Back Pain: Value Driven Workup and Treatment

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Disclosures

None
Questions For Today

1. What are the evidence based indicators (timing, red flags, clinical findings) for imaging, both plain films and MRI, in low back pain?

2. What is the evidence for epidural steroid injections in LBP?

3. Are different types of injections more effective for LBP?
Application of “Less Is More” to Low Back Pain
Srinivas, Deyo, Berger
Arch Intern Med 2012;172(13):1016-1020
Indicators for Imaging- Why Care?

- Conscientious spine imaging = #1 on National Physicians Alliance top 5 primary care activities for “Promoting Good Stewardship in Clinical Practice”

- “Don’t do imaging for low back pain within the first 6 weeks unless red flags are present”
Indicators for Imaging- Why Care?

- **Overused and expensive**
  - Lumbar MR imaging up 307% between 1994-2005 (yet increased spine related disability between 1997 and 2005)$^{1,2}$
  - Avoiding imaging in first 6 weeks has potential cost savings of $300 million/year for plain films and MRI combined$^1$

- **Questionable benefit**
  - Poorly correlated with symptoms and outcomes$^{2,3}$
  - Many “abnormalities” found in asymptomatic patients$^{4,5,6}$

- **Harmful**
  - “patient labeling”, chasing incidental findings, radiation, higher surgical rates, higher cost to the patient$^1$
  - Worse outcomes, more disability and decreased sense of well-being$^{1,2,7}$
Indicators for Imaging

Most importantly
Will It Change Management?

Not:
Will it alleviate anxiety?
Will it save me some time?
Will it protect me from litigation?
Will it improve my patient satisfaction scores?
Adapted from ACP/APS guidelines in Roudsari B, Jarvik JG. Lumbar Spine MRI for Low Back Pain: Indications and Yield. AJR. 2010;195;552.
## Red Flag Conditions

<table>
<thead>
<tr>
<th>Possible cx</th>
<th>Hx/PE (RED FLAGS)</th>
<th>Imaging</th>
<th>Additional Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer (0.7%)</td>
<td>H/O CA w/ new LBP</td>
<td>MRI</td>
<td>ESR</td>
</tr>
<tr>
<td></td>
<td>Unexplained wt loss</td>
<td></td>
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<tr>
<td></td>
<td>Fail to improve after 1 mo</td>
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<tr>
<td></td>
<td>Age&gt;50</td>
<td></td>
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<tr>
<td></td>
<td>Multiple risks present</td>
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<tr>
<td>Vertebral Infection (0.01%)</td>
<td>Fever with new LBP</td>
<td>MRI</td>
<td>ESR and/or CRP</td>
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<tr>
<td></td>
<td>IV drug use</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Recent Infection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cauda Equina Syndrome (0.04%)</td>
<td>Urinary retention</td>
<td>MRI</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Motor deficits mult. levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fecal incontinence</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Saddle anesthesia</td>
<td></td>
<td></td>
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<tr>
<td>Severe/Progressive neurological</td>
<td>Progressive motor weakness</td>
<td>MRI</td>
<td>Consider EMG/NCS</td>
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<tr>
<td>deficit</td>
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</tbody>
</table>

Chou 2007
<table>
<thead>
<tr>
<th>Specific causes (non-red flag conditions)</th>
<th>Hx/Exam</th>
<th>Imaging</th>
<th>Additional Studies</th>
</tr>
</thead>
</table>
| Vertebral compression Fracture (4%) | Steroid use  
Osteoporosis  
Older age | X-ray | None |
| Ankylosing Spondylitis (0.3-5%) | AM stiffness  
Improves with exercise  
Alternating buttock pain  
Second half of night pain  
Younger age | X-rays (AP pelvis or SI joint) | ESR and/or CRP (+/- HLA B27) |
| Herniated Disc/Lumbar radiculopathy | Back pain with leg pain in specific nerve root distribution  
+SLR or +CSLR | None | None |
| | Sxs present > 1 month  
(and not improving) | MRI | +/- EMG/NCS |
| Spinal Stenosis | Radiating leg pain  
Older age  
Pseudoclaudication | None | None |
| | Sxs present > 1 month  
(and not improving) | MRI | +/- EMG/NCS |

Chou 2007
Indicators for Imaging: Red Flags

Almost all have identifiable risk factor

- **Metastatic cancer**\(^8, 9\)
  - **History of cancer** (+LR=14.7)
  - Unexplained weight loss (+LR=2.7)
  - Failure to improve after 1 mo (+LR=3.0)
  - Age > 50 (+LR=2.7)

- **Infection**: fever, IV drug use, recent infection, immunosuppression

- **Cauda equina syndrome**: urinary retention (90% sensitivity; if no retention, then probability of CES is 1/10000), saddle anesthesia, LE weakness, gait abnormality

- **Compression fracture**: trauma, older age, **steroid use**, contusion/abrasion (combination reduced false positives)\(^10\)

- **Inflammatory disease**: younger age, morning stiffness, improvement with exercise, alternating buttock pain, awakening due to back pain during second half of night\(^8\)
• Yellow Flags?

● Risk Factors for Chronicity/Disability
  ○ Should not by itself guide decision for imaging
  ○ Depression/Mood issues
  ○ Social issues/poor support network/poor coping
  ○ Work-related issues/litigation/seeking disability
  ○ Sleep disturbance
  ○ Fear-avoidance/Kinesiophobia
  ○ Deconditioning
  ○ Family history of disability/chronic pain
  ○ Early Imaging\textsuperscript{1,2,7,11}
Indications for Imaging: Clinical Findings

- Goal: Identify red flags and evaluate for “severe or progressive neurologic deficits”

- Exam should include L4, L5, and S1 dermatomes, myotomes, and lower limb DTRs

- Above approach thought to capture 99% of serious spinal pathology

\[11\]
1. Will it change management?
2. MD role in LBP = rule out the rare things that can kill or paralyze, then reassure and activate
3. Evidence does not support imaging with a goal of chasing down “pain generators” or alleviating anxiety
4. Early imaging is harmful
5. Little guidance on imaging in chronic LBP
- N=283
- Patients from prospective RCT: Sciatica Trial (surgery vs prolonged conservative care)
- Favorable outcome = complete or nearly complete disappearance of symptoms at 1 year
- Includes both surgical and non-surgical patients

<table>
<thead>
<tr>
<th>At 1 year: MRI findings</th>
<th>Disc herniation</th>
<th>Nerve Root Compression</th>
<th>Scar Tissue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Favorable outcome</td>
<td>35%</td>
<td>24%</td>
<td>86%</td>
</tr>
<tr>
<td>Unfavorable outcome</td>
<td>33%</td>
<td>26%</td>
<td>75%</td>
</tr>
</tbody>
</table>
Epidural Steroid Injections\textsuperscript{12,13,14}

- Axial low back pain without radiculopathy, spinal stenosis, failed back surgery syndrome
  - Sparse/inconclusive evidence, but show no clear benefit (above placebo).

- LBP with radiculopathy
  - Lots of studies
    - Variable short-term benefit; may not be better than epidural saline
      - Best study indicates TFESI significantly better than IMST, TFLA, TFNS, IMNS for radicular pain due to HNP (NNT = 2-3 for >50\% improvement at 1 month, NNT=4-6 for 3 mo, 4-9 at 6 mo, 5-14 at 12 mo)\textsuperscript{15}
    - Very strict inclusion criteria
Epidural Steroid Injections

- Friedly 2008\textsuperscript{16}
  - Large veteran population
  - Mixed diagnoses: HNP, radiculopathy, spinal stenosis, DDD, other LBP syndromes
  - No decrease in opioid use
- No conclusions on return to work\textsuperscript{13}
Epidural Steroid Injections

- No clinical practice guideline (0/18) recommends ESIs for lower back pain without neurological involvement\textsuperscript{11,12}
Other Injections for LBP

- Soft-tissue
- Facet-Specific Interventions
- Disc-Specific Interventions
- Spinal cord stimulator
  - Axial pain not currently an indication
  - No RCTs
  - Low quality studies with mixed results
Soft-tissue Injections for LBP

- Insufficient or poor evidence to support efficacy or make recommendation\textsuperscript{11, 12}
  - 6/18 CPGs recommend against soft-tissue injections
  - 2/18 support use (Belgium)
  - 10/18 cite insufficient evidence (including ACP)

- Soft-tissue Injections
  - **IM steroid** (no good data; not proven better than placebo)
  - **Prolotherapy** (no better than saline or local anesthetic control injections)\textsuperscript{12}
  - **TPIs** (with local anesthetic superior to placebo at 2 weeks only; adding steroid does not improve efficacy; likely no better than acupressure)\textsuperscript{12}
  - **Dry Needling** (probably as good as a TPI)\textsuperscript{12}
  - **Botox** (mixed/sparse/low quality evidence)\textsuperscript{17}
Facet Joint-Specific Injections

- **IA facet injections**\(^{11,12}\)
  - 6/18 CPGs recommend against; 2/18 for; 10/18 insufficient evidence (including ACP/APS)
  - Best study underway and yet to be published

- **Medial Branch Blocks**\(^{11,12}\)
  - Role is more diagnostic than therapeutic
  - No placebo controlled trials for therapeutic effect
  - ACP/APS: Insufficient evidence

- **Radiofrequency Ablation**\(^{11,12}\)
  - Mixed results/difficult to interpret
  - Minimal benefit beyond sham\(^{12}\) or lumbar facet injections\(^{18}\)
  - ACP/APS: Insufficient evidence
  - Landmark trial was observational (N=15)\(^{19}\):
    - 2 differential diagnostic medial branch blocks
    - minimum of 80% relief on each), and precise technique utilized
    - 60% achieved >90% improvement for 12 months
    - No other study has achieved such favorable results
Other Injections for LBP

- **Disc Specific Interventions**
  - Intradiscal injection
  - IDET
  - Nucleolysis

- **No intradiscal procedure has consistently proven better than placebo**
  - ACP recommends against intradiscal steroid injection and poor evidence to evaluate IDET or nucleolysis\(^{12}\)
Other Injections for LBP: Summary

1. Epidural steroid injections are NOT indicated for axial lower back pain
2. NO interventional treatment has consistently proven better than placebo for axial low back pain
3. As of now, it is not clear that identifying a specific “pain generator” and targeting that with an intervention really improves outcomes on a population level
“Less Is More” when it comes to low back pain
- Avoid “poor standards of care”
- “Don’t do imaging for low back pain within the first 6 weeks unless red flags are present”

No interventional treatment has consistently proven better than placebo for axial low back pain
- i.e. very high NNT on population level
- Some limited success with interventions in difficult to identify subpopulations of low back pain
Role of MD in low back pain

- Rule out red flags (things that kill/paralyze)
- Identify factors that may affect treatment response
  - Inflammatory disease
  - Yellow flags (of chronicity/disability)¹⁹
- Error on side of reassurance, encourage movement, and getting back to ordinary activities as normal as possible²⁰
- Fear–avoidance beliefs predict disability better than pain levels or underlying diagnosis²¹
International anti-disability propaganda

- NPR morning edition 1/13/2014: Pain In the Back? Exercise May Help You Learn Not to Feel It

References

References


