The Relationship between Medial Longitudinal Arch and Peroneal Tubercle

-Anatomical Study-

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My disclosure is in the Final AOFAS Mobile App. I have no potential conflicts with this presentation.
Introduction

- Cause of lateral ankle pain
  - Peroneal tendon problem
  - Ankle instability
  - Sinus tarsi syndrome
  - Fracture
  - Congenital anomaly

- Peroneal tubercle
  - Prevalence: 24-99%
  - Inferior peroneal retinaculum insertion
  - Functioning as a fulcrum directing peronei distally
  - Enlarged tubercle
    - may be related with peroneal tendon pathology
    - known to be associated with foot shape
Purpose

- To determine the relationship between longitudinal foot arch and shape of peroneal tubercle
Material & Method

- Total 81 ankles of 81 subjects
  - M : F -> 49 : 32
  - Age : 52.7 (range: 18-58)
- Subjects were divided into cavovarus group (talus-first metatarsal angle > 7°) and control group with standing lateral X-ray. Then each peroneal tubercle were evaluated with 3D CT data.
- Data was obtained from uninjured side of bilateral ankle CT in patients with ankle fracture under informed consent

- Exclusion Criteria
  - Absent peroneal tubercle
  - Radiographic sign of arthritis
  - Congenital anomaly (ex. Coalition)
  - Recurrent sprain history
  - Past history of prolonged ankle pain
Materials & Methods

- CT scan with resolution of “0.5mm”
- 3D Reconstruction using 3D reconstruction program
Measurements & Results

Measurements - Axial View

Anteroposterior length  Mediolateral width  Axial peroneal tubercle angle

Measurements - Coronal View

Peroneal tubercle height  Mediolateral width  Coronal peroneal tubercle angle
## Measurements & Results

<table>
<thead>
<tr>
<th></th>
<th>Cavovarus group (N=33)</th>
<th>Control group (N=48)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anteroposterior length</td>
<td>13.37 ± 1.41 mm</td>
<td>12.21 ± 1.34 mm</td>
<td>0.22</td>
</tr>
<tr>
<td>Mediolateral width (axial)</td>
<td>4.2 ± 1.80 mm</td>
<td>2.1 ± 1.51 mm</td>
<td>0.048</td>
</tr>
<tr>
<td>Peroneal tubercle angle (axial)</td>
<td>7.5 ± 7.78 degrees</td>
<td>7.3 ± 4.20 degrees</td>
<td>0.081</td>
</tr>
<tr>
<td>Peroneal tubercle height</td>
<td>9.2 ± 3.85 mm</td>
<td>6 ± 2.97 mm</td>
<td>0.042</td>
</tr>
<tr>
<td>Mediolateral width (coronal)</td>
<td>4.3 ± 2.20 mm</td>
<td>1.8 ± 1.13 mm</td>
<td>0.012</td>
</tr>
<tr>
<td>Peroneal tubercle angle (coronal)</td>
<td>5.12 ± 5.20 degrees</td>
<td>4.0 ± 2.43 degrees</td>
<td>0.033</td>
</tr>
</tbody>
</table>
Discussion & Conclusion

- Study about enlarged peroneal tubercle – not many
- Difficult to define peroneal tubercle size and shape with plain x-ray.
  - Further evaluation (MRI, CT) is mandatory for evaluation of peroneal tubercle
- Need to define the natural history of enlarged peroneal tubercle
  - Repetitive irritation??
  - Congenital development??
- Excision of peroneal tubercle
  - No definition of excision range
  - Requirement of peroneal tunnel disruption

Conclusion

- Surgeons should be more aware of the association with peroneal tubercle as a potential source of pain when lateral ankle pain is present in patients with cavovarus deformity.
Reference


