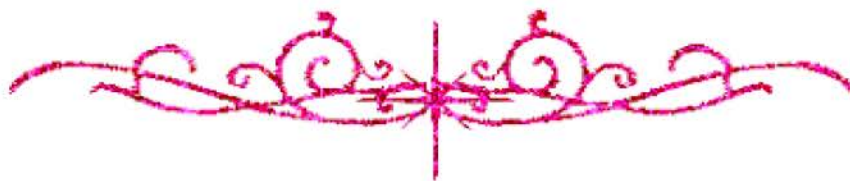


بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

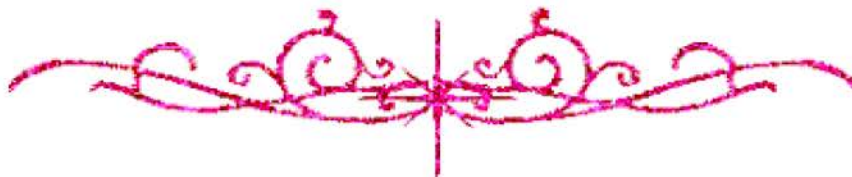
قسم

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



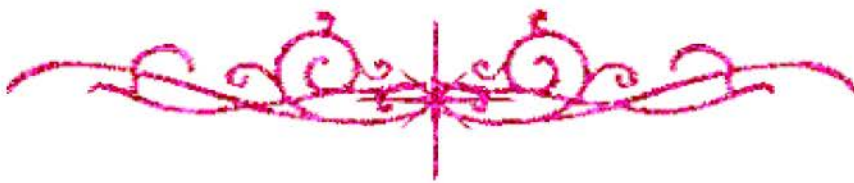
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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



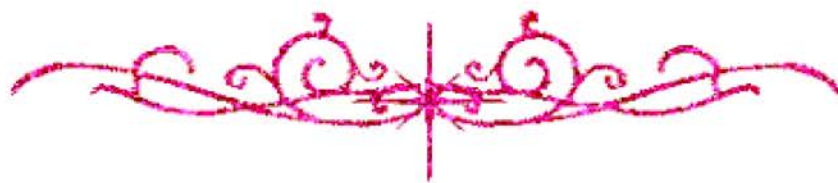


بعض الوثائق الأصلية تالفة





بالرسالة صفحات
لم ترد بالأصل



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CAIRO UNIVERSITY
FACULTY OF PHYSICAL THERAPY
ORTHOPEDIC PHYSICAL THERAPY DEPARTMENT

**PREDICTION OF MECHANICAL PATELLOFEMORAL
DYSFUNCTION AS A RESULT OF MUSCLE
ENDURANCE INSUFFICIENCY IN
PATIENTS SUFFERING FROM
ANTERIOR KNEE PAIN**

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To
My wife Dina,
my daughter Marina,
and my son Mina
for their tolerance and
help during this work

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Lastly, great thanks for the patients in this study wishing them healthful life and long lasting cure.

PREDICTION OF MECHANICAL PATELLOFEMORAL DYSFUNCTION AS A RESULT OF MUSCLE ENDURANCE INSUFFICIENCY IN PATIENTS SUFFERING FROM ANTERIOR KNEE PAIN

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Abstract

Patellofemoral Pain Syndrome is a broad term describing and inclusive of all pathology related to the anterior knee. All of these conditions tend to be grouped together due to the common related symptomatology of classic insidious onset of diffuse knee pain made worse by squatting, kneeling, sitting with knees in flexion, and rising after long periods of sitting.

The purpose of this study was to find out if there is a relationship between endurance insufficiency of the quadriceps and hamstring muscles and maltracking of the patella in sedentary individuals. And to find also, if disturbance of normal hamstring-quadriceps ratios affects patellar tracking. The study was carried

out by investigating the hamstring-quadriceps endurance and their ratios in subjects complaining of anterior knee pain after strenuous activities and to compare these results with subjects whom had no history of knee pain or injury.

Forty volunteers subject (23 females and 17 males) with a previous history of unilateral anterior knee pain and ranged in age from 22 to 47 years. And forty healthy volunteers (22 females and 18 males) their ages ranged from 23 to 48 years participated in the study as a control group. Subjects of both groups were sedentary or participated in a low level of physical activity. Both groups were not athletes and did not have prior experience on the isokinetic apparatus. The affected knee was examined manually for patients group and the knee of the dominant leg for control group. Patellar examination included; grating, inhibition, gliding, and tilting tests were done. Apprehension sign was also detected. Manual muscles testing was carried out for quadriceps and hamstring muscles and both groups had grade 5. Patients and healthy subjects were examined radiographically by Merchant technique just before performing strenuous activities by isokinetic machine. The sulcus and congruence angles were measured on the x-ray film.

The endurance of quadriceps and hamstring muscles was detected. It was evaluated by measuring the means of the peak torques of knee flexors and extensors. Also, the ratio between them was calculated. Measuring the peak torques for maximal effort and repetitions done by the subject, is considered to be an indicative method in testing muscles endurance especially when done concentrically and eccentrically at both low and high angular

velocities. Another radiographic study by Merchant technique was carried out just after finishing the endurance testing. It was done for the detection of the occurrence of patellar deviation from its normal tracking after these exhausted testing.

It was noticed that, in the patients whom had anterior knee pain and endurance insufficiency for knee flexors and extensors, the congruence angle was obviously deviated ($\bar{X} = 9.45 \pm 3.11$) while for control group, the deviation was not found in some individuals but other had moderate deviation ($\bar{X} = 2.2 \pm 3.46$).

This study stated that there is a close relationship between the muscle endurance insufficiency and consequently decrease in hamstring-quadriceps ratio and patellar maltracking. So, hamstring-quadriceps endurance insufficiency is considered a predisposing factor for patellar maltracking. This maltracking may lead to patellar cartilage derangement as patellar chondromalacia, osteoarthritis, or subluxation.

The results of this study provide the base information about early detection of patellofemoral maltracking, to avoid more deterioration of the case that may be time and financial consuming. It may be appropriate; therefore to use a standardized hamstring-quadriceps ratios as a goal of successful rehabilitation for patients suffered from patellar tracking dysfunction.

Key Words: Patellofemoral, Malalignment, Muscle Insufficiency, Isokinetics, Endurance insufficiency, and anterior knee pain.

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