سامية محمد مصطفى

شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

سامية محمد مصطفى

شبكة المعلومات الجامعية

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التوثيق الالكتروني والميكروفيلم

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التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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بالرسالة صفحات لم ترد بالأصل

Cairo University
Faculty of Physical Therapy
Department of Biomechanics

Mechanical Changes of Patello-Femoral Joint and Locking Mechanism of Knee Joint after Anterior Cruciate Ligament Reconstruction

By
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Dedication

I would like to dedicate this work to the spirits of my father and my brother Amr, and to the rest of my family who gave me the greatest support and encouragement throughout my life

Rafeek Radwan

بِسْمِ اللَّهِ الرَّحْمنِ الرَّحِيم

وَأَنْ لَيْسَ لِلْإِنسَانِ إِلَّا مَا سَعَى ۞
وَأَنَّ سَعْيَهُ سَوْفَ يُرَى ۞
ثُمَّ يُجْزَاهُ الْجَزَاءَ الْأَوْفَى ۞

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Mechanical Changes of Patello-Femoral Joint and Locking Mechanism of Knee Joint after Anterior Cruciate Ligament Reconstruction, Rafeek E Radwan;, supervisors: Prof. Nahed Salem, Professor in the department of physical therapy for neuromuscular and neurosurgical disorders, vice dean for Social Services and Environmental Development, Faculty of Physical Therapy, Cairo University, Prof. Abd Elaziz Elsengergy, Professor in the Department of Orthopedic Surgery, Faculty of Medicine, Cairo University, Prof. Mamdouh Mahfouz, Professor in the Department of Radio diagnosis, Faculty of Medicine, Cairo University.**(Department of Biomechanics, Cairo university, Master degree, 2004)**

Abstract: This study was conducted to investigate the mechanical changes of the knee complex after ACL reconstruction using patellar tendon graft within three to eight months after the rehabilitation program. The mechanical changes of the tibiofemoral articulation was investigated by measuring the degree of external rotation of tibia upon femur (locking mechanism) during gait at (0%- 2%- 30% and 40%) of gait cycle, which is a very important factor in maintaining the stability of the knee joint and achieving the normal gait pattern recorded, using three dimensional motion analysis (Qualysis system). The mechanical changes of the patellofemoral joint was investigated by measuring the sulcus and congruence angles of the injured side compared with normal side by x-ray imaging using "Merchant" technique which is considered to be the best method for obtaining the proper values for these angles, using a specific design for maintain the knee of the patient at 45° of flexion. Thirty male subjects with ACL reconstruction using bone-patellar tendon-bone auto graft were selected to contribute in this study. The statistical analysis investigated that, the subject with reconstructed ACL has a highly significant decrease in the locking mechanism of the involved knee joint during walking compared with the uninvolved side at initial contact (0% and 2%) and early in the terminal stance at 30% of gait cycle. While there was no significant difference in terminal stance at 40 % of gait cycle. This study also showed that there was a highly significant difference between the kinematics of the patellofemoral of the sound and involved side in the patients with ACL reconstruction that may increase the incidence of patellofemoral disorders. There for it can be concluded that the rehabilitation program should emphasize on regaining the full knee extension and train the patients on the normal sequences of gait especially at the stance phase also an intensive training for quadriceps muscles especially the vastus medialis obliques is of great importance to prevent the patellofemoral disorders after this type of surgery.

Key words: anterior cruciate ligament (ACL), ACL reconstruction, patellofemoral joint, mechanical changes, motion analysis, screw home mechanism.

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