Role of Intraoperative Varus Stress Test for Lateral Soft Tissue Release During Distal Chevron Bunion Procedure

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Disclosure

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My disclosure is in the Final AOFAS Program Book and in the Orthopaedic Surgeon’s Disclosure Program database.

I have no potential conflicts with this presentation.

I have nothing to disclose.
Background

There is ongoing debate whether lateral soft tissue release should be performed in conjunction with distal chevron osteotomy for mild to moderate hallux valgus.

- Lateral soft tissue release allows better correction of the deformity with low incidence of osteonecrosis of the first metatarsal head. (Pochatko et al., Foot Ankle Int 1994; Potenza et al., Foot Ankle Int 2009)

- Lateral soft tissue release does not improve outcomes, increases the risks of osteonecrosis, joint stiffness. (Resch et al., Acta Orthop Scand. 1994; Meier and Kenzora, Foot Ankle. 1985)
Setting an indication for lateral soft tissue release will help to produce better results with less complications in hallux valgus surgery.

Hypothesis

Ability of the hallux to be corrected passively or not would reflect the degree of contracture of the lateral structures. This ability to passively correct the great toe can and should be a factor in deciding to do a lateral soft tissue release in conjunction with a distal chevron osteotomy.
Materials

- August 2005 ~ November 2007
- 48 feet in 43 patients with mild to moderate degree hallux valgus
  - HVA < 35°  1,2 IMA < 15°
  - Incongruent MTP joint
  - Without arthritic changes or systemic disease

Patients were allocated into 2 groups according to the intraoperative varus stress test
Methods

Intraoperative varus stress test

Forefoot is held in one hand with gentle squeeze at the metatarsal heads to reduce the 1/2 IMA while the other hand presses the lateral side of the first interphalangeal joint area to the medial side.

- **Positive:** when the great toe proximal phalanx could be brought back to the long axis of the first metatarsal.
- **Negative:** when the great toe proximal phalanx could not be brought back to the long axis of the first metatarsal.
Methods

Group 1

- Intraoperative varus stress test: positive
- 26 feet in 23 patients (male: 3, female: 20)
- Mean age: 49.2 (41-58) years
- Distal chevron osteotomy
Group 2

- Intraoperative varus stress test: negative
- 22 feet in 20 patients (male: 1, female: 19)
- Mean age: 51.2 (22-62) years
- Distal chevron osteotomy + lateral soft tissue release
Materials

Clinical Assessment

- Radiographic parameters
  - HVA, 1,2 IMA
- AOFAS hallux metatarsophalangeal scale
- Patients’ subjective satisfaction
  - Vert: satisfied, satisfied, improved, dissatisfied
- Complications evaluated
- Paired t-test were used to compared the preop and postop values.

(p<0.05 was considered significant)
## Results

<table>
<thead>
<tr>
<th>Group</th>
<th>HVA</th>
<th>1, 2 IMA</th>
<th>AOFAS score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preop</td>
<td>6 weeks Postop</td>
<td>Last F/U</td>
</tr>
<tr>
<td>Group 1 (n=26)</td>
<td>23.4° (18-28°)</td>
<td>8.2° (4-12°)</td>
<td>10.6° (6-13°)</td>
</tr>
<tr>
<td>Group 2 (n=22)</td>
<td>31.6° (21-35°)</td>
<td>11.4° (8-13°)</td>
<td>12.5° (9-13°)</td>
</tr>
</tbody>
</table>

* n: number of cases
Results

Group 1

- HVA improved at an average of 12.8°
- 1,2 IMA improved at an average of 4.7°
- AOFAS score improved at an average of 29.2 points
- 13 very satisfied, 10 satisfied
- no case of osteonecrosis, hallux varus, recurrence

Group 2

- HVA improved at an average of 19.1°
- 1,2 IMA improved at an average of 7°
- AOFAS score improved at an average of 31.8 points
- 12 very satisfied, 7 satisfied, 1 dissatisfied (stiff MTP joint)
- no case of osteonecrosis, hallux varus, recurrence
When the lateral soft tissue contracture is not severe and the great toe could be brought back to normal alignment passively, than distal chevron osteotomy without lateral soft tissue release would be enough to restore the alignment.

- Shifting the metatarsal head laterally, the relationship between the sesamoids and the metatarsal head will be restored and the tight adductor hallucis tendon will be relaxed to allow the great toe to be corrected without lateral soft tissue release

  Esemenli T et al. Foot Ankle Int, 2003

- Excessive release of the lateral soft tissue is not a single factor creating hallux varus after the surgery but it can be a factor contributing to the risk

  Donley et al. Foot Ankle Int, 1994
When the lateral soft tissue contracture is severe and the great toe could not be brought back to normal alignment passively, lateral soft tissue release is needed to make soft tissue balance.

- Tight adductor hallucis tendon, lateral collateral ligament and capsule may contribute to the recurrence.  
  Deenik et al. Foot Ankle Int, 2008

- Careful operative techniques permits a safe combination of the distal chevron osteotomy and lateral soft tissue release not increasing the risk of osteonecrosis
  Easley et al. Foot Ankle Int, 1996
  Edwards WH. Foot Ankle Clin, 2005
Conclusions

Distal chevron osteotomy with selective lateral soft tissue release based on the ability to passively correct the hallux valgus deformity leads to safe and stable correction.
References


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Pochatko, DJ; Schlehr, FJ; Murphey, MD; Hamilton, JJ: Distal chevron osteotomy with lateral release for treatment of hallux valgus deformity. Foot Ankle Int. 15:457-461, 1994

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