Spinal Injections and A Rational Approach to Treating Low Back Pain

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Conflicts of Interest

- Dr. Memmo does not have any financial or non-financial conflicts of interest or relationships to disclose, and I will not be discussing products in my presentation.

Dr. Memmo’s CV

- Philosophy (St. Charles Seminary)
- Pre-Med (Columbia University)
- Medical School (Albert Einstein College)
- Internship/Medicine (Columbia Presbyterian Medical Center)
- Physical Medicine (UMDMJ/Kessler)
- Fellowship: Spine/Pain (Beth Israel)
Our Goal
- “Diagnosis”
- “Prognosis”
- “Treatment Plan”

Physiatrist Philosophy
• Getting Patients Functional and Back to Work or Sporting Activity…..
  • …Safely
  • …Reasonably
  • …Incrementally

Two Categories of Spine Pain
• Mechanical Pain
• Neuropathic Pain
Mechanical Low Back Pain

- Discogenic
  - DDD
  - Annular Tear
- Facet Mediated
- SIJ

Neuropathic Pain

- Radiculopathy: Radiating arm or leg pain
  - Disc Herniation
  - Spinal Stenosis
- What can present like a Radiculopathy
  - Sacroiliac Joint
  - Annular Tear

Anatomy
So how do you decide on source of the pain?

- Physical exam
  - Inspection - Atrophy/ Scoliosis
  - Lumbar spine ROM/pain
  - Palpation
  - Sensory exam
  - Motor exam
  - Reflexes
  - Provocative maneuvers

- Radiologic studies
  - X-ray - good for arthritis and bony lesions (if evidence of instability, check flex/ext)
  - CT scan - good for bony lesions/ not so good for soft tissue
  - MRI - good for soft tissue
  - Bone scan - good to determine if fractures are acute as well as bony lesions
Pain Treatments

- Do Nothing
- Physical Therapy
- Medications
- Injections
- Surgery

Pain Treatments

- Physical Therapy
  - Goals include:
    - Lumbar stabilization
    - Lower extremity stretching & strengthening
    - Pain relief / modalities
    - Assistive devices

Pain Treatments

- Medications
  - NSAID’s
  - Muscle Relaxers
  - Pure Pain Medicines
  - Oral Steroids
  - Anti-epileptics / Anti-depressants
Injections – Epidural Steroids

- Benefits of epidural steroids
  - Due to presence of arachnoid villi in epidural space => steroids directly bathe the nerve roots
  - May block “C-fiber” conduction


Injections – Epidural Steroids

- Benefits of epidural steroids
  - Studies have shown that radicular pain may be caused by inflammatory mediators (not just mechanical compression)
  - Steroids inhibit the synthesis/ release of pro-inflammatory cascade and therefore decrease inflammation

Injections – Epidural Steroids

- Controversy
  - No evidence to support that steroids alter the rate of disc regression.
Injections – Epidural Steroids

- Small but not significant difference in favor of Discectomy versus Conservative care (Jama 2006)
- No statistical difference between surgery and non-operative treatment of disc herniation (Clin Orthop Relat Res, 2015)

- Decreasing patient’s pain
- Allows body to heal
- Allows patient to do physical therapy better => helps prevent recurrences
- Maximum of 3 epidural injections in a 12 month period of time.

Fluoroscopy

- Fluoroscope vs. no fluoroscope
  - Blind interlaminar injections are in the wrong place 13-30% of the time without fluoroscopy and contrast (Andrade, ISIS newsletter, 1993, Mehta, Anesthesus 1985).
  - Transforaminal injections not possible without fluoroscopy.
Fluoroscopy

Advantages of fluoroscope
- Increase safety of procedure
- Ensures accuracy of procedure
- Documents procedure for future reference
- Decreases patient’s pain (more comfortable positioning)

Disadvantage of fluoroscope
- Slight exposure to radiation
- Equipment cost

Three ESI Techniques
- Interlaminar (Traditional)
  - Transforaminal ("Selective nerve root block"). Transforaminal ESIs are better for paramedian and foraminal disc herniations (Turk NeuroSurg, 2019)
- Caudal
- A Tuohy needle is advanced under direct fluoroscopic guidance until the ligamentum flavum is encountered.
- A lateral view is checked and then the needle is advanced into the epidural space using the ‘loss of resistance’ technique.
Injections - Transforaminal

**Pros**
- Very Specific - gets medicine anteriorly
- Very Effective for radicular pain
- Smaller needle size / Less pain

**Cons**
- Technical
- Need Fluoroscopy
- Not as effective for back pain
- Risk of nerve damage due to vascular injury
Injections - Caudal

- A 22 gauge needle is guided through the sacral hiatus which lies between the sacral cornu and advanced until it reaches the S2 level.
- Usually requires higher volumes (10-20 cc)
Injections - Which Approach

- For leg pain > back pain = transforaminal
- For back pain > leg pain = interlaminar
- For post surgical = transforaminal vs. caudal
Joint Injections

- Facet Joints aka Zygapophyseal joints (Medial Branch Block & Radiofrequency Lesioning)

- Sacroiliac Joints

Facet Joints

- Z-joints are responsible for prevention of anterior/posterior translation of the spine as well as lateral.
- They are a true joint with articular cartilage and a fibrous capsule.
- Can be affected by RA, OA, AS
- May be related to prior spinal fusion/degenerative changes
Facet (Zygapophysial) Joints
- Cause pain in 10-20% LBP patients
- Symptoms are low back pain/ buttock pain
- Should not radiate past the knee
- Worse with extension
- Better with flexion
Injections - Facet Joints

- The joint is innervated by the medial branch of the dorsal rami at the level of the joint and the one above.

Injections - Facet joints

- Intrarticular joint injection with steroid/anesthetic.
  - Simple
  - Low risk
  - May give long term relief
  - Can be diagnostic

Injections - Facet Joints

- Medial branch blocks
  - Diagnostic only (just anesthetic)
  - Block the nerves innervating the joint you are suspecting. (2 levels for each joint)
  - If patient gets relief then can send for radiofrequency ablation of suspected nerves.
Radio-Frequency Ablation of the Medial Branch Nerves

– Use a nerve stimulator attached to a probe to find the median branches.
– The probe also has a small heating element to cauterize the nerve via an electrical current.
– As long as you know where you need to be with the probe low risk.
– Need RF machine and probes.
RF-Lateral View

Sacroiliac Joint Dysfunction
- True joint
- Should be minimal movement
- Covered by extensive ligamentous structure

Sacroiliac Joint Dysfunction
- Unilateral LBP
- 10-15% of chronic low back pain
- Can radiate to hamstring area, lateral thigh or groin
- Worse with activity/standing
- Better with rest
- Can related to trauma
- L5-S1 disc may mimic symptoms
Treatments - Surgery

- Bowel or bladder changes (cauda equina)
- Progressive weakness
- Progressive/unremitting pain

References

References


Thank You