DISLOCATION AND INSTABILITY OF THE LESSER METATARSOPHALANGEAL JOINTS AFTER LOCAL CORTICOSTEROID INJECTIONS

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Wendy Benton-Weil, DPM

My disclosure is in the Final AOFAS Program Book. I have no potential conflicts with this presentation.
INTRODUCTION

- Corticosteroid injection:
  - Decreases pain and inflammation
  - Frequently used to treat forefoot pain

- Corticosteroids have been shown to
  - Decreased load and decreased energy to failure in ligaments and tendons\(^1\)
  - Altered histiologic organization of ligaments leading to inferior biomechanical properties\(^2\)

- Therefore, the **purpose of this study** is to:
  - Evaluate the incidence of symptomatic instability and dislocation of the lesser metatarsophalangeal joints following local corticosteroid injection.
METHODS

Retrospective chart and radiographic review:

- January 1995 – December 2010
- Dislocated toes
  - Complete joint incongruity on weight bearing radiographs
  - Clinical exam consistent with dislocated joint
- Unstable toes
  - Subluxation of the 2nd MTPJ on weight bearing radiographs
  - Positive drawer test on clinical exam

- Inclusion criteria
  - Symptomatic instability or dislocation of a lesser MTPJ
  - Full medical records amenable to analysis
  - At least 1 year of follow up

- Exclusion criteria
  - Rheumatoid arthritis
  - Concurrent use of oral steroids
  - History of acute trauma to the 2nd MTPJ
  - Neuropathy
RESULTS

- 198 patients (229 MTPJs) were identified
  - 30 male patients
  - 168 female patients
- Average patient age: $58.7 \pm 10.4$ [range 28 – 90]

<table>
<thead>
<tr>
<th></th>
<th>History – Positive for Steroid Injection</th>
<th>History – Negative for Steroid Injection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dislocated 2\textsuperscript{nd} MTPJ</td>
<td>31/229 (13.5%)</td>
<td>99/229 (43.2%)</td>
</tr>
<tr>
<td>Unstable 2\textsuperscript{nd} MTPJ</td>
<td>26/229 (11.4%)</td>
<td>61/229 (26.6%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>57/229 (24.9%)</strong></td>
<td><strong>171/229 (74.4%)</strong></td>
</tr>
</tbody>
</table>
**RESULTS**

- The first intermetatarsal angle (IM), hallux valgus angle (HV) and second metatarsal protrusion distance (2nd MPD) were evaluated for all patients.

<table>
<thead>
<tr>
<th></th>
<th>IM Angle</th>
<th>HV angle</th>
<th>2nd MPD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unstable 2nd MTPJ &amp;</strong></td>
<td>9.9 ± 2.7</td>
<td>20.1 ± 6.9</td>
<td>4.3 ± 1.4</td>
</tr>
<tr>
<td><strong>History of injection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unstable 2nd MTPJ &amp;</strong></td>
<td>10.9 ± 3.6</td>
<td>22.6 ± 12.1</td>
<td>4.2 ± 1.4</td>
</tr>
<tr>
<td><strong>No history of injection</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>p = .785</strong></td>
<td>p = .179</td>
<td>p = .298</td>
<td></td>
</tr>
<tr>
<td><strong>Dislocated 2nd MTPJ &amp;</strong></td>
<td>12.0 ± 3.0</td>
<td>19.9 ± 8.5</td>
<td>4.1 ± 1.5</td>
</tr>
<tr>
<td><strong>History of injection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dislocated 2nd MTPJ &amp;</strong></td>
<td>11.8 ± 4.5</td>
<td>25.3 ± 14.8</td>
<td>4.2 ± 1.6</td>
</tr>
<tr>
<td><strong>No history of injection</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>p = .456</strong></td>
<td>p &lt;0.01</td>
<td>p = .956</td>
<td></td>
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</tbody>
</table>
Results

- Patients with a history of injection had a significantly lower HV angle than patients who did not have a history of injection.

<table>
<thead>
<tr>
<th></th>
<th>IM Angle</th>
<th>HV angle</th>
<th>2nd MPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients with history of injection</td>
<td>11.4 ± 3.7</td>
<td>20.0 ± 7.2</td>
<td>4.2 ± 1.4</td>
</tr>
<tr>
<td>All patients without history of injection</td>
<td>11.6 ± 4.3</td>
<td>24.6 ± 14.0</td>
<td>4.2 ± 1.5</td>
</tr>
</tbody>
</table>

p = .486
p < 0.01
p = .394
In this case series of 229 unstable or dislocated toes, 57/229 or 24.9% were found to have a history positive for corticosteroid injection therapy.

Radiographic characteristic that was significantly different:
- Hallux valgus angle (p<0.01)

Patients with an increased hallux valgus angle may have an unstable foot where the lesser MTPJs may dislocate as a natural progression of the disease process.

Patients with a lower hallux valgus angle have a more stable foot structure. The injection of corticosteroid into this area destabilizes the soft tissue structures and can lead to dislocation of the lesser MTPJ.
CONCLUSION

- Local corticosteroid injections should be used with caution in the forefoot as this may destabilize the soft tissue structures leading to instability and/or dislocation of the lesser MTPJs.
REFERENCES

