AP TRANSLATION AND IE ROTATION REDUCTION ANALYSIS BY USING 3D OPTITRACK SYSTEM

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Abstract: Anterior cruciate ligament (ACL) deficiency is the common injury for people involved in sports. ACL injuries directly affect on the knee joint kinematic and function whereby makes the simplest everyday activities difficult (such as walking, stairs climbing, etc).
The aim of this study is to show new objective method for determining knee instability and evaluate the success of the reconstructive surgery.

Kinematic parameters that indicate this type of injury are anterior - posterior (AP) translation and internal - external (IE) rotation. In examining ACL deficiency twenty-nine patients with this type of injury were involved. Kinematic data were collected by using 3D OptiTrack system. The measurements were made the day before and six weeks after reconstructive operation. ACL deficiency decision making was based on descriptive Lachman test and machine learning algorithm. Every injured patient underwent ACL reconstruction with hamstring autograft and anteromedial portal technique.

Results show that higher values of the kinematic parameters occur in the moment of the support loss of the gait cycle. After reconstructive surgery, these values decrease and they are approximately the same to the values of the contralateral healthy knee.

Key words: ACL reconstruction, hamstring autograft, kinematic parameters