Degree of axis correction in valgus high tibial osteotomy: proposal of an individualised approach.

The first purpose of this study was to introduce an individualized, pathology-based approach for the amount of axis correction in valgus high tibial osteotomy (HTO), in which the weight-bearing line (WBL) is transferred in one of three adjacent 5%-areas of the transverse diameter of the tibial plateau. The second purpose was to define the corresponding mechanical femorotibial angle (mFTA) for the margins of each 5%-area. Reported indications for valgus HTO were assorted to one of three groups, based on the underlying pathology and expected accompanying degree of osteoarthritis. Three adjacent 5%-areas on the tibial plateau were defined, ranging from the 50% to 65% coordinate. The medial border of the tibial plateau was defined as 0% and the lateral border was defined as 100%. To define the corresponding mFTA, valgus HTO was simulated in 69 patients using commercial available planning software (mediCAD, Hectec GmbH, Germany). The corresponding mFTA was recorded at four different positions (50%, 55%, 60%, and 65%). Within the purposed approach, the WBL is aimed in one of three 5%-areas (50-55%, 55-60%, and 60-65%) of the transverse diameter of the tibial plateau, according to the underlying pathology. Based on the findings of simulated HTO, the mean mFTA was 0.3° ± 0.2° at the 50% position, 1.3° ± ...
0.2° at the 55% position, 2.4° ± 0.3° at the 60% position, and 3.4° ± 0.3° at the 65% position. The mean difference of the mFTA between each adjacent valgus position was 1.1° ± 0.1°. The present paper introduces an individualized approach to adopt the degree of valgus correction in dependence of the underlying pathology. The area of interest on the tibial plateau lies in between the 50% and 65% coordinate on the tibial plateau, or in between a mean mFTA of 0.3° and 3.4° of valgus, respectively. Differences of the resulting mFTA between each area are small, and therefore a precise surgical technique is mandatory.