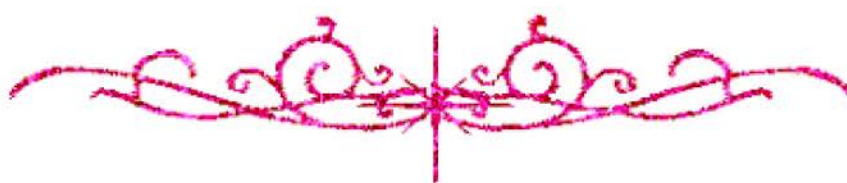


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شبكة المعلومات الجامعية

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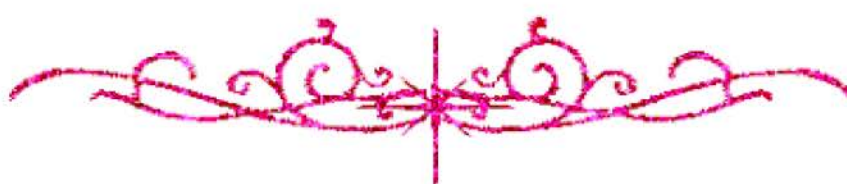
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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

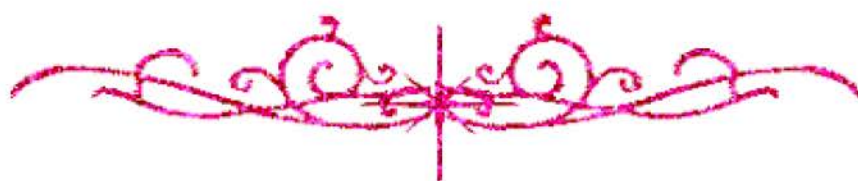
قسم

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



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



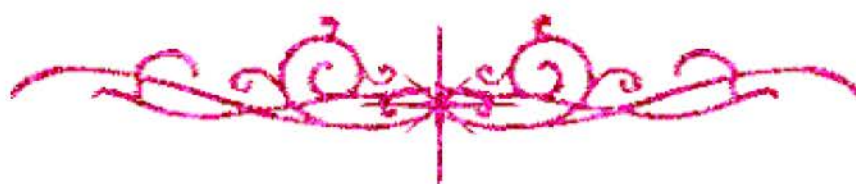
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بعض الوثائق الأصلية تالفة



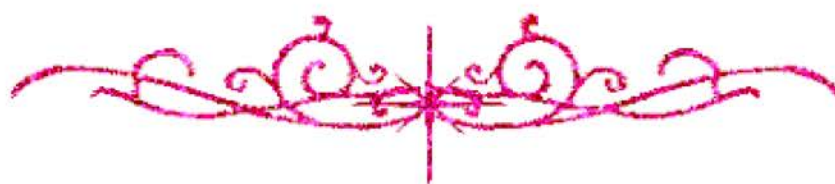
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بالرسالة صفحات لم ترد بالأصل



***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
Rafeek Elmamoon Mohamed Ahmed
B. Sc; (1997), PT., Cairo University

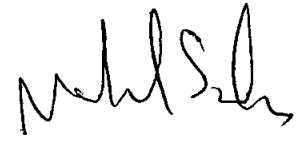
Thesis
**Submitted to the Department of Biomechanics
In Partial Fulfillment for The Requirements
Of Master Degree in Physical Therapy.**

2004

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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 الرَّحْمَنِ الرَّحِيمِ

وَأَنْ لَّيْسَ لِلْإِنْسَانِ إِلَّا مَا سَعَى

وَأَنْ سَعْيَهُ سَوْفَ يَرَى

ثُمَّ يُجْزَاهُ الْجَزَاءَ الْأَوْفَى

سورة النجم الآيات (٤١. ٣٩)

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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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