Imaging Guided Musculoskeletal and Spine Injections

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Musculoskeletal Pain Management

- Treating...
  - Nerve root compression
  - Spinal stenosis
  - Facet disease / cysts
  - Vertebral / sacral fractures
Selective Nerve Root Blocks
Selective Nerve Root Block

- Demonstrated radiculopathy on history and physical
- +/- MRI
- Fluoroscopically targeted injection of a nerve root at the neuroforamen w/wo epidural flow
- Non-particulate steroids!!!
Cervical NRB
Cervical NRB

- Technique
  - Anterolateral oblique approach
  - Fluoroscopically guided
  - Digital subtraction angiographic verification of position
  - < 1 min Fluoro
  - 4% Lidocaine + non-particulate steroid (Dexamethasone)
Cervical NRB

• Complications
  • Infection
  • Spinal epidural hematoma
  • Vascular injury
  • Paralysis / cord infarction
    • None w/ non-particulate steroid (Dexamethasone - < RBCs)
    • Modern technique / Needle positions
Safety - Cervical

- Schellhas AJNR 2007 - Retrospective
- 4612 pts 1994-2007, 6 Proc Rads
- Anterior oblique approach
- Nonionic contrast / Multiple projections
- No serious neurological complications
- 1 Anaphylaxis / 1 Seizure (Recovered)
Safety - Cervical

- Pobiel et al. AJNR 2009 - Prospective
- 802 pts 2006-2007, 8 Proc Rads
- Anterior oblique approach
- Nonionic contrast / Multiple projections
- No serious neurological complications
- 5% (33) Minor complications - Mostly vasovagral
Cases
Cervical NRB

- 52 yo man with right arm pain. MRI shows multilevel degenerative disc disease and stenosis.
- Right C6 NRB w/ TFE requested.
Cervical NRB

- 47 yo woman with right neck and scapular pain. Prior SCNRB’s have provided temporary relief.

- Request made for repeat right C6 NRB w/ TFE.
Lumbar NRB
Lumbar NRB

- **Technique**
  - **Posterior oblique approach**
  - Fluoroscopically guided
    - < 1 min Fluoro
  - Bupivacaine + non-particulate steroid (Dexamethasone)
Lumbar NRB

• Complications

• Infection

• Paralysis / Cord infarction

• None w/ non-particulate steroid (Dexamethasone)

• Needle position should avoid radiculomedullary arteries
Lumbar NRB
Lumbar NRB
Cases
68 yo woman with severe L4-5 DDD, central canal stenosis and bilateral neuroforaminal stenosis. Multiple prior bilateral L4 NRB's provided > 3 months relief.

Request for repeat bilateral L4 NRB w/ TFE.
L/S NRB

- 45 yo woman with severe right L5-S1 neuroforaminal and lateral recess stenosis on recent MRI and right lower extremity radiculopathy.

- Request made for right S1 NRB.
L/S NRB

- After right S1 NRB patient experienced partial relief.
- Based on pre-procedure MRI decision was made to perform a right L5 NRB in addition to the partially successful right S1 block.
Patient experienced elimination of her presenting symptoms following both right S1 and L5 NRBs.
Central Epidural Steroid Injection
Central Epidural Injection

- Symptomatic spinal stenosis
- Multilevel and/or bilateral symptoms
- Post-surgery syndrome
- +/- MRI
Central Epidural Injection

- Technique
  - Posterior approach
  - Fluoroscopically guided
  - $< 1 \text{ min Fluoro}$
  - Loss of resistance technique
  - Bupivacaine / particulate steroid (Triamcinolone)
Central Epidural Injection

- Complications
  - Infection
  - Spinal epidural hematoma
  - Dural puncture / Dural leak
Safety

- McGrath et al. Pain Medicine 2011
- 123 Lumbar injections
- No major complications
- 4% temporarily increased pain / injection site pain
- 2% Other (HA, Flushing)
Evidence

- Manchikanti et al. Pain Physician 2010
  - Effectiveness of lumbar CE injections in managing chronic pain from disc herniation or radiculitis (prospective randomized controlled double blind trial)
- 120 pts Total
- 70 pts / 1 Year Follow up
# Evidence

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<thead>
<tr>
<th></th>
<th>1 Year w/ Retreatments</th>
<th>Anesthetic + Steroid</th>
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<tbody>
<tr>
<td>&gt; 50% Reduction in Pain</td>
<td></td>
<td>86%</td>
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<td>Significant Improvement in Functional Status</td>
<td></td>
<td>83%</td>
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Manchikanti et al. Pain Physician 2010
Cases
Central Epidural Injection

L5-S1 Stenosis
Facet Injections
Facet - Cyst Injection

- Indications
  - Symptomatic facet osteoarthritis
  - Symptomatic facet cysts
  - Symptomatic pars defects
Facet - Cyst Injection

- Technique
  - Fluoroscopically guided
  - CT Guided for tough cases / facet cysts
  - Small volume
    - Bupivacaine + Steroid
Cases
Facet - Cyst Injection

- 54 yo women with left lower extremity radiculopathy traced to a large left L4-5 facet cyst.
Facet - Cyst Injection
Facet Cyst Injection
Facet Cyst Injection

- Elimination of left lower extremity radiculopathy.
Pars Defect Injection

- 18 yo man with chronic back pain related to bilateral L2 pars defects.
Pars Defect Injection

- Near complete relief of presenting symptoms.
- Returned 4 months later for repeat injection, again followed by near complete pain relief.
Joint / Bursa Injections...
Acromioclavicular Joint

Subacromial Bursa
Greater Trochanteric Bursa
Iliopsoas Tendon Sheath
FHL Tendon Sheath
Subtalar Joint
Subtalar Joint
Summary

• Consider Imaging Guided Spine Injections...
  • Diagnostic dilemmas
  • Palliation / Non-surgical candidates
  • Post-operative pain
• Consider Imaging Guided Joint / Tendon Injections...
  • Diagnostic dilemmas
  • Confirmed Tendonopathy / Tenosynovitis
  • Palliation / Non-surgical candidates w/ Arthritis