DISCOGENIC PAIN
OUTLINE

• Anatomy
• Approach to LBP
• Discogenic LBP
  – Herniated Nucleus Pulposus
  – Annular Tear
• Treatment
  – Non-Surgical
  – Surgical
• Facet Joints: bear 20% of weight
• Discs bear 80% of weight
• Neural Foramen

• Anterior Longitudinal Lig.
• Posterior Longitudinal Lig.
Neuro Arch

Vertebral body
Vertebral foramen
Pedicle
Transverse process
Superior articular process
Mamillary process
Lamina
Spinous process
Accessory process

2nd lumbar vertebra: superior view

Lumbar vertebrae, assembled: left lateral view
Proteoglycans
APPROACH

PAIN GENERATORS
POSTERIOR TO ANTERIOR
Lumbar vertebrae, assembled:
left lateral view

2nd lumbar vertebra:
superior view

- Vertebral body
- Vertebral foramen
- Pedicle
- Transverse process
- Superior articular process
- Mamillary process
- Lamina
- Spinous process
- Accessory process
DISCOGENIC LBP

Non-Radicular (Without Leg Pain)
Radicular (With Leg Pain)
Without Leg Pain (Axial Pain)

Annular Tear
Degenerative Disc Disease
With Leg Pain (Radicular)

Disc Bulge, Protrusion, Extrusion, Sesquestration

Neuro-Compressive Lesions
TREATMENT
• NATURAL HISTORY of LUMBAR DISC DISEASE

• OUTCOME STUDIES OF NON-SURGICAL TREATMENTS vs SURGICAL TREATMENTS

• CLINICAL VIGNETTES
NON SURGEONS vs SURGEONS

WHEN DO WE NOT vs 
WHEN DO WE DO OPERATE?
“TIMING HAS AN AWFUL LOT TO DO WITH THE OUTCOME OF A RAIN DANCE”
LUMBAR DISC DISEASE

- 60-80% Lifetime incidence of LBP
- Natural History has a highly favorable outcomes
- Innovative Technological Treatments
- Timing of Rain Dance
NORMAL POPULATION

• 35% Healthy Male Volunteers have significant DDD Paajanen et al

• 90% people age >50 have DDD Miller et al

• Analogy between LBP and Gallstones
DISABILITY

- 95% Patients return to work within 3 months
- Otherwise → Poor prognostic factor
- 20% return to work after 1 year of disability
- 2% return to work after 2 years of disability
NATURAL HISTORY

• 62% Disc Herniation Resorp Over Time
• The Larger $\rightarrow$ The More Resorption Matsubara et al
• Large Compressive Discs are usually symptomatic and Respond well to surgery Saals et al
• Large Discs also have a high rate of clinical improvement with non-operative treatment
RISK FACTORS

• Driving of motor vehicles, Sedentary occupation, Vibration, Smoking, Previous full-term pregnancy, Physical inactivity, Increased body mass, and a Tall stature
• Physical fitness is not preventative
• Physical fitness will improve outcome
NON-SURGICAL

• In 208 patients, 70% Improvement in 4 weeks
• 60% return to work in 4 weeks Weber et al
• In 64 patients, 90% satisfactory outcome in one year Saals et al
• In 168 patients, 86% satisfactory outcome in one year Bush et al
SURGICAL

• Indications:
  – Cauda Equina
  – PROGRESSIVE Motor Loss
  – Intractable Pain
Surgical Outcome  Weber et al

• 126 Patients with Absolute Indications for Surgery
• Randomized to Surgery and Non Surgery
• 10 year follow-up
At 1 year:
  – 90% good outcome with Surgery as compared to 60% with Non-Surgery

At 4 years:
  – Surgery is slightly better (not statistical)

At 10 years:
  – Same for both groups
Patients who met the indications for surgery

Patients who were operated within 3 months had better outcome in 10 years
Response to Transforaminal Epidural Injections correlated with positive surgical outcomes as high as 95%  Stanley and Akkerveeke et al
“TIMING HAS AN AWFUL LOT TO DO WITH THE OUTCOME OF A RAIN DANCE”
Case #1

- 25 yo male with 2 days h/o LBP and right leg pain.
- Pain 8/10, 80% leg, 20% back
- Pain is debilitating and worsening

SHOULD YOU?
- Narcotics, Oral Steroids, PT, reassurance
- MRI
- Referral for Physiatry
- Referral for Surgery
MRI:

L5/S1 6 mm disc herniation
Case #1

**WHAT I WOULD DO?**

- Narcotics
- MRI
- Epidurals
- 90-95% chance of substantial pain reduction
- PT
- 5% chance of needing surgery
Case #2

• 26 yo male with 2 days h/o LBP and right leg pain, predominantly 80% leg pain.
• Pain is debilitating
• Right foot and toe weakness

YOU SHOULD DO?
– Narcotics, +/- Oral Steroids, Re-Evaluate
– Referrals for Physiatry
– Referrals for Surgery
Case #2

- MRI: 3mm Right Disc Protrusion
- Right foot drop is same

- Do Nothing
- Referral for Epidurals
- Referral for Surgery
Case #2

• Neurologically stable
• Young age
• Don’t know long term outcome for discectomy
• Excellent long term outcome for non surgery
What I would do:

- Narcotics, Cox 2
- Trial of epidurals
- Non-responsive → surgery within 3 months
- Aggressive intervention
- Control Pain
- Graduated and aggressive physical therapy
Case #3

• 28 yo healthy male
• Onset: two weeks ago
• No incontinence
• Right foot weakness 4/5
• Stable Neuro Exam
• MRI: 9 mm L5/S1 disc herniation
What would you do?

- Narcotics, +/- Oral Steroids, Re-Evaluate
- Referrals for Physiatry
- Referrals for Surgery
Case #3

- Disc protrusion larger than 8 mm has lower success rate with epidurals
- Disc sequestration however does well conservatively
- Surgery is the best option
- No long term outcome study
- Due to young age → art of medicine
Case #3

- Due to young age and acute nature
- Epidural
- Two additional Epidurals if continues to improve
- EMG/NCS 3 weeks after injury
- Aggressive exercise
- Surgery if course is protracted
- 70-80% will not need surgery
- Does the patient have the time for conservative care and willing to accept failure?
“TIMING HAS AN AWFUL LOT TO DO WITH THE OUTCOME OF A RAIN DANCE”
Case #4

- 60-70 yo with axial low back pain for 2 years and vague intermittent leg pain.
- Usual medical history
- No cancer history

- Needs full work up, Labs, MRI, EMG’s
- NSAIDS, 6 weeks of PT
Case #4

- EMG is normal
- MRI: Moderate DDD at L4/5 and L5/S1, small disc bulge/protrusion at L4/5 L5/S1,
- Facet hypertrophy with mild foraminal narrowing and mild spinal stenosis
Would You?

• Do nothing

• Refer patient to a Physiatrist
  – What could a physiatrist do?

• Refer patient to a Spine Surgeon
  – What would a spine surgeon do?
Case #4

• Physiatrist
  – Trigger point injections
  – Facet injections
  – Epidurals
  – Discograms
  – CT Myelograms

• Surgeon
  – Foraminotomy
  – Decompressive Laminectomy
  – Discectomy and Fusion
Case #5

- 75 yo with 6 months h/o low back pain and bilateral buttock and leg pain.
- Usual medical problems
- Used to walk ½ hour. Now only two blocks
- Neurogenic claudication
  - Better with rest
  - Worse with ambulation
  - Poor balance and clumsiness
- No incontinence
Case #5

• MRI: Spinal Stenosis at L4/5 and L5/S1. In conjunction with facet and ligamentum hypertrophy result in central and foraminal stenosis.

• EMG/NCS: 1. Normal, 2. Single level radiculopathy, or 3. Polyradiculopathy
What would you do?

• Surgery or NOT surgery?
• Modify lifestyle
• or Conservative Treatment
• or Epidural
• or Spinal Decompression
What I would do?

• If patient is healthy and active, we must do something!
• Epidurals are very effective
• Spinal decompression is very effective also. Has the best outcome of all spine surgeries.
Case #6

- 40 yo professional with 2 years of intermittent low back pain and leg pain
- Acute exacerbation
- MRI: small disc protrusion at L5/S1

- Non surgical approach
- EMG is normal
- Epidurals give partial relief
- Able to work but not satisfied with result
Case #6

• How far should we go with the work up?
• Discogram?
• Nucleoplasty, IDET, Surgery, Fusion????
Case #6

- Exercise for 6 months → pain improves
- 2 years later → full activity, minimal pain
- Able to run on treadmill for one hour at 8.5 minute/mile. Able to play two sets of tennis at 4.0 level
- Not able to lift more than 20 lbs without pain
Case #7

• 50 yo with 5 years h/o low back pain.
• No leg pain
• Has had all conservative measures
  – PT, Chiropractic, Accupunctures, Herbals
  – Pilates, Yoga
• Vicodin 6 tabs/day, Neurontin
• Norco
• Fentanyl patch
Case #7

• MRI:
  – Disc dessication and disc bulge at L4/5 L5/S1
  – No spinal or foraminal stenosis
  – Mild facet arthropathy
Physiatrist #1

- Trigger point injections
- Facet injections
- Epidural injections
- Discogram: Annular Tear at L4/5 with concordant pain
- Nucleoplasty
- IDET
- Intradiscal radiofrequency
- Patient becomes chronic Pain
Physiatrist #2

- Facet Injections
- Epidurals
- Exercise Program
- Patient is functional
Physiatrist #3

- Aggressive exercises
- Education and Psychological support
- Patient is able to manage pain and is functional
Surgeon #1

- CT Myelogram
- Discogram
- Microdiscectomy L4/5
- Exercise Program
- Patient has residual pain but functional
Surgeon #2

- Two level interbody fusion at L4/5 and L5/S1 with pedicle screws
- Patient has residual pain
- Fusion at L3/4
- Patient with more pain
- Spinal Cord Stimulator
- Epidural Pump
- Living with Pain.
You are in control of your patient’s destiny

• Large disc herniation does NOT always need surgery
• Neurologic loss is NOT an absolute indication for surgery
• Small disc bulge is NOT always normal
• Interventional pain management works but not 90% of the time
• Surgery does not have an 80% success rate
• Conservative treatment is reversible. Surgery is not.
Take Home Points

• Stay conservative
• Think conservative
• Early intervention to reduce pain and return to activity
• **Thorough work up but DON’T OVERTREAT**
• Surgery: Cauda Equina, progressively neurologic loss, intractable pain
• Everything else: think NON-Surgical