Efficacy of a Kirschner-Wire Guide in Distal Linear Metatarsal Osteotomy for Correction of Hallux Valgus

Department of Orthopaedic Surgery, Faculty of Medicine, Fukuoka University

Takefumi Nishino MD, Ichiro Yoshimura MD, PhD,
Kazuki Kanazawa MD, Tomonobu Hagio MD,
So Minokawa MD, Tetsuro Ishimatsu MD,
Kei Asano MD,
Masatoshi Naito MD, PhD, Professor
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Takefumi Nishino, MD

My disclosure is in the Final AOFAS Mobile App.

I have no potential conflicts with this presentation.
Introduction

Distal linear metatarsal osteotomy (DLMO) is a simple and minimally invasive procedure conducted for mild-to-moderate hallux valgus\(^1\)\(^-\)\(^2\). However, in some cases intramedullary insertion of a Kirschner-wire (K-wire) into the proximal fragment of the first metatarsal may be difficult. Bösch et al. used a bent, grooved stainless-steel probe to place the K-wire\(^3\). Here, we evaluated the efficacy of the K-wire guide (modified Bösch guide).
Surgical procedure

A 1.5-cm skin incision was made centered over the medial aspect of the first metatarsal neck. A 2.0-mm K-wire was manually inserted retrograde from the wound to the medial side of the great toe, then pushed back to the intended site of the osteotomy along the medial aspect of the first metatarsal head. The osteotomy was carried out in a single plane perpendicular to the axis of the first metatarsal shaft. The distal fragment was translated laterally and the K-wire introduced into the medullary canal of the first metatarsal shaft with or without the K-wire guide.
Patients and methods

From 2007 to 2010, DLMO was undertaken in our department independently by the same surgeon on 30 patients with mild-to-moderate hallux valgus deformity (42 feet; 2 males, 28 females; mean age 52.6 (range, 17–85) years).

Patients were divided into two groups: K-wire guide (group K, 26 feet) and non-guide (group N, 16 feet). We investigated the duration of surgery, Japanese Society for Surgery of the Foot (JSSF) scale, hallux valgus angle (HVA), intermetatarsal angle (IMA), and angle of insertion of K-wire (① on anteroposterior view and ② on lateral view).
## Results

<table>
<thead>
<tr>
<th></th>
<th>group N</th>
<th>group K</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cases</strong></td>
<td>13 patients (16 feet)</td>
<td>17 patients (26 feet)</td>
<td>—</td>
</tr>
<tr>
<td><strong>Study period</strong></td>
<td>November 2007 to October 2010</td>
<td>February 2011 to April 2013</td>
<td>—</td>
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<tr>
<td><strong>Preoperative HV angle</strong></td>
<td>$36.7 \pm 5.2^\circ$</td>
<td>$31.4 \pm 8.2^\circ$</td>
<td>0.028</td>
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<td><strong>Preoperative M1M2 angle</strong></td>
<td>$14.6 \pm 2.4^\circ$</td>
<td>$13.2 \pm 3.4^\circ$</td>
<td>0.171</td>
</tr>
<tr>
<td><strong>Preoperative JSSF score</strong></td>
<td>$64.3 \pm 10.5^\circ$</td>
<td>$68.9 \pm 9.6^\circ$</td>
<td>0.150</td>
</tr>
</tbody>
</table>
Mean duration of surgery: 24.2 ± 8.0 min
Duration of surgery for group K (20.8 ± 4.7 min) was significantly shorter than that for group N (29.8 ± 9.3 min) (p=0.0003)
There was no significant difference in the angle of insertion of the K-wire on lateral views, but it was more parallel to the longitudinal axis of the metatarsal in group K than in group N.
Some cases in group N had a large HVA and DLMO took >30 min to complete.

- There was a contracture of the first metatarsophalangeal joint.
- Lateral movement of fragments of the distal bone became large.

- We think that the K-wire guide is more useful in such cases.
Conclusion

- DLMO is undertaken for mild-to-moderate hallux valgus as a simple and minimally invasive procedure but, in some cases, intramedullary insertion of a K-wire into the proximal fragment of the first metatarsal may be difficult.
- The K-wire guide can simplify the surgical procedure and shorten the duration of the procedure.
References

