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The impact of medial cuneiform bone variant measures on the severity of hallux valgus - A radiological study

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Background: The aetiology of hallux valgus is multifactorial in nature. The first metatarsocuneiform joint obliquity is a well-known factor in development of the deformity.

Purpose: The purpose of this radiological study is to assess the correlation of different medial cuneiform radiological measures on the severity of hallux valgus.

Methods: Full-weight bearing anteroposterior views of 152 feet with different clinical severity were obtained and were divided into four groups: without deformity, with mild, moderate and severe deformity. Three medial cuneiform angles were assessed. The first metatarsocuneiform angle, the first metatarsocuneiform slope angle and the medial cuneiform lateral tilt angle.

Results: The first metatarsocuneiform angle average values of group 1, 2, 3 and 4 were ($25.16 \pm 5.74^\circ$, $27.38 \pm 6.14^\circ$, $30.27 \pm 5.62^\circ$ and $34.28 \pm 6.81^\circ$) respectively. Statistical differences were detected between groups (1, 3) and (1, 4), $P=0.034$ and 0.001 respectively. The average values of the first metatarsocuneiform slope angle of groups 1, 2, 3 and 4 were ($19.26 \pm 4.97^\circ$, $22.54 \pm 5.62^\circ$, $26.13 \pm 6.36^\circ$ and $32.17 \pm 5.85^\circ$) respectively. Significant differences were detected between groups (1, 3) and (1, 4), $P=0.04$ and 0.023 respectively. Average values of the medial cuneiform lateral tilt angle of groups 1, 2, 3 and 4 were ($80.85 \pm 4.49^\circ$, $74.56 \pm 5.28^\circ$, $62.38 \pm 6.34^\circ$ and $58.78 \pm 6.25^\circ$) respectively. Statistical significances were detected between groups (1, 2), (1, 3) and (1, 4) with $P=0.026$, 0.018 and 0.001 respectively.

Conclusions: Increasing the medial cuneiform lateral tilt increases the first metatarsocuneiform articulation obliquity demonstrated by the increase in the first metatarsocuneiform slope angle which in turn enhances the progression of varus deformity of the first metatarsal bone explained by the increase in the first metatarsocuneiform angle.

Biography

Nihat Acar is a Doctor of Medicine has completed the postgraduate theoretical and practical studies in Orthopaedics and Traumatology at DOKUZ EYLUL University, Faculty of Medicine, Izmir, Turkey in 2004. He has conducted his thesis on biomechanics entitled (The effect of different femoral stem lengths on the femoral bone in hinge type knee prosthesis). He has worked as the head of Orthopaedics and Traumatology department in AL-Azhar University and AL-SHIFA hospital for 5 years since 2009. He has worked with professor Dr. Hasan Havitcioglu the head of Orthopaedics and Traumatology department, faculty of medicine at Dokuz Eylul University in the biomechanical department and conducted many biomechanical researches and papers regarding Spine and Trauma surgery. Currently, he is an orthopaedic consultant at Catalca hospital department of orthopaedics and traumatology in Istanbul – Turkey.

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