Knee Hyperextension Gait Abnormalities in Unstable Knees. Recognition and Preoperative Gait Retraining


Abstract: Five patients with symptomatic knee hyperextension thrusting patterns due to posterolateral ligament complex injury underwent gait analysis before and after a gait retraining program. Patients were trained to avoid knee hyperextension by 1) walking with their knees slightly flexed throughout stance, 2) maintaining ankle dorsiflexion in early stance, and 3) maintaining an erect trunk-hip attitude during stance. Kinematic and kinetic measurements were obtained using automated gait analysis. Four of the five patients significantly reduced hyperextension at the knee and abnormal motion patterns at the hip and ankle. Patients showed increases in knee flexion throughout stance conversions of knee flexion-extension moments to more normal biphasic patterns with a 79% decrease in extension moments at terminal extension, and a 22% decrease in knee adduction moments. Posttraining values also showed a 30% decrease in the calculated medial tibiofemoral loads (P < 0.05). At the hip, there were significant decreases in abduction and adduction moments (36% and 18%, respectively, P < 0.01). Ankle plantar flexion motion decreased significantly by 42% (P < 0.01). Gait retraining can alter the biomechanics of hip, knee, and ankle function to approximately normal levels, and therefore is recommended before ligament reconstruction because abnormal knee motions, if resumed postoperatively, can stretch soft tissue reconstructions.