Updates In Lumbar Injury Treatments

Chairperson: Tony Tannoury, MD

Tuesday, March 28th

8:05-9:10am

Spinal Injuries Amenable to Conservative Treatment

Eduard Vaynberg MD

Director of Pain management
Boston Medical Center

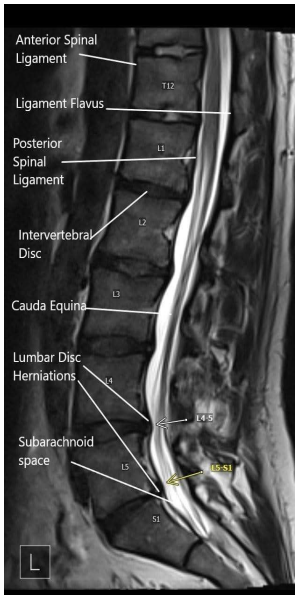
Assistant Professor Boston
University School of Medicine

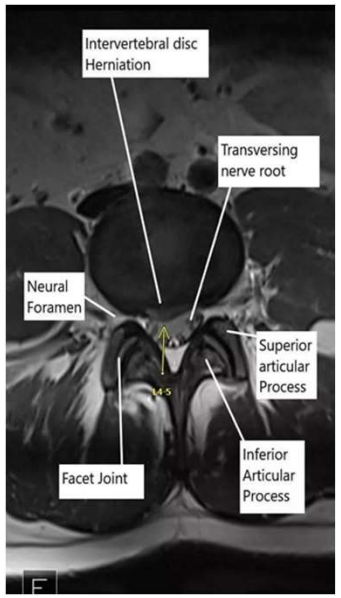
Surgical Management

- Unstable injuries.
- Progressive neurological deterioration.
- For early mobilization in neurologically compromised patient to release compressed neurological structure.
- In patients with a high incidence of late complications, eg, kyphosis of 30° or loss of vertebral height of more than 50%.

Conservative Management Spinal Injuries

- Cervical/thoracic/lumbar radiculopathies
- Cervical/thoracic/lumbar facet injuries





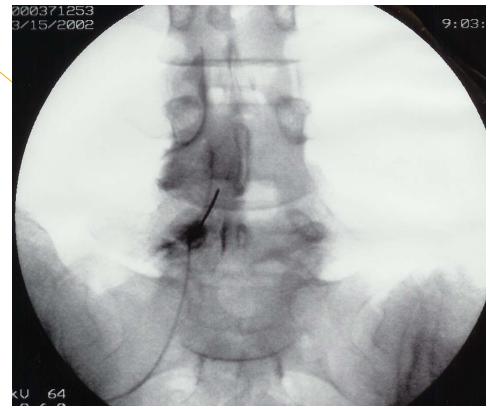
Management Options: Noninvasive

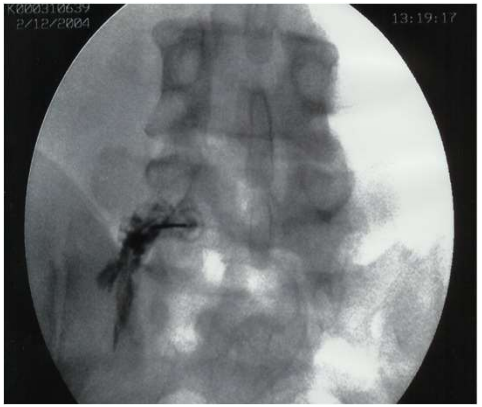
Always tried first:

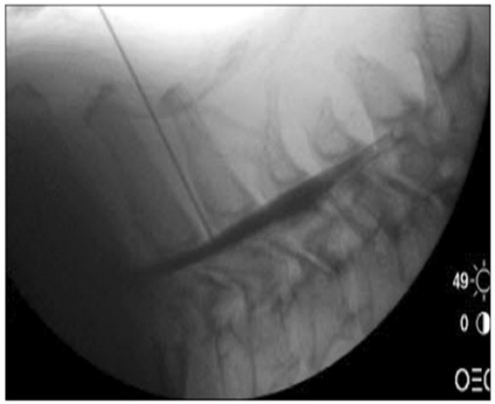
- Pain and anti-inflammatory medications: acetaminophen (Tylenol) nonsteroidal anti-inflammatory medications (ibuprofen, naproxen, meloxicam, etodolac, etc.), steroids, neuropathic pain medications (gabapentin, pregabalin, duloxetine, tricyclics)
- Physical Therapy
- Stretches, heat, ice
- Bed rest: contraindicated

Interventional Pain Management Options

- For radiculopathy: epidural steroid injections: delivering steroids to spinal nerves irritated by the inflammatory mediators from the ruptured intervertebral discs or by skeletal pathology (bone spurs, spinal stenosis) to decrease inflammatory response and allow tissues to heal with less pain

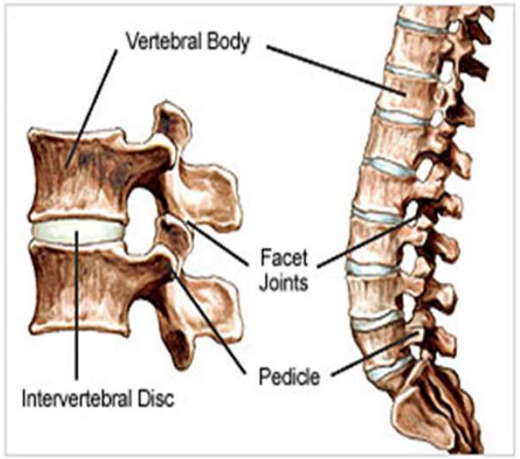


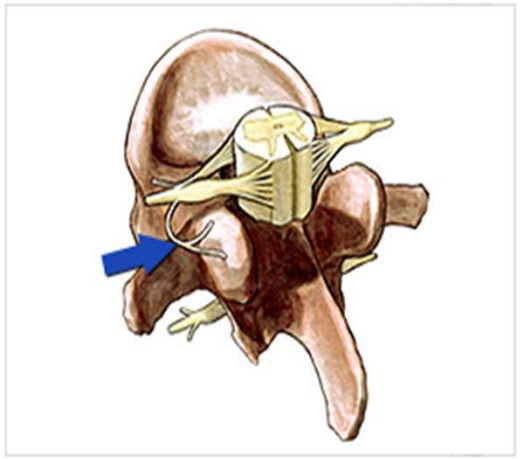


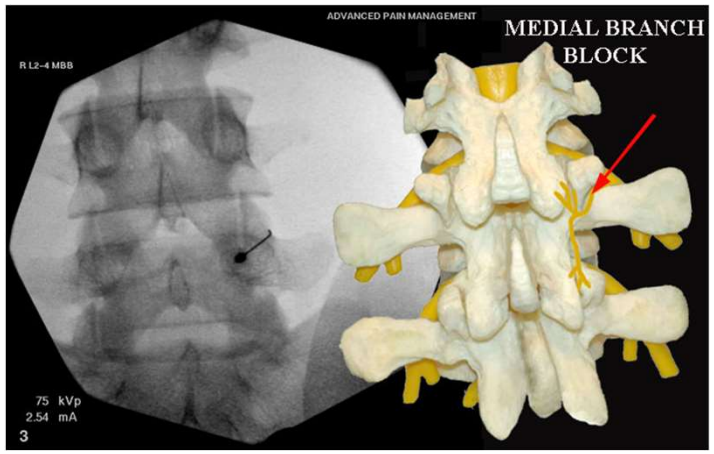


Interventional Pain Management Options

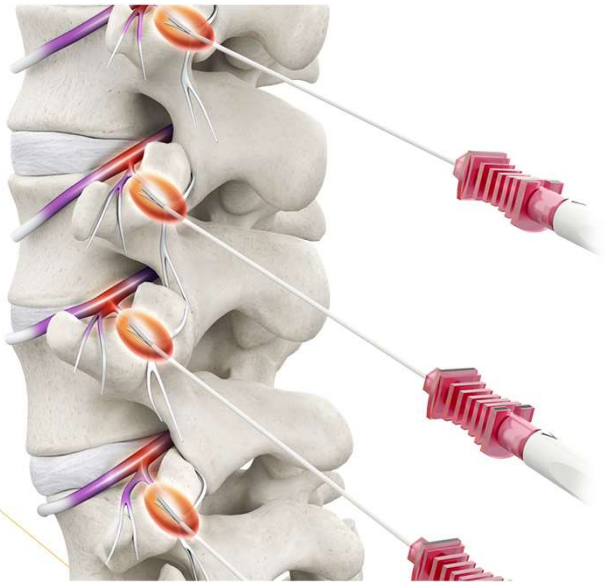
- Lumbar and cervical facet injuries: medial branch blocks and RFA
- Therapeutic and diagnostic: if successful even for short term (duration of a local anesthetic action) ablation with heat generated by electric current (Radio Frequency Ablation=RFA)

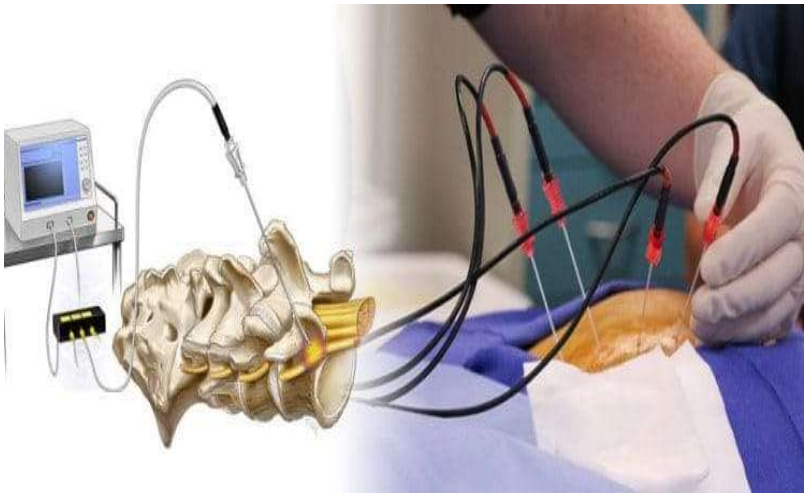






Radiofrequency Ablation





Chadi Tannoury, MD

Medical Director, Orthopedic Ambulatory Clinic

Associate Professor – Orthopedic Surgery

Director, Spine Research

Boston University Medical Center

Lumbar Session

The Spectrum of Injuries

Factors Affecting RTW

20 min

2023
Work Related Injuries Workshop

Disclosure

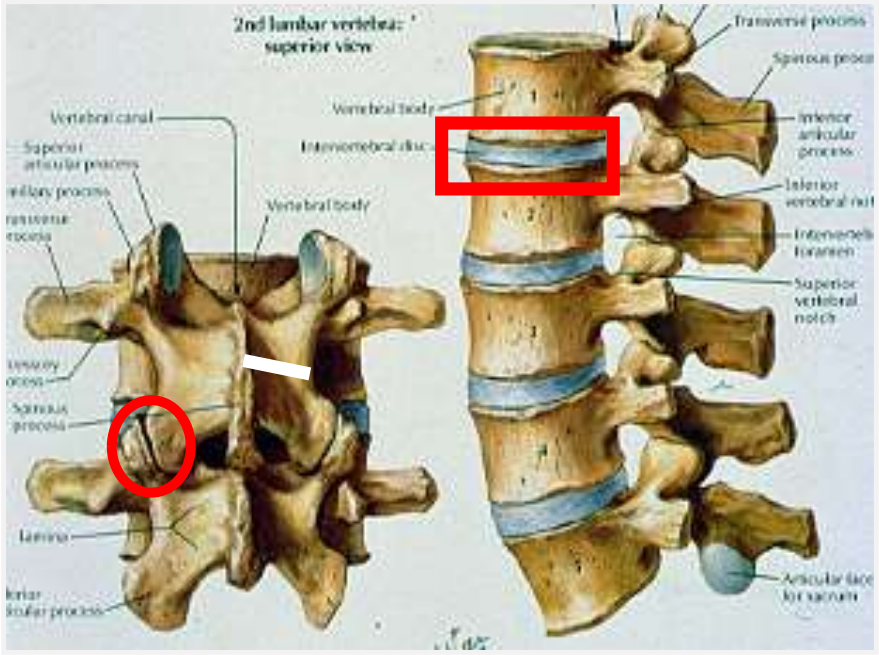
- I have something to Disclose (Website)

2023
Work Related Injuries Workshop

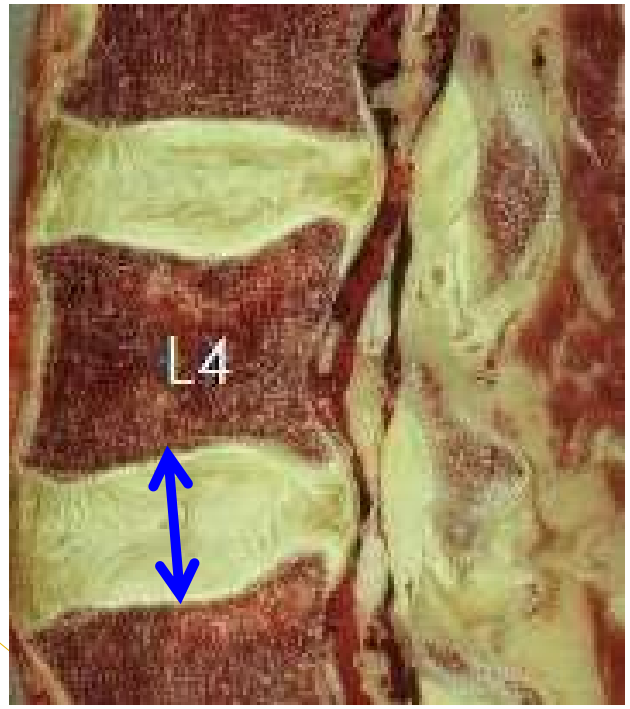
Lumbar Injuries & Pain Generators

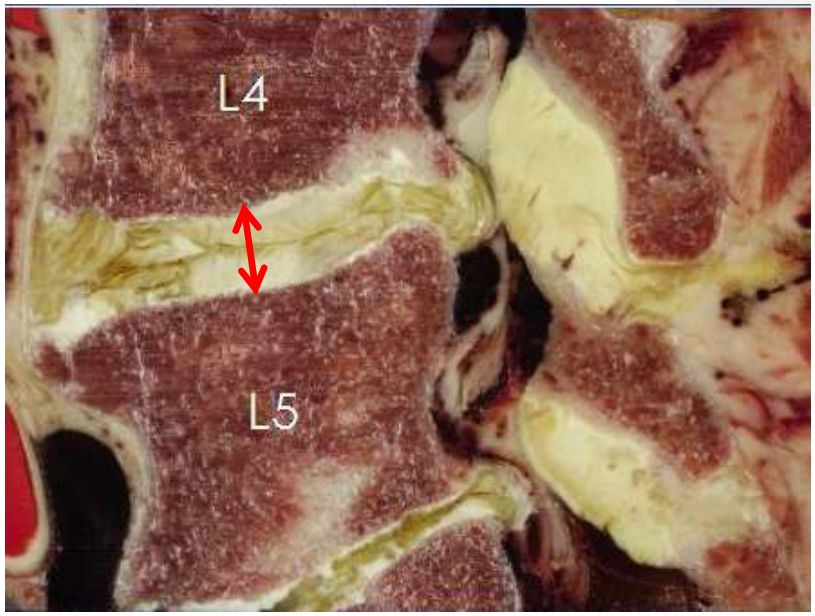
Lumbar Bony Anatomy

- Body
- Arch/lamina
- Spinous Process
- Facets
  - sagittal orientation
  - limit rotation
  - Inferior facet medial
  - Superior facet lateral
- Pars Interarticularis



Healthy vs. Degenerated



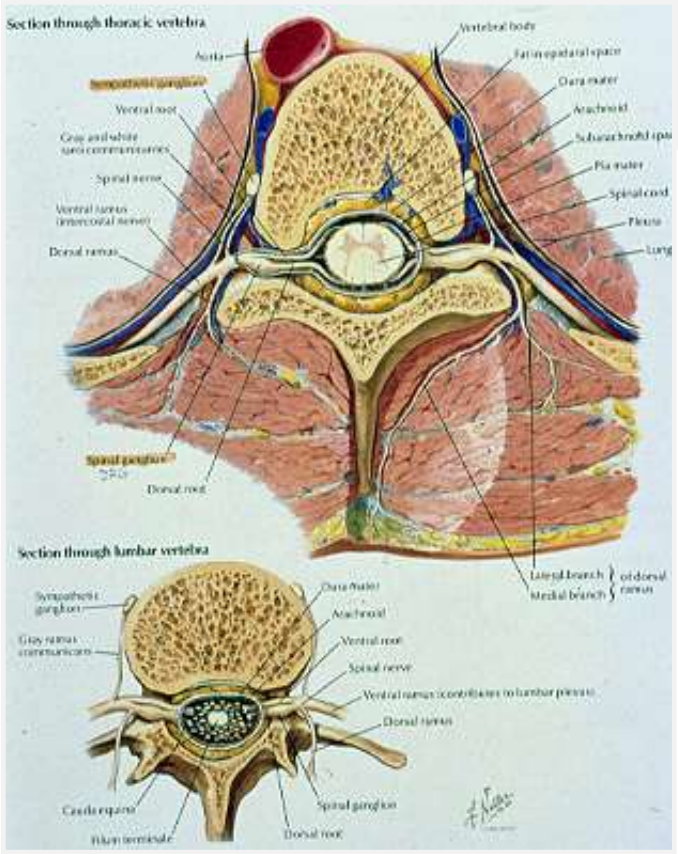


Overview

- What Causes Back & Leg Pain:
  - Nerve pinch
  - Disk: Herniation – Degeneration
  - Facet problem?
  - Instability: Spondylolysthesis
  - Gobal: Stenosis

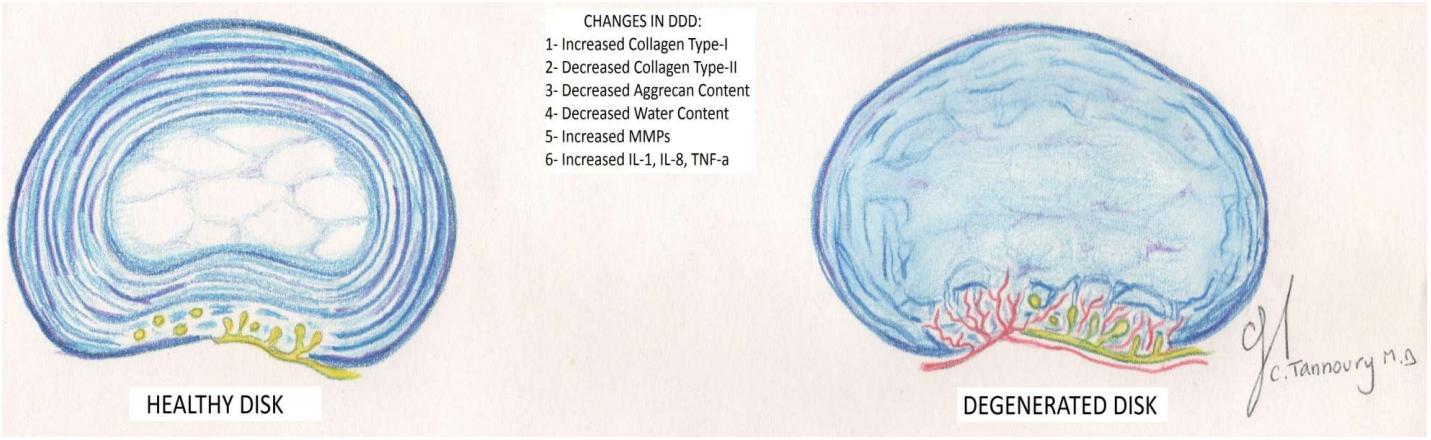
Spinal Nerves

- Ganglion
  - In foramen
  - Cell bodies of primary sensory neuron
- Nerve Root
  - Motor- ventral
  - Sensory- dorsal



Pathophysiology

- HNP
- DDD

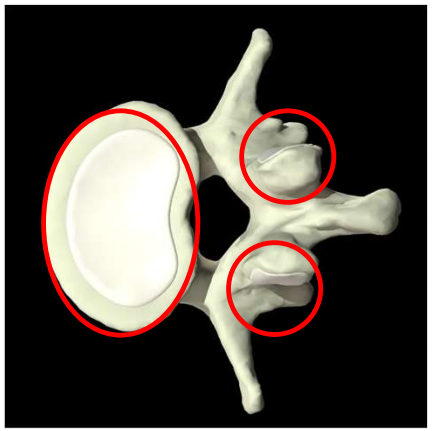


Biomechanical Considerations

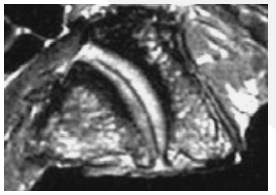
Disc

- Non-Synovial Joint
- Largest Avasular Structure in the Human Body
- 50% Torsional Load
- 80% Axial Load.
- Low Stiffness Nucleus (>0.01 MPa) Facilitate Minimal Resistance to Flex./Ext.

White & Panjabi 1978

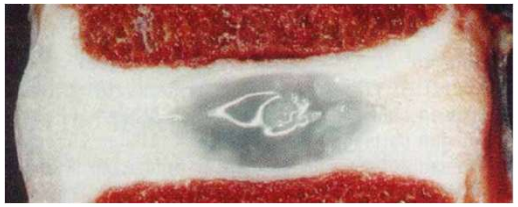


Facets

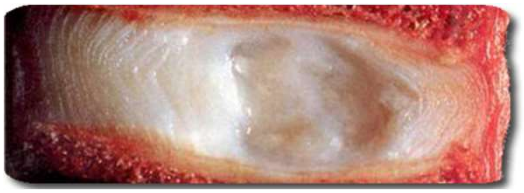


- Synovial Joint
- 50% Torsional Load
- 20% Axial Load.
- Shear resistance

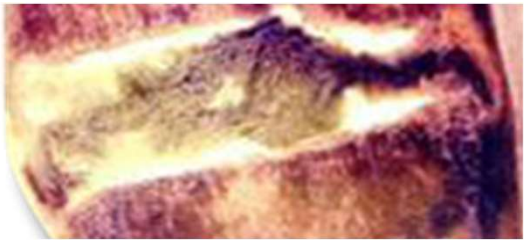
Healthy



Slightly Degenerated

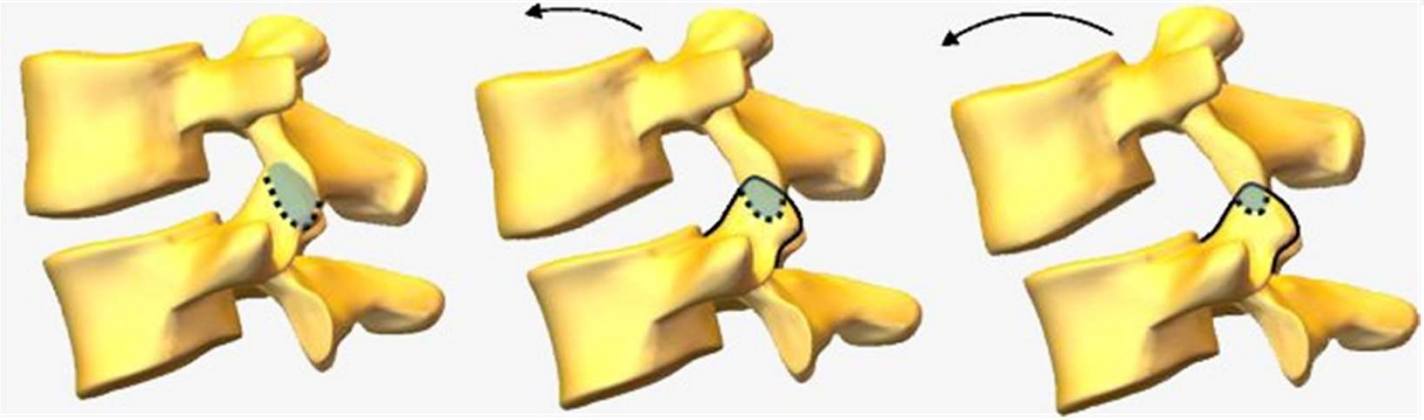


Strongly Degenerated



Nachemson 1964

Cascade: Disc → Facet → Slip



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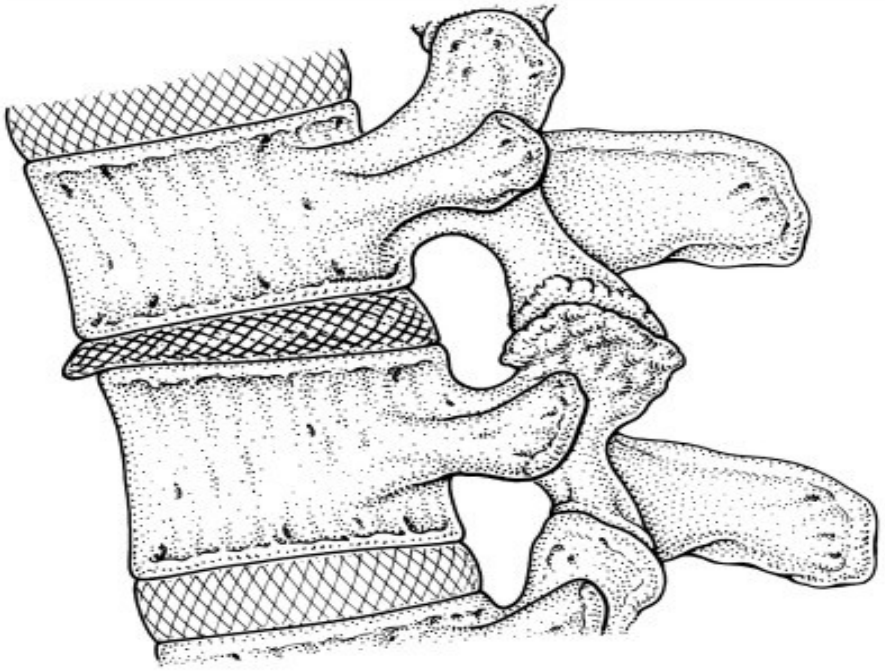
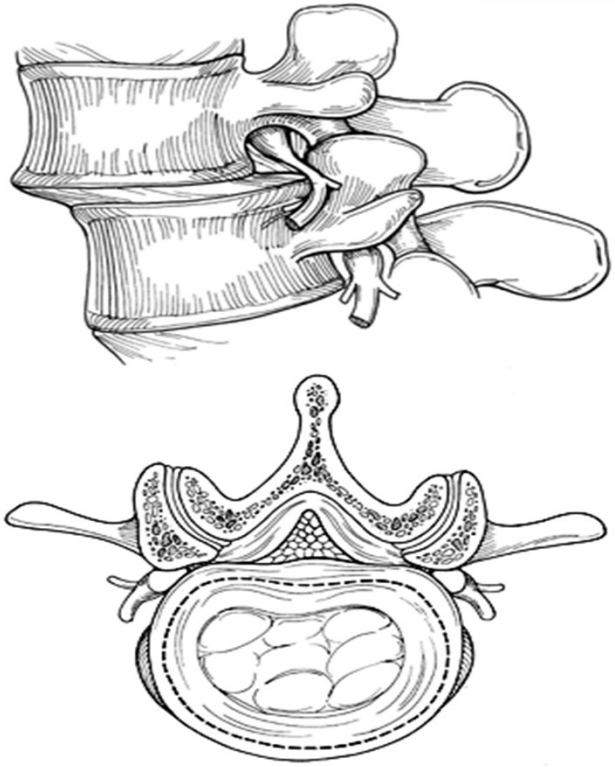
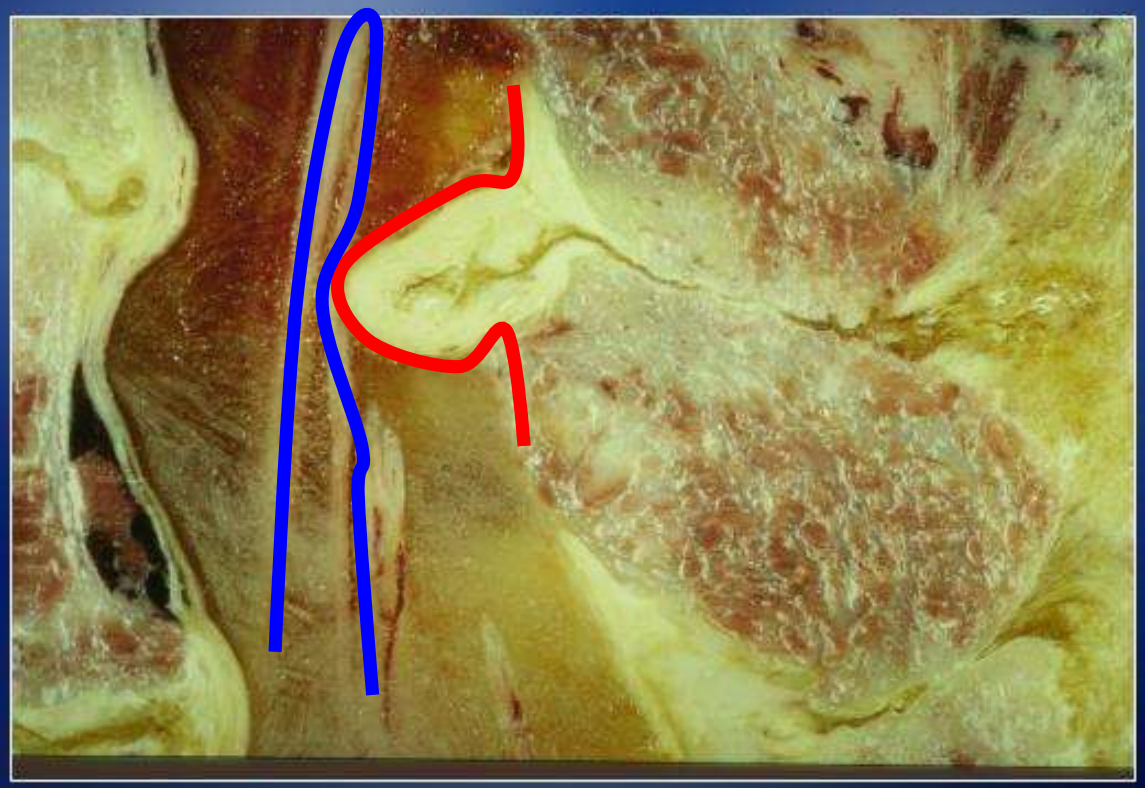
Work Related Injuries Workshop





Complete disc resorption causing kissing spines



W. Rauschning

Sclerotic L4-5 spondylophyte, kissing laminae neoarthtosis and infolding ligamentum flavum

W. Rauschning

Low Back Pain

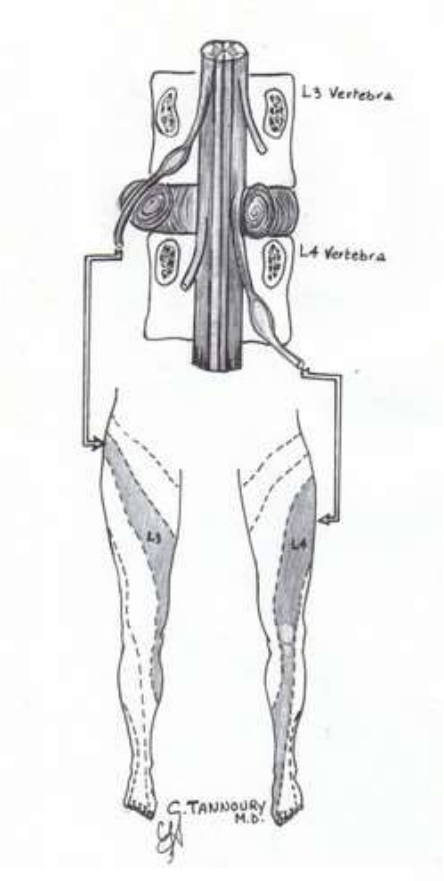
Incidence

- Lifetime 80%
- Chronic 10-20%

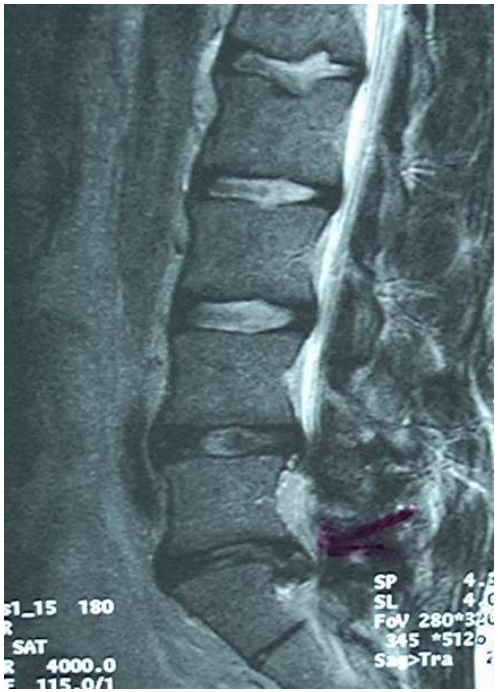
Herniated Lumbar Disc Disease

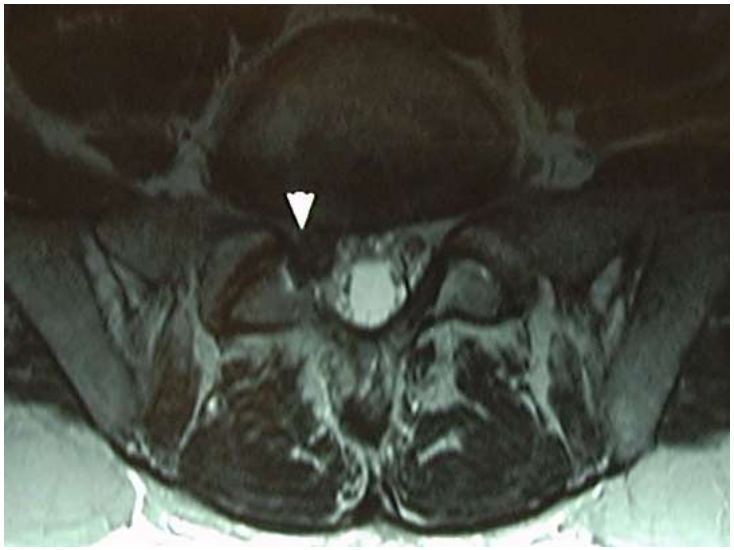
Lumbar HNP
(Bulge, protrusion, extrusion, slip, etc..)

- Unilateral Sciatica
- Leg pain>> Back Pain
- Dermatomal Distribution
- Neuro-tension signs



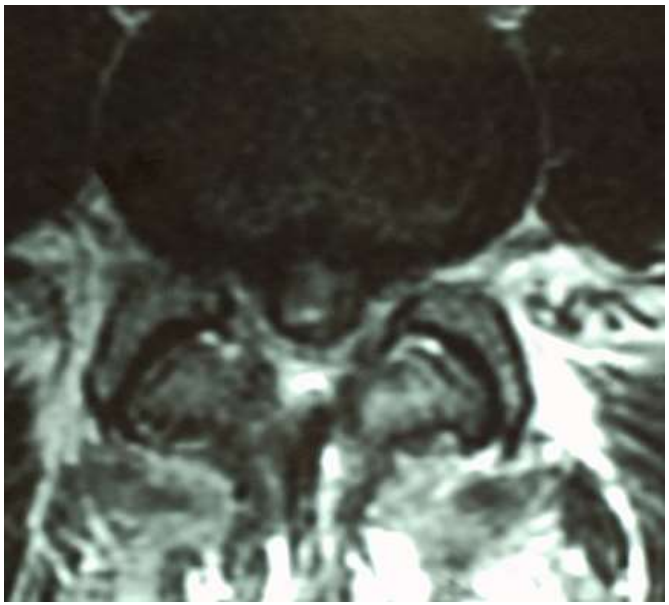
Posterolateral disc





Central Disc

- Often presents with back pain
- May have symptoms of neurogenic claudication



SCIATICA - 73% IMPROVE IN FIRST 3 MONTHS

- 38 % IN FIRST MONTH

HAKELIUS, 1970

Prognostic factors RTW @2yrs

- POSITIVE factors: (young – Healthy – Prev asymptomatic)
  - Younger age
  - Better general health
  - Lower baseline sciatica bothersomeness
  - Less fear-avoidance-work
- NEGATIVE factors: (Older – preexisting pain)
  - Sciatica duration > 3 months
  - Greater sciatica bothersomeness
  - Higher fear-avoidance-work

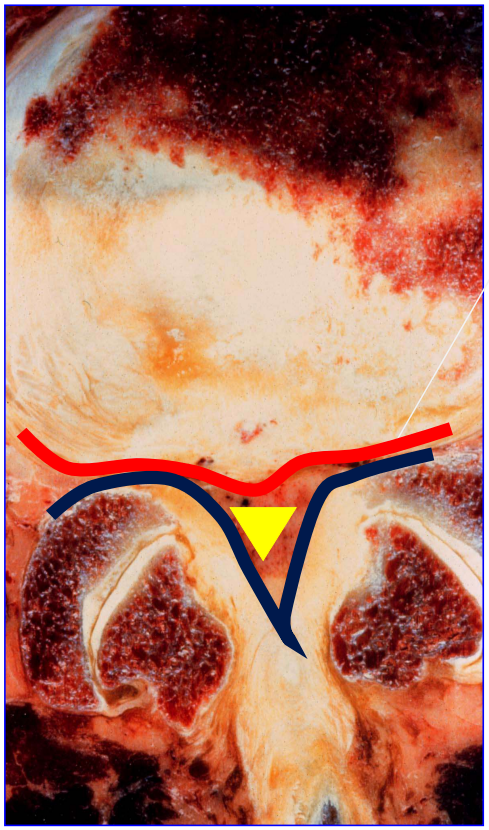
Grovle et al, Spine J 2013

Lumbar Stenosis

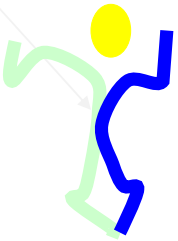
Spinal Stenosis = Arthritis

- Older patients
- Neurogenic Claudication 2/3
- Radicular pain 1/3
- Worse with extension
- High incidence of vascular comorbidities

Pathoanatomy

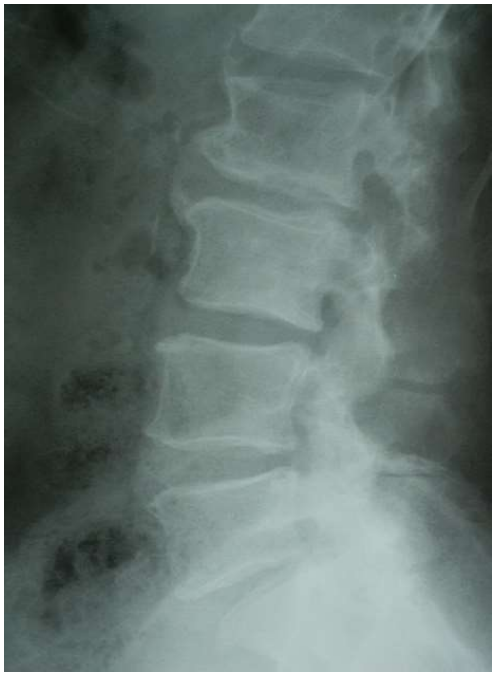


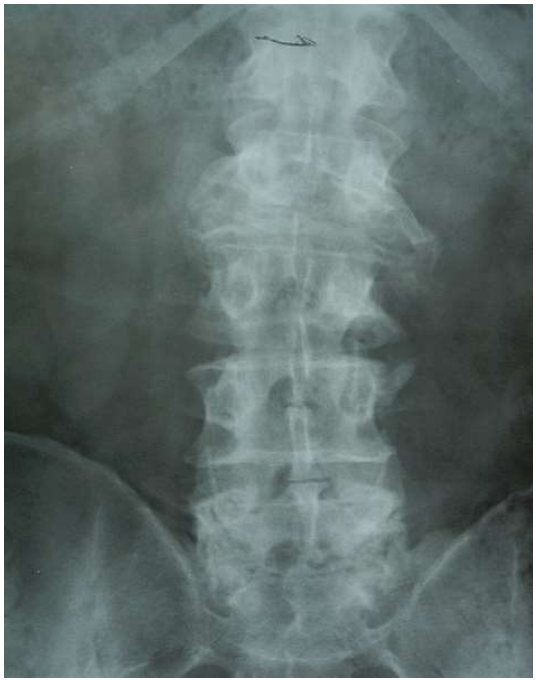
Lateral recess

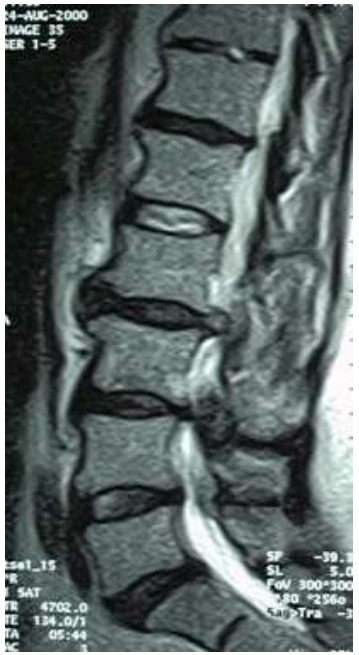


Shopping Cart Sign

Radiographs/MRI







Conservative Therapy

- Flexion based exercises
- Epidural steroids
- Activity modification

Psycho-social factors

- **Depression**
  - a/w poorer outcome of LSS surgery
  - Preop Depression // postop LSS sx severity & disability
  - Identify patients w Depression and Rx them!

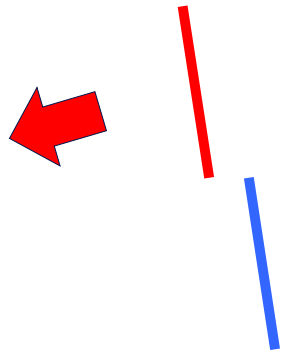
Sinikallio et al, Eur Spine J 2007

McKillop et al, Spine J 2013

Lumbar Spondylolisthesis

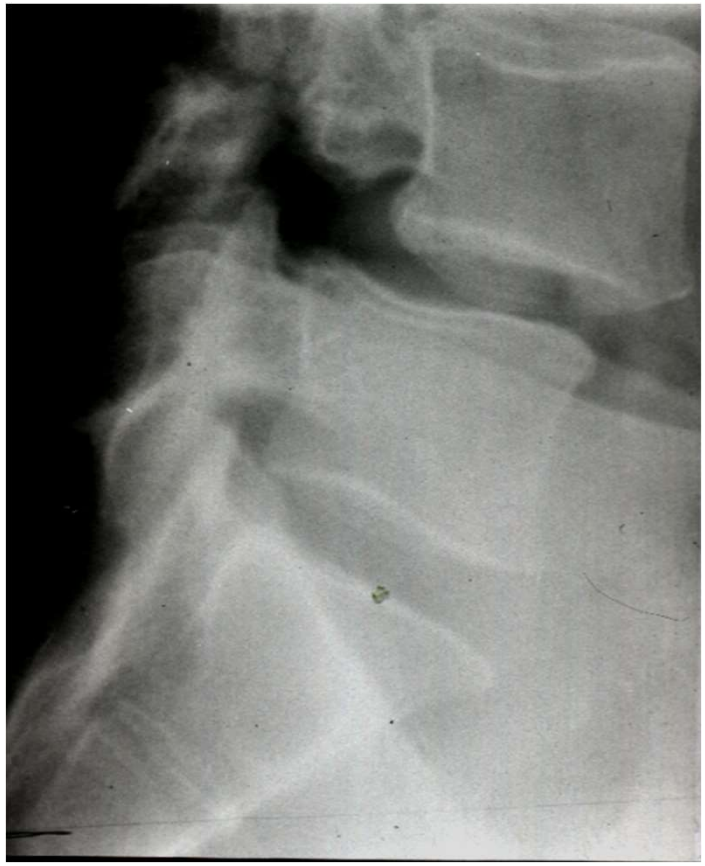
Degen. Spondylolisthesis

Forward slippage of one vertebral body on another



Spondylolytic/isthmic Spondylolisthesis

- Discontinuity between posterior and anterior spinal elements
- Etiology:
  - Stress fracture
  - congenital
  - Traumatic
  - iatrogenic
  - unknown



CLINICAL FINDINGS

- Back pain
- Neurogenic Claudication
- Difficulty with ambulation
- Difficulty with extension
  - Walking down hill
  - Shopping cart sign
  - Lying prone

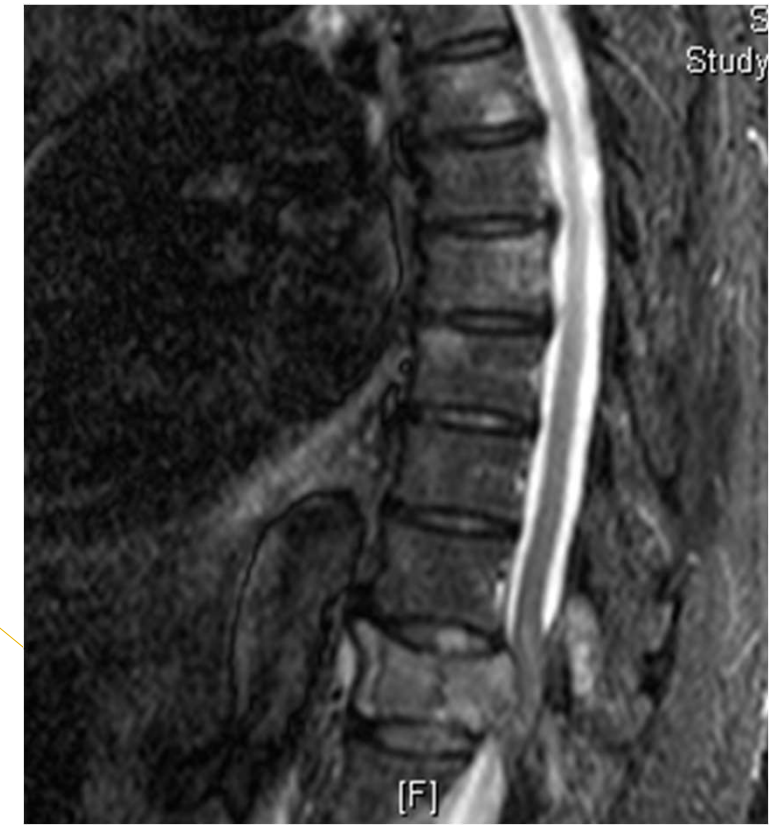
2023

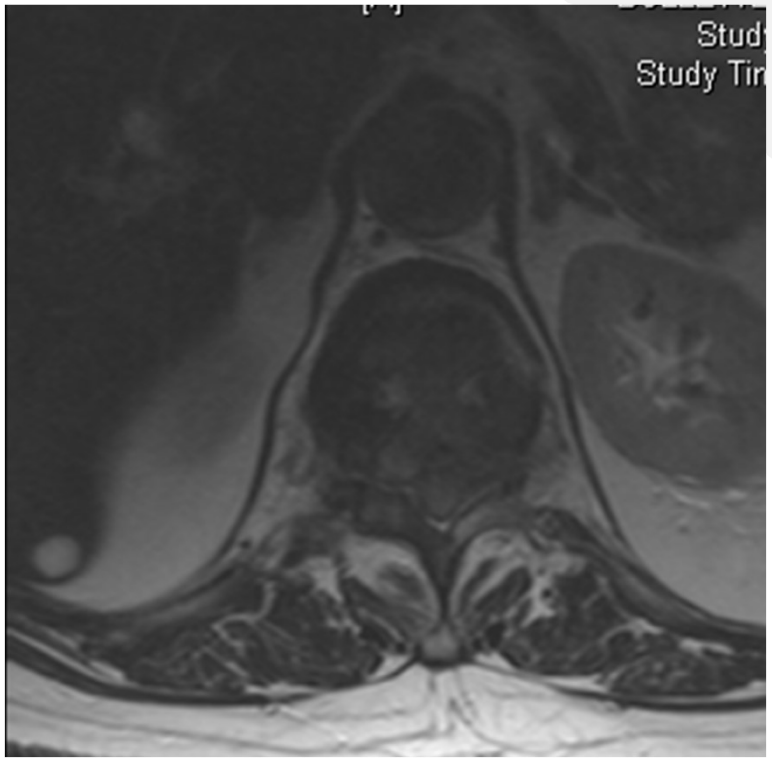
Work Related Injuries Workshop

Red flags for possible serious spinal pathology

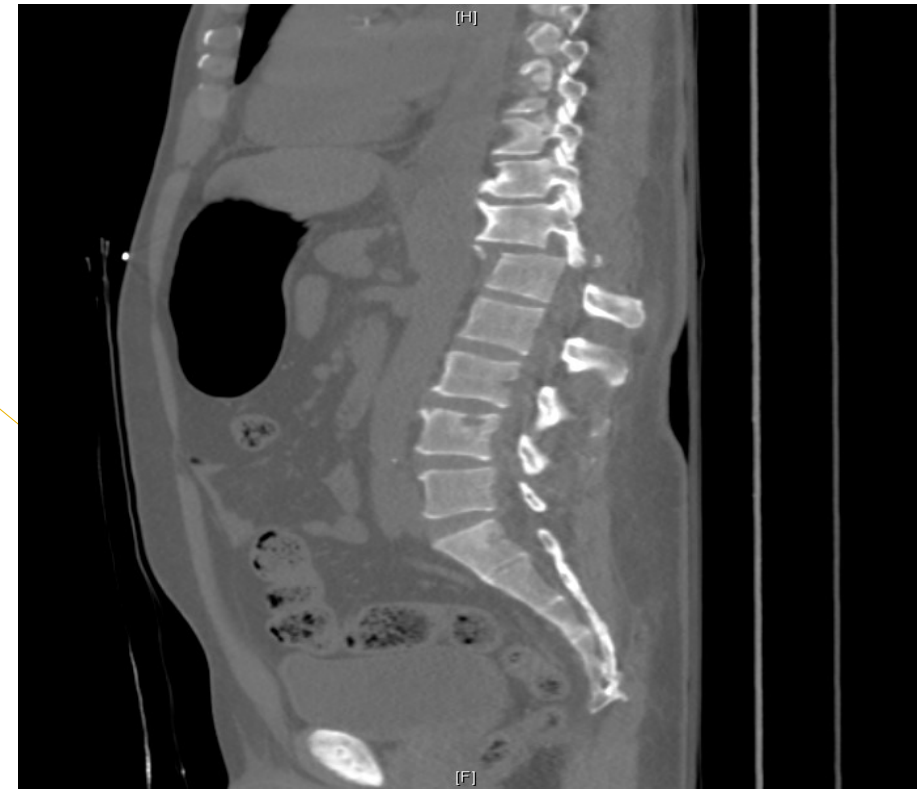
- Too Young – Too Old
- Past hx of carcinoma – Chronic Steroid Use
- Unwell, weight loss
- Widespread neurology
- Structural deformity
- Abnormal blood parameters

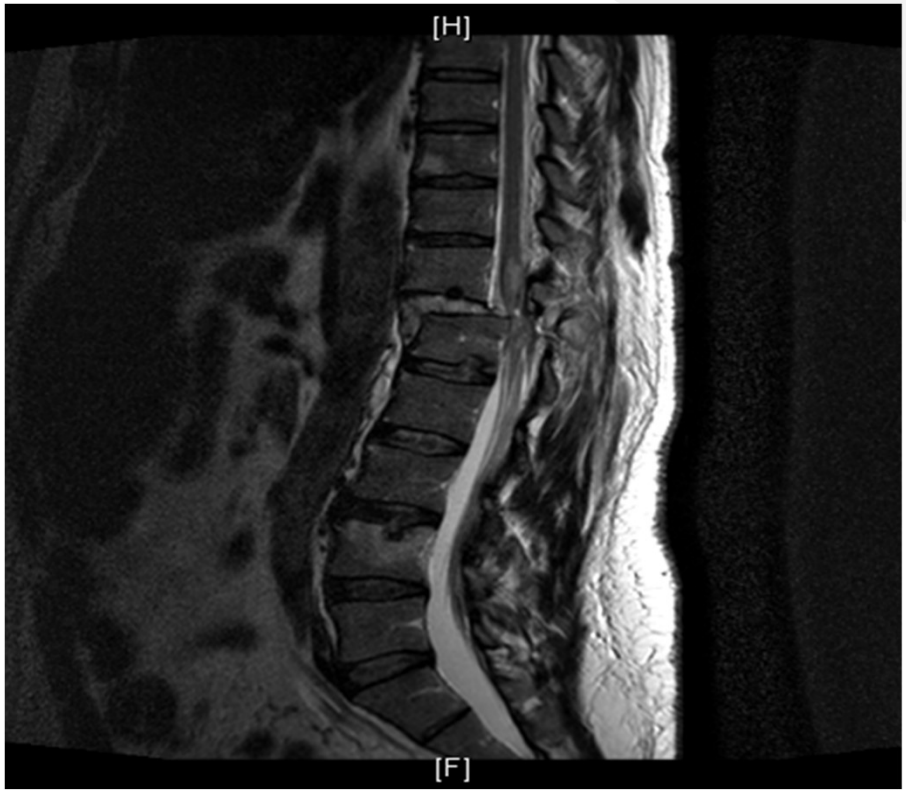
80 y F- Acute Back Pain w LE weak





45 y M – s/p MVA – No S/M LE





OCCUPATIONAL BACK PAIN

- ONE OF THE MOST COMMON LABOUR FORCE COMPLAINTS

- AFFECTS NEGATIVELY EMPLOYER AND EMPLOYEE

Length of disability and cost of workers' compensation low back pain

- Back pain claims= 10% of all claims
- 86% cost
- Of which 7% chronic: >1 year……..75% total cost

Hashemi et al, Occup Environ Med 1997

RISK FACTORS

- Repetetive physical strains: loading, lifting, twisting
- Job dissatisfaction:
  - No recreation
  - Low pay jobs
  - Employer’s dismissal
- Depression
- Women > men

JOB NATURE
(Physical Demands)

- MATERIAL HANDLING
- BENDING, TWISTING AND REACHING
- STANDING
- SITTING WITH NO BACK REST
- VIBRATION

- Currently, it is **not possible to predict** accurately which workers with recent injuries will go on to **develop chronic disability**.

The probability of recovery and return to work from work disability as a function of time.

- If no return to work by 3 months: 50% risk of no return by 15 months

Crook J, *Qual Life Res* 1994, **3 Suppl 1:**S97-109

Predictors of 6-month disability

- Age (Older)
- Education (Lack of)
- Baseline pain (PreExist)
- Baseline disability (PreExist)
- Low recovery expectations (Neg Outlk)
- Fears that work may increase pain

Turner et al, spine 2006

Ideally!

- Prevent injuries
- Immediate recognition and proper referral
- Aggressive management
- Offer light duty options
- Work hardening
- Very active treating team communication
- Surgery if needed
- Minimally invasive surgery!!!!

Thank You!!

Injuries that Are Amenable to Conservative Treatment

Eduard Vaynberg, MD

When Surgery Is the Best Treatment

Tony Tannoury, MD

Patient Related Factors & Outcomes

Chadi Tannoury, MD, FAOA, FAAOS

Ten Cases In Ten Minutes