Lumbar sympathetic block

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Conflict of interest

- >2 years since industry talks, ad boards.
- Treasurer of the Canadian Neuromodulation Society, receives grants from Medtronic, Boston Scientific, St Jude Medical.

CNS annual meeting Briars Resort
Lake Simcoe June 15-17 2012
Evidence-based review and pearls

• Historical dogma: RSD is sympathetic, should be treated with sympathetic nerve blocks, which can be repeated or the nerves destroyed.
Evidence based review & pearls

• New thinking: CRPS
• Functional restoration the primary goal
• little evidence to support blocks
• Clinically they can work well for some—but why?
• Are there risks?
• Typical CRPS symptoms, other Dx ruled out.
• Prior Rx tylenol, NSAIDS, TCA, Gabapentin, PT, desensitization, stress loading, mirror box & cognitive behavioral
• Unrelieved pain, disability at <6 months
Lumbar Sympathetic Block: Technique

7cm from midline

30 degree Angle medial
Does LSB with local anesthesia work?  
Cochrane (Cepeda/Carr/Lau 2005, rev 2010)

<table>
<thead>
<tr>
<th>Study or subgroup</th>
<th>Treatment n/N</th>
<th>Control n/N</th>
<th>Risk Ratio M-H,Random,95% CI</th>
<th>Risk Ratio M-H,Random,95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price 1998</td>
<td>6/7</td>
<td>6/7</td>
<td></td>
<td>1.00 [0.65, 1.53]</td>
</tr>
<tr>
<td>Verdugo 1995</td>
<td>12/16</td>
<td>8/16</td>
<td></td>
<td>1.50 [0.85, 2.64]</td>
</tr>
<tr>
<td>Subtotal (95% CI)</td>
<td>0</td>
<td>0</td>
<td></td>
<td>0.00 [0.00, 0.00]</td>
</tr>
</tbody>
</table>

Total events: 18 (Treatment), 14 (Control)  
Heterogeneity: Tau² = 0.0; Chi² = 0.0, df = 0 (P<0.00001); I² =0.0%  
Test for overall effect: Z = 0.0 (P < 0.00001)
FIG. 1. Mean visual analog scale ratings of pain sensation intensity after saline and lidocaine anesthetic blocks of sympathetic ganglia in 7 CRPS-I patients. Standard errors are indicated by vertical lines.
<table>
<thead>
<tr>
<th>Patient</th>
<th>VAS units</th>
<th>Before/after block (°F)</th>
<th>VAS units</th>
<th>Before/after block (°F)</th>
<th>Time to return to baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Saline</td>
<td>Lidocaine*</td>
<td>Saline</td>
<td>Lidocaine**</td>
<td></td>
</tr>
<tr>
<td>1. N.G.</td>
<td>5.2 (100)</td>
<td>5.0 (100)</td>
<td>86/86</td>
<td>85/87†</td>
<td>6 hours</td>
</tr>
<tr>
<td>2. J.K.</td>
<td>-0.7 (-13.7)</td>
<td>1.4 (25.9)</td>
<td>90/87</td>
<td>85/88</td>
<td>0 hours</td>
</tr>
<tr>
<td>3. C.R.</td>
<td>2.7 (57.4)</td>
<td>2.8 (58.3)</td>
<td>87/89</td>
<td>88/91</td>
<td>2.5 hours, 18 hours</td>
</tr>
<tr>
<td>4. B.H.</td>
<td>4.5 (50.0)</td>
<td>3.9 (43.8)</td>
<td>88/87</td>
<td>88/92</td>
<td>2 hours, 1 day</td>
</tr>
<tr>
<td>5. L.K.</td>
<td>4.9 (100)</td>
<td>7.0 (100)</td>
<td>90/86</td>
<td>91/97</td>
<td>5 hours</td>
</tr>
<tr>
<td>6. F.B.</td>
<td>2.7 (87.0)</td>
<td>5.4 (93.1)</td>
<td>86/90</td>
<td>90/97</td>
<td>2 days, 5 days, 18 hours</td>
</tr>
<tr>
<td>7. A.R.</td>
<td>2.9 (100)</td>
<td>4.1 (100)</td>
<td>84/85</td>
<td>85/91</td>
<td>3 days, 5 days, 12 hours</td>
</tr>
<tr>
<td>Median</td>
<td>2.9</td>
<td>5.0</td>
<td></td>
<td></td>
<td>6 hours</td>
</tr>
</tbody>
</table>

*Patients 1, 5, and 7 received lidocaine and bupivicaine.
*Not significantly different from saline, p > 0.1.
**Lidocaine/bupivicaine > saline, p < 0.02.
†Lidocaine/bupivicaine > saline, p < 0.01.
Price et al (1998): duration of response to injection (days)
Is LSB just placebo or systemic local effect?

- Petra Meier; Harvard/Boston Childrens’ Anesthesology 2009
- 23 adolescents 10-18yrs, CRPS, epidural and lumbar sympathetic catheters placed. IV or LSB with 1mg/kg up to 60mg/6ml vs saline 12 hours apart.
- Reduced allodynia to brush, pinprick temporal summation & VRS, but NOT spontaneous or evoked pain measures.
Table 2
Changes in Verbal Pain Scores Between Lumbar Sympathetic Blockade and Intravenous Lidocaine Routes

<table>
<thead>
<tr>
<th>Verbal Pain Score</th>
<th>LSB Lidocaine (N = 23)</th>
<th>IV Lidocaine (N = 23)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>Slight Pain</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Moderate Pain</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Severe Pain</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Improvement after*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LSB &gt; IV route</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV &gt; LSB route</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No difference between</td>
<td></td>
<td></td>
</tr>
<tr>
<td>routes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Changes in ordinal pain scores (post – pre) were compared between the different routes of administration.

*Comparison of the results between routes indicated greater improvement following LSB (P = 0.05, Wilcoxon signed-ranks test).

Meier PM, Anesthesiology V 111 No2. 2009
LSB: technical aspects
(or: does the drug go where we expect?)

- Hong (Korea)
  - A&A 111(3) 2010
- 83 patients, 216 injections,
- three needle technique L1, L2, L3.
A Prospective Evaluation of Psoas Muscle and Intravascular Injection in Lumbar Sympathetic Ganglion Block.
Hong, Ji; MD, PhD; Kim, Ae; MD, PhD; Lee, Mi; MD, PhD; Kim, Yong; MD, PhD; Oh, Min

DOI: 10.1213/ANE.0b013e3181e9eb35
Figure 1. Anteroposterior fluoroscopic view. Psoas injections of contrast are shown (black arrows) during lumbar sympathetic ganglion block.

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Incidence psoas spread

\[ P < 0.001 \ (X^2) \]
What is the rate of vascular spread?
(Hong, Anes Analg 2010)

• Negative aspiration:
  – sensitivity = 40.7% (16/195)
  – Specificity = 94.9%

• Negative flow of contrast on static image:
  – Sensitivity = 70.4%
  – Specificity = 100%

• Negative flow on continuous flouro:
  – (reference standard for article, probably <100% sensitive compared to DSA)
Botulinum toxin for LSB?

- Carroll I, Sean Mackey (Stanford) Annals Neurology 2009

- ‘BTA profoundly prolonged the analgesia from sympathetic block in this preliminary study’
Botulinum toxin: be cautious!
Destructive LSB?


Prospective RCT 10 vs 10 patients, no placebo control,

unable to contact author re: late complications

Management of Lower Limb Complex Regional Pain Syndrome Type 1: An Evaluation of Percutaneous Radiofrequency Thermal Lumbar Sympathectomy Versus Phenol Lumbar Sympathetic Neurolysis-A Pilot Study.
Manjunath, Prashanth; Jayalakshmi, T; Dureja, G; Prevost, A

DOI: 10.1213/01.ane.0000298285.39480.28

Figure 1. Change over time in nine pain scale outcomes by randomized group. P values are from the test that mean reduction from baseline is the same in both groups.
Complications of LSB

• Genitofemoral nerve injury
  – L4: 6/15 vs L2: 0/15
    • (Sayson, Reg Anes 22:6, Nov/Dec 1997)
  – Special concern if destructive
• Ureteric injury
Conclusions:

- There is effect to LSB above placebo and systemic, but it might be brief and subtle.
- Even with fluoro the block may be in psoas, or vessels. Consider continuous fluoro.
- Neurolytic block with RF or phenol are likely equal. Unclear if better than local/placebo, unclear long term effects/risks.
- BTA was wonderful in 2-3/7-8 patients. No information on real efficacy, safety.
• Goal of functional restoration*
• Add pain treatments as needed to move forward
• Lowest risk first
• Informed consent: evidence and risks
• Quantify results (‘I am happy that you haven’t abandoned me Doctor’)

*Dr. Edvin Koshi, Halifax, NS