Outcomes after Lengthening Calcaneal Osteotomy for Flexible Flatfoot Deformity – Evans- versus Hintermann-Osteotomy

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Disclosure

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Our disclosures are in the Final AOFAS Mobile App

We have no potential conflicts with this presentation.

We have to disclose:

• One or more of the authors are paid consultants or got financial support direct or to their institution by the following companies:

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• One or more of the authors are board members, of the following institutions:

  German Foot and Ankle Society
Introduction

- Lateral Calcaneal Lengthening Osteotomies (LLCOT) are commonly used to correct flexible pes planovalgus deformity\textsuperscript{1,2,3}
- Mechanism: improving talar head coverage and correcting abduction deformity of the midfoot
- Different techniques for the osteotomy have been described by Evans and Hintermann\textsuperscript{1,2,3}
- Both methods are well accepted with good clinical results
- Hintermann\textsuperscript{1} proposed, that his osteotomy is situated more closely to the center of rotation of the talonavicular joint
  - less pressure in the calcaneocuboid joint
- **Aim:** Compare the clinical and radiological outcomes after Evans- or Hintermann- osteotomy.
Material and Methods

• Retrospective study
• 49 patients included, who were operated for the treatment of flexible flatfoot deformity between October 2008 and March 2014 and had a full clinical and radiological follow-up.
  ➢ 14 Evans and 35 Hintermann osteotomies

• Data: Clinical and radiological examination, clinical scores (FAOS, SF-36)
• Statistics: A paired t-test was used for statistical analysis. A one-way anova with the Holm-Sidak’s multiple comparisons test was used to compare the outcomes of the two osteotomies.
Results

- Clinical examination

<table>
<thead>
<tr>
<th></th>
<th>Evans</th>
<th>Hintermann</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations</td>
<td>14</td>
<td>35</td>
</tr>
<tr>
<td>Age (years)</td>
<td>32.8 ± 17.86</td>
<td>39.6 ± 18.69</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>28.95 ± 2.89</td>
<td>28.00 ± 5.99</td>
</tr>
<tr>
<td>Follow up (months)</td>
<td>67.67 ± 20.57</td>
<td>39.71 ± 12.77</td>
</tr>
<tr>
<td>Return to work (weeks)</td>
<td>14.25 ± 8.92</td>
<td>19.36 ± 16.71</td>
</tr>
<tr>
<td>Return to sports (weeks)</td>
<td>19.0 ± 18.62</td>
<td>28.25 ± 20.07</td>
</tr>
<tr>
<td>Follow-up surgery</td>
<td>7 0</td>
<td>7 0</td>
</tr>
</tbody>
</table>

Table 1: Characteristics of the patients cohorts. After Hintermann osteotomy the mean time to return to work and sports was delayed compared to the Evans group.
Results

• Clinical examination

<table>
<thead>
<tr>
<th>FAOS</th>
<th>Preoperative</th>
<th>Postoperative</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Evans</td>
<td>Hintermann</td>
<td>Evans</td>
</tr>
<tr>
<td>Pain</td>
<td>56.80 ± 17.48</td>
<td>52.94 ± 18.82</td>
<td>76.87 ± 14.78</td>
</tr>
<tr>
<td>Symptom</td>
<td>55.80 ± 17.85</td>
<td>50.25 ± 13.69</td>
<td>64.33 ± 16.00</td>
</tr>
<tr>
<td>ADL</td>
<td>65.87 ± 23.36</td>
<td>67.20 ± 17.62</td>
<td>86.60 ± 17.45</td>
</tr>
<tr>
<td>Sport/Req</td>
<td>36.67 ± 22.49</td>
<td>42.35 ± 22.77</td>
<td>63.67 ± 32.65</td>
</tr>
<tr>
<td>QoL</td>
<td>31.80 ± 16.22</td>
<td>37.09 ± 20.71</td>
<td>62.73 ± 20.62</td>
</tr>
</tbody>
</table>

Table 2: Most of the FAOS subgroups improved significantly postoperatively in both groups. Regarding the subgroup ‘Sport’ the absolute score was almost identical in both groups, but not a significant improvement in the E-group (Tab. 1).
Results

• Clinical examination

Figure 1: SF-36 improved significantly in both groups (p<0.05).
Figure 2: Pre- and 2.5-year postoperative radiographs (Saltzman view a-d, a.p.-ankle e-h) showing a reduction of valgus malalignment after Hintermann- (a+b) and Evans-osteotomy (c+d) as well as a postoperative reduction of the talometatarsal angle after Hintermann- (a+b) and Evans-osteotomy (c+d).
Figure 3: Pre- and postoperative hindfoot alignment and talo-metatarsal angle. The hindfoot alignment and the talometatarsal angle, measured as shown in figure 2, improved significantly in both groups (p<0.05). There was no significant difference between both groups.
Conclusion

• There were no significant differences between the clinical and radiological outcomes of both groups (p>0.05).
• Both surgical techniques lead to
  • a good correction of the flatfoot deformity
  • significant improvement of the clinical and radiological outcome scores.

➢ Neither of these two surgical techniques can be identified as being superior.
References

1 Hintermann, B. Valderrabano, V. Lateral column lengthening by calcaneal osteotomy. Techniques in Foot & Ankle Surgery 2(2):84-90 · June 2003


4 Haeseker, GA., Mureau, MA., Faber, FW. Lateral column lengthening for acquired adult flatfoot deformity caused by posterior tibial tendon dysfunction stage II: a retrospective comparison of calcaneus osteotomy with calcaneocuboid distraction arthrodesis. J Foot Ankle Surg. 2010 Jul-Aug;49(4):380-4