The diagnosis of knee motion limits, subluxations, and ligament injury


Abstract: The clinical diagnosis of knee ligament injuries requires the clinician to: 1) estimate the abnormal motion limits that occur in one or more of the six degrees of freedom that comprise three-dimensional motion; 2) determine the abnormal position (subluxation) of the medial and lateral tibiofemoral compartments; and 3) precisely define the anatomical structures injured and degree of that injury. To determine the clinician's ability to perform these tasks, we evaluated 11 knee surgeons' clinical examination for knee instability. The positions and motions included were measured in right-left cadaveric knees by a three-dimensional instrumented spacial linkage. We compared the clinicians' estimate of knee motion limits and subluxations with the actual measured values. Before and after the clinicians' examination, the three-dimensional limits of knee motion were measured in the knees in the laboratory under defined loading conditions. Also, in one knee, the ACL and superficial medial collateral ligament were cut and the examiners, none of whom were informed of the sectioning, were asked to arrive at a diagnosis. The results for all of the clinical instability tests were similar. There was wide variability between examiners in the starting position of knee flexion and tibial rotation and in the amount of tibial translation and rotation induced. Although some examiners displaced the knee to the maximal displacement limits obtained in the laboratory, others did not, by a substantial margin. This suggests a wide variation in the loads applied by examiners to the knee joint during the tests.(ABSTRACT TRUNCATED AT 250 WORDS)