

Instability of the Medial Column Post Triple Arthrodesis for Stage III Posterior Tibial Tendon Dysfunction

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Introduction/Purpose: Triple arthrodesis remains the ideal procedure for management of painful rigid flatfoot deformity. While concurrent extended medial column arthrodesis of either the cuneonavicular joint or the 1st tarsometatarsal joint is occasionally required, they are not routinely performed. We hypothesized that following triple arthrodesis, there will be minimal change in the alignment of the medial column joints. The aim of this study was to examine the effect of the triple arthrodesis on the stability and alignment of the medial column joints.

Methods: This was a retrospective review of 212 consecutive patients who underwent triple arthrodesis between 2002-2013 for correction of painful Stage III flatfoot deformity. Radiographs of the feet were obtained preoperatively, at 6 weeks, 6 months, 1 year, 3 years and 5 years following surgery. The post operative stability and alignment of the medial column was determined by comparing the radiographs over time. Five radiological parameters were studied: medial cuneiform-calcaneus angle (CCA), medial cuneiform-1st metatarsal angle (MCA), 1st/2nd inter metatarsal angle (IMA), medial cuneiform-navicular distance (NCD) and calcaneal pitch angle. These measurements determined the presence of instability in the sagittal plane (CCA and MCA) and coronal plane (NCD and IMA) of the medial cuneonavicular (NC) joint, and the 1st tarsometatarsal(TMT) joint.

Results: Our study demonstrated the presence of medial column instability after triple arthrodesis. This instability was most apparent in the sagittal plane of the NC joint ($P < 0.001$), and was associated with a decreased in the calcaneal pitch ($P < 0.001$). There was a slight decrease in the IMA($P < 0.001$) as well. The coronal plane of the NC joint, and the sagittal plane of the 1st TMT joint remained stable throughout the measurements. The instability is best appreciated in Fig(B) where there is a reduction in the CCA and calcaneal pitch compared to the X-ray in Fig(A) taken 15 months earlier.

Conclusion: The triple arthrodesis procedure corrects the foot deformity, but it is associated with subsequent instability of the medial column mild at the NC joint and abduction of the forefoot at the TMT joints. However, the clinical significance of this instability is not apparent from the study. Since very few patients required subsequent treatment for TMT and NC pathologies after a successful triple arthrodesis, we found insufficient justification for extending the triple arthrodesis distally.

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