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Analysis of hypermobility of the first metatarsal in hallux valgus deformity: A weight bearing Computed tomography study

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Introduction: The hypermobility of the first ray has been investigated as a possible contributing factor to hallux valgus, but its precise relationship with the condition has not yet been fully clarified. Weight-bearing computed tomography allows us to assess the foot in a three-dimensional and loaded manner, helping us better understand hypermobility. This study aims to evaluate the hypermobility in the sagittal plane of the first metatarsal in individuals with hallux valgus and hypermobility using weight-bearing computed tomography.

Methods: In this prospective study patients with hallux valgus deformity were recruited.The main inclusion criteria were women above 18 years old with hallux valgus, and the main exclusion criteria were other foot and ankle diseases, reumatologic disease, non-idiopatic hallux valgus and disability/contraindication to perform a CT scan. In total 36 patient were confirmed eligible and were imaged by WBCT in a loaded and non-loaded condition. Angular measurements were obtained by using semi-automated software, were we segmented the bones and analyzed the mobility of the first ray bones in three planes of motion.

Results: Although the group with hallux valgus had a higher average of movement on both planes, there was no statistical difference in the mobility of the first metatarsal in the three planes. We observed similar findings in the other bones of the first ray (medial cuneiform, navicular and talus).

Conclusion: We concluded that the mobility of the first metatarsal is not the direct cause of the hypermobility of the first ray. For further studies we suggest analyzing the combine movement of the bones of the first ray to comprehend the hypermobility, and we recommend a bigger cohort to analyze these small movements.

Keywords: Hallux valgus; Joint instability; Tomography, X-Ray Computed.

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