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"Gait analysis in the patients with knee ligament injury"

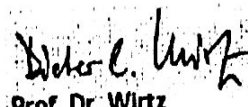
Authors: Ristic, Branko; Matic, Aleksandar; Devadzic, Goran; Petrovic, Suzana; Cukovic, Sasa; Filipovic, Nenad


Category: Trauma lower limb

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EFORT Abstract Submission

Trauma

Trauma lower limb

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Gait analysis in the patients with knee ligament injury

B. Ristic^{1,2}, A. Matic¹, G. Devedzic³, S. Petrovic³, S. Cukovic³, N. Filipovic³

¹K C Kragujevac, ²School of medicine, ³The faculty of Mechanical Engineering, Kragujevac, Serbia

Have you previously submitted this study for another congress?: No

Presentation Method - Preference: E-Poster only

INTRODUCTION: Chronic anterior cruciate ligament (ACL) deficiency change normal gait patterns.

OBJECTIVES: The aim of the study was to present more accurate system (Avatar system) for gait analysis on patients with knee ligament apparatus injury before and after operation of ACL reconstruction.

METHODS: In the study were included 15 male patient with ACL tear of the knee, without concomitant injury of the ipsilateral lower leg.

The movement curves are being obtained on the basis of the markers placed on the patient's lower extremities. The markers' position in space is periodically recorded with infrared cameras. The simulation of the patient's recorded movements is enabled by using the reconstructed model of the femur and tibia and by the curves of movement. The bone reconstruction is based on MRI scans and Hounsfield index. Generated polygonal models are optimized in order to obtain the adequate grid for the translation of the model into the surface and solid phase. The existence of curves that define the movement of the tibia and femur provides us with quite simplified and accurate translation of one bone into the other.

RESULTS: Average translation of the tibia into the femur on the healthy knee was 8.0 ± 2.3 mm, and on the knee with chronic anterior cruciate ligament deficiency was 15.8 ± 3.7 mm. Average translation of the tibia into the femur after ACL reconstruction was 9.1 ± 2.8 mm

CONCLUSION: The results obtained in this research reveal that the more precise diagnosis of the ligament instability can be set. The results also indicate significant decrease of the tibial translation and rotation after ACL reconstruction.

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Disclosure of Interest: None Declared

Keywords: free form modeling, gait analysis, ligament injuries, reverse engineering