Restoring Condylar Width: Radiographic Relationship Between the Lateral Tibial Plateau and Lateral Femoral Condyle in Normal Adult Knees

Nima Kabirian, MD; Daniel Jiang, BS; Mark Fleming, DO; Geoffrey Marecek, MD

Purpose: Anatomic relationships used to determine if condylar width has been restored after surgery are not well described. We hypothesized that a constant radiographic relationship exists between the lateral tibial and femoral condyles.

Methods: Anteroposterior supine knee radiographs of 217 uninjured adults (18-65 years) including 109 unilateral and 108 bilateral knees with no or minimal osteoarthritis were included. The perpendicular distance between the lateral-most margins of the tibial plateau articular surface (A) and the lateral femoral epicondyle (B) and the lateral femoral condyle articular surface (C) was measured in millimeters. Medial and lateral measurements to point (A) were recorded as (-) and (+), respectively. First, the average of distances in all unilateral knees and randomly selected right or left knees from the bilateral group (n = 217) was calculated and compared between sexes. Next, A-B and A-C distances were compared between right and left knees in the bilateral group (n= 108) to find any significant difference.

Results: The average A-B was 0.60 ± 2.40 mm (mean ± standard deviation); range, -4.82 to +6.49. The mean A-C was -3.96 ± 2.07 mm (-8.51 to +3.98). No differences between sexes were found for A-B and A-C. Similarly, no difference was found between A-B and A-C between right (1.08 ± 2.31 and -3.90 ± 1.73) and left knees (0.90 ± 2.38 and -4.31 ± 1.7).

Conclusion: The lateral femoral epicondyle is aligned with the lateral tibial articular margin. The relationship between the lateral tibial plateau, lateral femoral epicondyle, and lateral femoral articular surface is constant from side to side; templating off of contralateral uninjured radiographs may be beneficial in fracture surgery.

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.