

Risk Factors for Non-union in First MTPJ Arthrodesis

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Introduction/Purpose: Hallux rigidus occurs in up to 1 in 40 adults with 1st MTPJ arthrodesis being the gold standard operation for advanced disease. Our aim was to retrospectively identify risk factors for delayed / non-union of first metatarsophalangeal joint arthrodesis using a dorsal plate with cross screw.

Methods: Case note and radiograph analysis was performed for operations between April 2014 and April 2016 with at least 6 months post-operative follow up. Union was defined as bridging bone across the fusion site on AP and lateral radiographic views with no movement or pain at the MTPJ on examination. All patients operations were performed or directly supervised by one of three fellowship trained consultant foot surgeons. Surgery was performed through a dorsal approach using a dorsal locking plate with compression screw. Blinded preoperative AP radiographs were analysed for the presence of a severe hallux valgus angle equal to or above 40 degrees. Intra-observer reliability was acceptable (95% CI: 1.6-2.3 degrees). Smoking and co-morbidities underwent univariate analysis for significance.

Following initial result results, surgery in patients with arthritic hallux valgus were fixed using a separate plantar to dorsal / medial to lateral lag screw and dorsal locking plate

Results: 71 patients with a mean age of 61 years (range, 29 to 81) comprised the initial patient group. Mean follow up time was 13 months for both union and nonunion groups (range 6 to 30 months). 7 patients were identified as delayed or nonunion (9.9%). All had hallux valgus angles of >25°. Age, diabetes, COPD and rheumatoid arthritis did not show significant associations with non-union. All smokers progressed to union (n = 17). Moderate to severe hallux valgus (relative risk: 1.29, p < 0.005) and under correction of >25° valgus at the MTPJ (relative risk: 14.44, p < 0.001) were significantly associated with non/delayed union. In the second group, 18 patients of similar demographics, there were no failure of reductions and 100% union rate

Conclusion: Preoperative moderate to severe hallux valgus and under-correction of deformity are the most significant risk factors for non-union. The construct used for fixation needs to be chosen on the basis of the deforming forces. If so, excellent union rates can be achieved