Department of Biomechanics

Doctoral Degree
2008

Author	**:**	**Ahmed Salamah Yamani.**
Title	**:**	**Gait and balance deviations following unilateral hip arthroplasty.**
Dept.	**:**	**Department of Biomechanics.**
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Degree	**:**	**Doctoral.**
Year	**:**	**2008.**
Abstract	**:**	

Objectives: The purposes of this study were: (1) to recognize any deviations in vertical displacement of center of gravity secondary to unilateral hip arthroplasty, (2) to detect the changes in the measurements of horizontal ground reaction forces, (3) to explore any changes in hip and knee abduction moments, inversion and eversion moments around ankle, (4) to determine any impairments in dynamic stability control following unilateral hip arthroplasty. Subjects: 20 hip arthroplasty patients and 10 healthy matched volunteers participated in this study. Methods: Three dimensional motion analysis system and force plate were used for kinematic and kinetic parameters assessment. Biodex balance system was used for testing the dynamic balance. The results gained from the hip arthroplasty patients were compared with those from the healthy matched volunteers. Results: There was insignificant difference (P<0.05) in vertical displacement of COG between hip arthroplasty patients and healthy subjects. The horizontal shear forces for the operated side were less than those for non-operated side and healthy subjects. The hip and knee abductor moments significantly decreased for the operated side in comparison with non-operated side. In addition, inversion and eversion moments around ankle significantly decreased for the operated side. Conclusion: Patients with hip arthroplasty are less stable during free walking than healthy subjects. In addition, impairments around hip, a knee and ankle joints should be considered during establishment of rehabilitation programs for patients with hip prosthesis.

Key words	**1.**	**Kinematics.**
	2.	**Kinetics.**
	3.	**Gait analysis.**
	4.	**Hip Arthroplasty.**
	5.	**Balance.**
Arabic Title Page	**:**	**إنحرافات المشى والإتزان بعد تغيير مفصل الفخذ.**
Library register number	**:**	**1779-1780.**

Author	**:**	**Ahmed Yousry Radwan.**
Title	**:**	**Mechanical compensations of lower extremity following anterior cruciate ligament reconstruction using autogenic hamstring muscle graft.**
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Abstract	**:**	

To adequately absorb shock during the landing phase of both jogging and forward hopping, there is rapid increase in summated extension moments of lower extremity joints. This increase was found to be significantly lower in persons who had ACL reconstruction procedure using patellar tendon auto graft. The purpose of the study was to investigate the extension moments of subjects who had ACL reconstruction procedure using semitendinosus auto graft during the landing phase of both jogging and forward hopping. Kinetic gait parameters were collected from both operated and non-operated lower extremities of 9 male subjects who had ACL reconstruction 6 months ago (mean age 28.3 ± 6.7, mean height 1.77 m ± 0.09, and mean weight 83.4 kg ± 9.7) and 9 matched normal subjects. A within-subject design was selected to compare the operated and non-operated sides. Bilateral lower extremity kinetic data were collected during jogging and forward hopping. Data were analyzed using paired t-test with an alpha level of 0.05. There was no significant difference ($p > .05$) in the summated extension moment values between the operated and non-operated lower extremities during jogging with means of 3.28 ± 0.76 and 3.88 ± 0.82 respectively ($r= 0.753$, $p < .05$). This result may indicate that at the end of the rehabilitation period, subjects undergoing this operative technique were able to adequately absorb the shock imposed on their lower extremities during jogging.

Key words	**1.**	**ACL (anterior cruciate ligament) .**
	2.	**Reconstruction.**
	3.	**Extension moments.**
Arabic Title Page	**:**	**التكافؤات الميكانيكيه للأطراف السفليه بعد عملية إعادة بناء الرباط الصليبي الأمامي بإستخدام طُعم مأخوذ من الجانب الأنسي للعضله الإسكيه الساقيه.**
Library register number	**:**	**1743-1744.**

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Author	**:**	**Anees Saleh Soliman Ghiet.**
Title	**:**	**Assessment of balance in normal subjects and in patients with diabetic neuropathy receiving a training program.**
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Year	**:**	**2008.**
Abstract	**:**	

The purpose of the study was to determine the difference in the measurements of balance between normal, diabetes without neuropathy and with neuropathy. Also determine the effect of balance training program on these patients. Forty five subjects contributed in this study divided into three groups, normal, diabetes without neuropathy and with neuropathy, each group consisted of fifteen subjects. The three groups were assessed on the balance system. The second and third group were trained on the balance system for two months and reassessed again. The results of the study revealed that there is decrease in balance in both second and third group. Also there was a significant difference between the balance parameters in the group two post treatment than pre treatment, this indicates that there was improvement in balance. There was no significant difference between the balance parameters in the third group post and pre treatment, this indicated that there was no improvement of balance in the third group after receiving the balance training program.

Key words	**1.**	**Controlled diabetes without neuropathy.**
	2.	**Uncontrolled diabetes with neuropathy.**
	3.	**Balance.**
Arabic Title Page	**:**	**تقييم الاتزان في الأصحاء وفي مرضي التهاب الأعصاب السكري الخاضعون لبرنامج تدريبي.**
Library register number	**:**	**1797-1798.**

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