Identification of the Medial Column Line collapse variation is Crucial in Flat Foot Management

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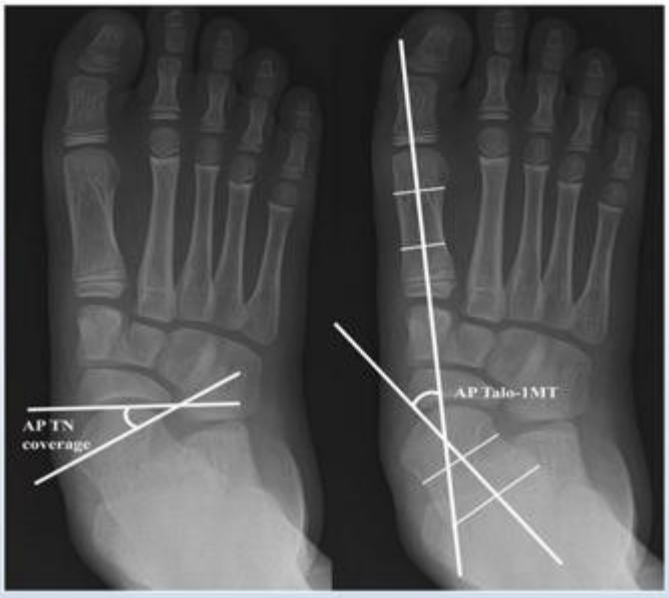
Introduction/Purpose: The incompetence of both dynamic and static structures in the foot is responsible for acquired pes planus deformity. The aim of this study was to identify the anatomical location of the midfoot break in symptomatic pes planus deformity, and its relationship with other pes planus radiographic foot measurements.

Methods: We completed the radiographic evaluation of 75 feet diagnosed with symptomatic pes planus. The break in the medial column line (Meary's line) was measured on the lateral radiograph at the intersection of the anatomical axis of the talus and the first metatarsal. Pes planus measurements were performed on each the weight-bearing AP and lateral radiographs, including talonavicular coverage angle, talar – first/ second metatarsal angle, talar uncoverage, talocalcaneal angle, Meary's angle line break, calcaneal and talar inclination, talocalcaneal angle, cuneiform - metatarsal, tarsal joints angles and distances. Due to Gaussian distribution, unpaired t-test and ANOVA tests were used.

Results: The medial column line collapse was at the talonavicular joint in 77.3%, naviculocuneiform in 20%, and cuneiform metatarsal in 2.6%. The line angle severity was proportional to the talonavicular coverage angle and talar uncoverage (p 0.001, R2 0.4915 and P 0.003, R2 0.223). On comparison of the 3 line-break groups, the talocalcaneal angle was significantly higher when the line break was at talonavicular joint (P 0.001) although Meary's angle was not significantly more severe.

Conclusion: The apex of the medial column collapse occurs not only at the talonavicular joint but also distal to the spring ligament and tibialis posterior insertion. Foot abduction increases with the increase in the line collapse regardless of the breaking point. Talus flexion is worse if the arch collapse is at the talonavicular joint, suggesting incompetency of the spring ligament. Assessing the apex of deformity is essential to decide the correct operative strategy.

Meary's angle measurement and the location of the line break. In this case it is at the talonavicular joint.



Measuring Talus coverage angle and talar 1-metatarsal angle

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