Screw in Lisfranc Ligament

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No Conflict to Disclose

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Our disclosures are in the Final AOFAS Mobile App.
We have no potential conflicts with this presentation.
Screw in Lisfranc Ligament

• ‘Lisfranc screw’ is currently used for reduction of diastasis and stabilization of Lisfranc ligamentous injuries

• Screw can be in the path of the ligament or cause disruption at its attachment sites
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Objective:

• To observe the proximity of the Lisfranc ligament to the screw hole made by the ‘Lisfranc screw’

• To observe any disruption at the ligament attachment site
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Materials:

• 15 cadavers; 23 feet
• 40 mm, 4.0, partially threaded cannulated screw (Synthes)
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Methods:

- Soft tissue removed (fig. 1)
- Guidewire inserted in a dorsolateral to medial plantar direction \(^1\) (fig. 2)

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Methods:

- Screw inserted over guide-wire (fig. 3)
- Second metatarsal and medial cuneiform removed (fig. 4)
- Screw removed and ligaments transected (fig. 5)
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Methods:

- Example of no ligament contact in the medial cuneiform (fig. 6) and second metatarsal (fig. 7)
- Example of full penetration of ligament in the medial cuneiform (fig. 8) and second metatarsal (fig. 9)
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Results:

<table>
<thead>
<tr>
<th>Attachment Site</th>
<th>No Contact:</th>
<th>&lt;1mm Contact:</th>
<th>Partial Contact:</th>
<th>Full Penetration:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second Metatarsal:</td>
<td>7 (30%)</td>
<td>6 (26%)</td>
<td>4 (17%)</td>
<td>6 (26%)</td>
</tr>
<tr>
<td>Medial Cuneiform:</td>
<td>5 (22%)</td>
<td>7 (30%)</td>
<td>4 (17%)</td>
<td>7 (30%)</td>
</tr>
<tr>
<td>Combination:</td>
<td>3 (13%)</td>
<td>9 (39%)</td>
<td>4 (17%)</td>
<td>7 (30%)</td>
</tr>
</tbody>
</table>

Percentages rounded to nearest whole number
Screw in Lisfranc Ligament

Discussion:

• ‘Lisfranc screw’ hole came in contact with ligament attachment sites in most specimens 87% vs. no contact in 13%.

• Direction of screw insertion used in this study has been previously reported.

• Variation observed from screw hole being within attachment site to having no contact at all.

• Variations could be due to variation in Lisfranc ligament attachment footprint and/or midfoot arch anatomy.
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Discussion:

- Use of fluoroscopy would have replicated clinical setting, but removing dorsal soft tissue allowed us to see the bones and trajectory similar to the outlines of bones visible on fluoroscopy.

- **Conclusion:** Study shows that disruption at Lisfranc ligament attachment sites is likely to occur with screw insertion.

- **Clinical Relevance:** Poor outcomes of ligamentous Lisfranc injuries could be due to incomplete healing of ligament or disruption from screw.
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References:


Panchbhavi VK. Extra Articular Stabilization of Lisfranc Injury. Techniques in Foot and Ankle Surgery. 7 (2): 100-106; 2008


