
Abstract: We report for the first time the abnormal increases in posterior subluxation of the medial and lateral tibial plateaus after sectioning the posterolateral structures and posterior cruciate ligament. We applied specific forces and moments to the knees of seven cadaveric whole lower limbs and measured the position of the tibia at which the ligaments and the geometry of the joint limited motion. Removal of only the posterolateral structures resulted in an average increase in posterior translation of the lateral tibial plateau of 8.0 mm (range, 5.7 to 10.6) at 30 degrees of flexion over the intact state (P < 0.01), but no significant increase at 90 degrees of flexion (mean, 2.7 mm). Knees with underlying physiologic cruciate ligament laxity (high anterior/posterior displacement in the intact knee) had the greatest lateral tibial plateau subluxation (P < 0.01). There was no abnormal posterior translation of the medial tibial plateau. After sectioning the posterior cruciate ligament and the posterolateral structures, statistically significant increases in posterior translation of both the medial and lateral tibial plateaus occurred at 30 degrees and 90 degrees of flexion (P < 0.01). The increase in posterior translation of the lateral tibial plateau over the intact state averaged 17.8 and 23.5 mm at 30 degrees and 90 degrees of flexion, respectively; for the medial tibial plateau this increase averaged 7.6 and 12.3 mm at 30 degrees and 90 degrees of flexion, respectively. The diagnosis of abnormal tibiofemoral rotatory subluxations requires knowledge of the anteroposterior direction and magnitude of each tibial plateau under both low flexion and high flexion knee angle positions.