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Long-Term Outcomes of Anterior Cruciate Ligament Reconstruction Based on Gait Analysis

Topic: Biomechanics

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BACKGROUND

The available studies of long-term functional outcomes of anterior cruciate ligament (ACL) reconstruction yielded conflicting results. The purpose of the study was to evaluate the biomechanical characteristics of walking in the long term after ACL reconstruction.

METHODS

The study included a group of 18 patients (average 3.4 years from the ACL reconstruction) and a control group of 20 healthy subjects. The gait was assessed using a functional test (voluntary and fast speed). The biomechanical assessments included spatiotemporal and kinematic parameters of walking, as well as surface electromyography (EMG) amplitudes of the main flexor-extensor muscles of the lower extremities.

RESULTS

The fast walking speed and the clearance of the operated limb in the patient group exceeded those in control. The gait cycle in the patient group was significantly longer when walking at a voluntary speed compared to the control group. In the patient group, most of the movements were symmetrical at both speeds, and the parameters did not differ from control. The only exception was the hip joint amplitude and the main amplitude of the knee joint flexion, which significantly and simultaneously increased when walking at a fast speed.

CONCLUSION

In the postoperative period, at voluntary speed, the patient group was characterized by increased amplitudes in the hip and knee joints and higher EMG amplitudes, which almost dis-appeared at higher speed.

Statement of Disclosures

None

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