Popliteal Block is Preferable for Major Foot Surgery

Arthur Atchabahian, MD

What is Major Foot Surgery?
• Ankle replacement?
• Ankle fusion?
• “Triple arthrodesis”?
• Subtalar fusion, mid-foot fusion
• Calcaneus ORIF or osteotomy
• Forefoot surgery

Ankle rather than foot

Choices for Regional Analgesia

<table>
<thead>
<tr>
<th>Ankle block</th>
<th>Popliteal (+ saphenous)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distal</td>
<td>Proximal</td>
</tr>
<tr>
<td>No lower leg motor block</td>
<td>Motor block below the knee</td>
</tr>
<tr>
<td>5 injections</td>
<td>2 injections</td>
</tr>
<tr>
<td>Catheter possible (post tib)</td>
<td>Catheter easy</td>
</tr>
<tr>
<td>Plasma levels higher?</td>
<td>My impression...</td>
</tr>
</tbody>
</table>

Ankle Block
Foot and Ankle Surgery

For outpatient foot and ankle surgery, few, if any, substantiated, comprehensive recommendations are available for allocating nerve blocks (single injection vs continuous infusion) based on anticipated postoperative pain, postoperative nursing interventions (with vs without), or unplanned hospital admissions.

Literature Guidance

- Few studies have categorized postoperative foot and ankle pain as sufficiently manageable with SINB versus CNB.
- Most studies evaluating the use of various approaches to the sciatic nerve block for foot and ankle surgery have simply evaluated block success rate (with no comparative treatment group), compared varying popliteal/sciatic nerve block approaches (sometimes with neuraxial techniques), or compared continuous-infusion strategies.

- 260 patients undergoing foot surgery in 1 center from 2009 to 2011
- One year postop:
  - 55 of 260 (21%) patients reported moderate-to-severe pain at rest
  - 111 (43%) moderate-to-severe pain during walking
  - 9 (3%) neuropathic pain
- Independent predictive factors (multivariate analysis):
  - Moderate-to-severe pain during the first postoperative night ($P = 0.048$)
  - Moderate-to-severe pain during the first postoperative day ($P = 0.043$)
  - Revision surgery ($P = 0.001$)
100 patients scheduled for hallux valgus surgery under ankle block

- Blocked tibial, deep peroneal, superficial peroneal, and sural nerves blocked under US guidance
- Sensory innervation area of the saphenous nerve assessed by pinprick

In 97/100 pts, SaN innervation did not reach the tarsometatarsal joint

In the remaining 3 patients, innervation beyond TMT joint by 5, 10, and 15 mm

81 procedures in 71 patients
- 61 blocks by surgeon, 20 by anesthesiologist
- Landmark technique
- ½ 2% lidocaine, ½ 0.5% bupivacaine
Safety and efficacy of forefoot surgery under ankle block anaesthesia

Continuous Infusion Versus Single Bolus Popliteal Block Following Major Ankle and Hindfoot Surgery: A Prospective, Randomized Trial

Bhosle-Elison, MA, FRCS(T&O)/Ortho, Christopher J. Pluym, FRCS(T&O)/Ortho, MSEM(EM)(UK); Chris Seifer, FRCA;
Food & Ankle International 2010

- 54 patients undergoing major ankle & hindfoot surgery
- Popliteal block (NS, 20 mL 0.5% bupi) then catheter infused with either NS or 0.25% bupi (4 mL/hr with 1 mL bolus/hour) x 72 hours

Table 2: Mean Pain Scores on the Three Postoperative Days

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<tr>
<th>Day</th>
<th>Study</th>
<th>Control</th>
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<tbody>
<tr>
<td>1</td>
<td>1.7</td>
<td>3.7</td>
</tr>
<tr>
<td>2</td>
<td>1.3</td>
<td>2.8</td>
</tr>
<tr>
<td>3</td>
<td>1.1</td>
<td>2.6</td>
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Table 3: Morphine Usage on the Three Postoperative Days

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<tr>
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<tr>
<td>3</td>
<td>7.5</td>
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Continuous Infusion
- Ankle arthrodesis: 6
- Hindfoot arthrodesis: 6
- Ankle replacement: 6
- Calcaneal osteotomy + tendon transfer: 4
- Tibio-talo-calcaneal arthrodesis: 3
- Part-talar arthrodesis: 3
- Tendo-Achilles reconstruction: 3

Morphine equivalents DOS: 31.6 mg
VAS 10pm DOS: 1.6
VAS 8am POD1: 4.2
VAS 12pm POD1: 4.1
Duration of block: 21.5 hours

88 ankle blocks
- 50 ml of 0.25% bupivacaine; US-guided posterior tibial
- GA conversion 13.6%
- Morphine equivalents DOS: 31.6 mg
- VAS 10pm DOS: 4.6
- VAS 8am POD1: 5.9
- VAS 12pm POD1: 5.4
- Duration of block: 14.5 hours

Table 2: Median Pain Scores on the Three Postoperative Days

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<tr>
<td>Study Median</td>
<td>1.7</td>
<td>2.1</td>
<td>2.0</td>
</tr>
<tr>
<td>VAS score</td>
<td>3.7</td>
<td>2.8</td>
<td>2.6</td>
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<tr>
<td>p value</td>
<td>0.003</td>
<td>&lt;0.001</td>
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89 popliteal blocks
- 20 mL 0.25% bupivacaine with epi; US-guided; saphenous “when indicated”
- GA conversion 12.7% (NS)
- 18.3 mg (P<0.01)
- 18 hours (P<0.01)
- 20.9 hours (P<0.01)
**Conclusion**

- Intensely painful procedures *(except in the UK...)*
- Both blocks can probably be used with good success *(except ankle joint)*
- **Continuous block** easier and more complete with popliteal
- Only one study comparing ankle vs. popliteal block but for forefoot surgery
  - Better analgesia with popliteal
  - Longer duration with popliteal
- **No motor block** of lower leg with ankle block (but not weight-bearing)
- Overall slight advantage to popliteal

**Thank You**