The Effect of Various Hallux Valgus Reconstruction on Sesamoid Positioning: A Radiographic Study

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Summary
This is a retrospective radiographic study review of 165 patients with hallux valgus treated with reconstructive osteotomies evaluating the effects of osteotomies and soft tissue release on sesamoid positioning. Radiographic parameters evaluated included hallux valgus angle, intermetatarsal 1-2 angle, tibial sesamoid classification, and lateral sesamoid displacement. This study concluded that basilar and scarf osteotomies provided greater correction of both hallux valgus deformity and tibial sesamoid subluxation. Lateral sesamoid subluxation was not significantly corrected by either osteotomy or soft tissue release.

Introduction
Hallux valgus is one of the most common chronic foot complaints with an adult prevalence of over 23%. The correction of sesamoid subluxation is an important criteria commonly discussed during the evaluation of hallux valgus reconstruction.

Methods
This is a retrospective radiographic study review of 165 patients with hallux valgus treated with reconstructive osteotomies over the past 6 years by two senior foot and ankle surgery attendings at a single institution. Patients included in this study underwent a primary chevron, scarf, or basilar osteotomy for hallux valgus outside the setting of inflammatory arthropathy or lesser metatarsal osteotomy. A modified mcbride release was performed in conjunction with the basilar and scarf osteotomies. Each patient's pre/post operative radiographs were evaluated for hallux valgus angle, intermetatarsal 1-2 angle, tibial sesamoid classification, and lateral sesamoid displacement.

Results
The greatest correction of both hallux valgus and intermetatarsal 1-2 angle was achieved in basilar (20.6/9.7), scarf (14.4/8.7), and lastly chevron (8.9/6.4) osteotomies. Basilar and scarf osteotomies both corrected medial sesamoid subluxation an average of 2-3 classification stages where chevron osteotomies only corrected 1-2 stages. Chevron and scarf osteotomies had minimally greater lateral sesamoid subluxation correction (1.30 mm and 1.27 mm than basilar osteotomies (0.96 mm).

With regards to intermetatarsal 1-2 angle, proximal and scarf osteotomies yielded a significantly greater correction than the chevron osteotomy. Chevron, scarf, and basilar osteotomies each yielded a significantly progressive correction. Basilar osteotomies provided a significantly greater correction in medial sesamoid subluxation when compared to chevron. Scarf osteotomies were not distinct from chevron or basilar osteotomies. There was no statistically significant difference between osteotomy groups with regards to lateral sesamoid positioning. There was also no correlation between tibial and lateral sesamoid subluxation correction.

Conclusions
Basilar osteotomies provide greater correction of hallux valgus deformity and sesamoid positioning. The majority of sesamoid correction results from osteotomy re-alignment of the first metatarsal. The modified mcbride release does not effect correction of sesamoid subluxation and attempts at medial capsular tightening to reduce sesamoid positioning will be unsuccessful.