Radiographic Correction of Stage III Posterior Tibial Tendon Dysfunction with a Modified Triple Arthrodesis

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Summary:
Operative management of severe, fixed adult flatfoot deformity (Stage III PTTD) can be challenging. This study demonstrates the feasibility of achieving a stable, plantigrade foot with a “modified” triple arthrodesis, using a multiplanar derotational reduction maneuver.

Introduction:
Literature supports fusions as the treatment of choice for stage III PTTD. The present study reports the radiographic correction following a modified triple arthrodesis (fusions of the subtalar, talonavicular, and 1st tarsometatarsal joints) in patients with Stage III PTTD.

Methods:
An IRB-approved retrospective study was performed to assess the radiographic outcome of a modified triple arthrodesis in 21 patients (22 feet). Pre- and postoperative weightbearing radiographs were reviewed in blinded fashion by clinicians of varying levels of training. The talo-first metatarsal, talo-calcaneal, and talo-navicular coverage angles were measured on anteroposterior views. On lateral views, the talo-first metatarsal (Meary’s), talo-calcaneal, calcaneal pitch, and talar declination angles, and medial cuneiform to floor distance were measured. Statistical analysis was performed to compare pre- and postoperative measurements, assess the degree of correction, and determine interobserver reliability of the radiographic measurements.

Results:
All measurements improved significantly after treatment with a modified triple arthrodesis (p≤0.001). The medial cuneiform to floor distance (0.910), talonavicular coverage angle (0.896), and lateral talo-first metatarsal angle (0.873) were the most reproducible between observers. Postoperatively, 100% of feet were corrected to normal medial cuneiform to floor distance and talonavicular coverage angle, and 90.9% were corrected to a normal lateral talo-first metatarsal angle.

Conclusion:
The modified triple arthrodesis offers a reliable and reproducible method of treating rigid stage III PTTD.