Lumbar Discogenic Pain Syndrome (DPS)

Douglas M. Gillard, BS, DC
Spine Research Coordinator
Discogenic Pain Syndrome???
What It’s Not: The Usual Suspects

- Spondylolisthesis
- Scoliosis
- Spinal Stenosis
- Facet Syndrome
- Disc herniation
- Recurrent disc herniation
- Motion segment instability
Discogenic Pain Syndrome

- Defined: the disc and/or vertebral endplate(s) of the motion segment becomes a source of chronic back pain.

- Three causes of Discogenic Pain Syndrome
  - Internal disc disruption (IDD)
  - Isolated disc resorption (IDR)
  - Disc herniation with low back pain greater than lower extremity pain
Why is This Important?

1. High prevalence amongst the undiagnosed
   *Calculated at 40% [p<0.05](Schwarzer – 1995)

2. Healthcare professional unawareness

3. Most refractory to conservative and operative care

4. Severely disabling
Overview: where are we going?

- Basic Spinal Anatomy
- Motion Segment Anatomy & Physiology
- Degenerative Disc Disease (DDD)
- Discogenic Pain Syndrome
  - IDD, IDR, NRDH
  - Research
Basic Spinal Anatomy: Lumbar Spine
Osteology
Spine: the “Tree” of the Body: (Limbs & Roots)

- Indirect attachment point for **Limbs**.
- Allows for movement of the head and **Trunk**.
- Spinal Nerve **Roots** enter / **Leave** the CNS & ANS.
Spine

- Make of 33 vertebrae (24 true motion segments)
  - 7 Cervical
  - 12 Thoracic
  - **5 Lumbar**
  - 1 Sacrum (5 fused vertebrae)
  - 1 Coccyx (4 fused vertebrae)
  - 2 Coxal bones
    - Form SI joints
    - Not part of the spine
Parts of a vertebrae: Job of posterior arch

Vertebral body
Pedicle
Lamina
(Posterior arch)
Inferior articular process
Pars Interarticularis
Superior articular process
Transverse process
Spinous process
Jumping Ahead in the Presentation
Discogenic Pain Syndrome

- Internal Disc Disruption
- Non-Radiculopathic Disc Herniation
- Isolated Disc Reabsorption
DPS Generalities

• **Almost always a consequence of DDD.**

• **Usually a progression:**
  - Disc loses water content (**DDD**).
  - Full thickness annular tear develops (**IDD**).
    • May progress to *non-radiculopathic disc herniations.*
  - Severe disc degeneration (discopathy) and endplate degeneration (rat-bite & Modic changes) follows (**IDR**).

• **Very difficult to treat and very disabling.**
Internal Disc Disruption (IDD)

• Results from annular tears
  • From nucleus to outer annulus
  • Originate in outer annulus
Different Flavors of Tears

- **Radial annular tear** (a.k.a. full thickness annular tear)
  - Runs from nucleus toward the outer annulus
    - Grading system

- **Concentric annular tear**
  - Occurs in the outer one third
  - The tear is between lamellae
  - Maybe extremely painful
  - Traumatically induced

- **Rim lesion**
  - Occur in the other one third
  - Tear is through lamellae
  - Will develop into a full thickness annular tear
  - Traumatically induced
  - Often associated with a traction spur
Annular Tears
Jumping Ahead
Endplate Sclerosis
Grade III Annular Tear (IDD)
What causes the pain?

• **Biochemical irritation** (inflammation)
  – Cytokines
  – Autoimmune

• **Biomechanical irritation** (compression)
  • Weight bearing shift

• Chronic Pain: nerve in growth
Mechanical Irritation

Axial Load Shift
Annular Tear Healing

- HEALING: May w/ scar / granulation tissue but always be a source of chronic pain
  - Nerve ingrowth
  - Easy to re-injury the tear
Nociceptive Ingrowth
Making the Diagnosis

- **Gold standard:** *Provocative CT Discography*
  - Controversial secondary to significant false positive rate.
    - Sensitized people.
  - Nothing better has come along.
  - CAN DAMAGE THE DISC!
    - Carragee Study
  - **Concordant pain at target disc w/ control.**
    - Anesthetizing will create a non-painful disc.

- **Diagnostic Injections.**
  - Intractable low back pain aggravated by sitting and relieved by lying supine.
  - Often a negative neurological evaluation and negative MRI.
  - Facet blocks and epidural steroid injections are negative.

- **MRI findings.**
  - Visible annular tear on T2-weight.
  - HIZ sign.
Treatment:

- Very difficult to treat!
- Conservative care first
  - Strengthen the core
  - Get heart rate up
  - **Diurnal stimulation**
    - Inversion table (stim diurnal change)
    - Intermittent traction devices (Vax D, DRS, DRX-9000, Spine-Med)
- Pre-fusion “Experimental” treatments
  - IDET, SED & and similar SED-like treatment
- Interbody fusion
  - Make damn sure the pain is not coming from the facets or SI joints!
End of Sample Presentation