Posterior Approach for Medial Column Beam Screw in Midfoot Charcot Reconstruction: Technique and Structures at Risk

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Our disclosures are in the Final AOFAS Mobile App.

There is a potential conflict with this presentation due to:
This cadaveric study was funded by DJO Global
Midfoot Charcot Reconstruction

• Fixation Techniques\textsuperscript{1-7}
  – Crossed lag screws
  – Locking plates
  – Axial Beam screws
  – External Fixation
Intramedullary Beam Screws

- Commonly placed in a retrograde fashion starting in metatarsal head.\textsuperscript{2}
- Posterior approach in talus has been described, but with limited research.\textsuperscript{5}
- No literature detailing surgical technique utilizing posterior approach and structures at risk.
Statement of Purpose

• Describe the surgical technique and structures at risk of a posterior approach, medial column beam screw for midfoot Charcot reconstruction.
Methodology

- 10 below-knee cadavers
- Guidewire and cannulated drill percutaneously in posterior-lateral talus
  - C-arm guided
- Anatomic dissection to structures at risk
  - Recorded from the reference point as mean distance, minimum, maximum, and standard deviation
Structures at Risk

- sural nerve
- ankle joint
- FHL tendon
- Achilles tendon
- neurovascular bundle
- peroneal sheath
## Results

### Table 1

<table>
<thead>
<tr>
<th>Anatomic structures at risk for the posterior approach beam screw</th>
<th>Sural nerve</th>
<th>Ankle joint</th>
<th>FHL tendon</th>
<th>Achilles tendon</th>
<th>NVB</th>
<th>Peroneal sheath</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean distance (mm)</td>
<td>2.48</td>
<td>3.62</td>
<td>3.65</td>
<td>3.9</td>
<td>11.96</td>
<td>15.53</td>
</tr>
<tr>
<td>Direct Injury</td>
<td>5/10 (50%)</td>
<td>1/10 (10%)</td>
<td>2/10 (20%)</td>
<td>2/10 (20%)</td>
<td>0/10 (0%)</td>
<td>0/10 (0%)</td>
</tr>
</tbody>
</table>

mm-millimeters; FHL-Flexor Hallucis Longus; NVB-Neurovascular bundle
Discussion

• **High risk of injury**—Sural nerve
  – non-functioning sensory nerve in neuropathic diabetics.
• **Moderate risk of injury**—FHL and Achilles tendons
• **Low risk of injury**—ankle joint
• **Safe structures**—neurovascular bundle and peroneal tendon sheath
• Close attention should be made for the high and moderate risk structures when performing posterior beam screw insertion.
REFERENCES: