgesics

- **Nonpharmacologic therapies**
  - Rehabilitative
  - Interventional
Management of Back Pain

• Comprehensive assessment of patients is essential to form the appropriate treatment plan.

• In the majority of cases, pharmacologic treatment is the main approach.
Management of Acute Back Pain

• Overall, 90% of patients will recover within 2 months without need for any invasive procedure.

• The management of acute back pain without sciatica or neurologic deficits calls for a conservative approach with analgesics and no bed rest.
Management of Acute Back Pain

- With sciatica and no neurologic deficits
  - Conservative management with analgesics
  - Bed rest for 2–3 d
  - Activities as tolerated
  - Neurologic consultation as needed

- With sciatica and positive neurologic deficit
  - Individualized length of rest
  - Analgesics
  - MRI study plus urgent neurologic or emergent neurosurgical evaluation, according to progression of deficits and symptoms
Nonsteroidal Anti-inflammatory Drugs (NSAIDs)

- Inhibition of cyclooxygenase activity
- COX-1 and COX-2 drugs
- Toxicity: Gastrointestinal, renal, platelet aggregation
- Multiple drugs
- “Ceiling” dose effect
- Peripheral and central analgesic action
Acetaminophen

- Minimal anti-inflammatory action
- Central analgesia
- No GI or platelet-aggregation toxicity
- Serious dose-dependent hepatotoxicity
- “Ceiling” dose effect
Disabling Back Pain: Opioid Therapy

- Consider opioid responsiveness
- Dosing: Short-acting plus long-acting or controlled-release opioid preparations
- In-hospital dose titration for severe cases: IV PCA technique
- Consider opioid rotation
- Combine with physical therapy and other analgesics
- Consider cost
Chronic Back Pain: Opioid Therapy

Combination products
- Codeine
- Oxycodone
- Hydrocodone
- Dihydrocodeine

Single-entity agents
- Fentanyl
- Levorphanol
- Methadone
- Morphine
- Oxycodone
- Hydromorphone
- Tramadol
Acute and Chronic Back Pain: Opioid Therapy

**Short-acting opioids**
- Combination products
- Hydromorphone
- Morphine
- Oxycodone
- Oral transmucosal fentanyl
- Tramadol

**Long-acting opioids**
- Morphine CR
- Oxycodone CR
- Fentanyl CR
- Methadone
- Levorphanol
Chronic Back Pain: Opioid Therapy

• Discuss
  – Addiction
  – Physical dependence
  – Tolerance
  – Side effects
Nonopioid Adjuvant Analgesics

- **Antidepressants**
  - TCAs (nortriptyline, amitriptyline, desipramine)
  - SSRIs (paroxetine, sertraline, fluoxetine)
  - Venlafaxine

- **Alpha 2-adrenergic agonists**
  - Tizanidine, clonidine

TCA = tricyclic antidepressant; SSRI = selective serotonin reuptake inhibitor
Nonopioid Adjuvant Analgesics

Antiepileptics and Antiarrhythmics

- Gabapentin
- Carbamazepine
- Clonazepam
- Valproate
- Lamotrigine

- Tiagabine
- Topiramate
- Oxcarbazepine
- Zonisamide
- Mexiletine
Rehabilitative Therapies for Back Pain

- Exercises for strength and flexibility
- Weight-control management
- Behavioral relaxation techniques
- Alternative medicine and physiatric modalities
Interventional Pain Medicine and Spinal Surgeries

- Intrathecal infusion devices
- Spinal cord stimulator
- Percutaneous radiofrequency denervation
- Neurolytic procedures
- Diskectomy
- Decompression (laminectomy, foraminotomy)
- Spinal stabilization
- Vertebroplasty
Chronic Back Pain: Conclusions

- High prevalence and major socioeconomic cost
- Numerous therapies, which should be individualized and based on detailed assessment
Back Pain and Sciatica: Conclusions

- Patients experiencing back pain and sciatica should receive a comprehensive assessment and prompt, effective treatments.
- Contemporary standard care of back pain and sciatica may include the use of opioid analgesics.
- Invasive therapeutic options must be limited to a few carefully selected patients.
Questions?