Plate Fixation in Hallux Valgus Surgery

Purpose of plate fixation for HV surgery:

1. Expand indications of distal MT osteotomies to IMA’s 14-19 degrees.
2. Provide a more rigid internal fixation for earlier mobilization of the 1-MTP joint and forefoot weight bearing.
3. Avoid increased morbidity associated with proximal osteotomies for HV correction.

Background:

General accepted recommendations for distally based osteotomy procedures have been described by many authors limiting HV correction to an IM angle less than 14 degrees.

In general, more severe deformities have been best treated by proximal metatarsal osteotomies; these have been proven mathematically as well as clinically to give the best corrections (2,3).

However, these proximal osteotomies have a higher complication rate, a higher rate of recurrence, and a greater morbidity for the patient postoperatively. They typically require longer periods of immobilization, at times with no weight bearing permitted. Therefore, there is a distinct advantage of a distal metatarsal osteotomy for correction of hallux valgus deformity.

Beskin, J, Murawski (6) Recommended 15-20 mm proximal to articular surface. Up to 90% shift possible.

Figure 1 - Four cortices fixation with two .054 K-wires and up to 90% translation.

The results of the technique reported by Beskin were encouraging, and prompted us to investigate the ability to correct moderate to severe deformity with a distally based metatarsal osteotomy.

Badwey et al(9) reported that the capital fragment can be displaced laterally up to 6 mm in males and 5 mm in females, which constitutes displacement of approximately 30% of the metatarsal’s width. However, Murawski and Beskin (28) concluded after 2 years follow up of 62 patients and 72 procedures that increasing the displacement of distal chevron osteotomy can provide more powerful deformity correction and can be applied to a broader range of preoperative deformity than traditional techniques without increased risk of malunion, recurrence, nonunion, avascular necrosis, or transfer lesions. More recently, a new method of intramedullary fixation for correction of the distal metatarsal osteotomy has been made available (OrthoHelix Mini MaxLock Extreme® ISO™). This plate permits significant shift of the distal metatarsal, giving the surgeon the option of expanding the indication for the distal osteotomy by providing greater stability to the osteotomy, especially when a large translation of the osteotomy is made.
Conclusion:
The historically concept of minor and moderate deformities may be treated by distal osteotomies and the severe deformities are treated best by proximal metatarsal osteotomies is now changing with this new intramedullary plate fixation for distal chevron osteotomies. Correction of severe deformation can be corrected with aggressive chevron Osteotomy and stable Intramedullary Plate Fixation.

References: