

**ELECTRONIC GUIDE TO THESES APPROVED BY
DEPARTMENT OF BIOMECHANICS
PREPARED BY NERVEEN ABD EL SALAM ABD EL KADER AHMED**

Department of Biomechanics

**Master Degree
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Title	:	Mechanical changes of patello-femoral joint and locking mechanism of knee joint after anterior circulate ligament reconstruction.
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Abstract	:	
<p>This study was conducted to investigate the mechanical changes of the knee complex after ACL reconstruction using patellar tendon graft . The mechanical changes of the tibiofemoral articulation was investigated by measuring the degree of external rotation of tibia upon femur during gait at (0% - 2% - 30% and 40%) of gait cycle , 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 . 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. 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.</p>		
Key words	1.	knee joint.
	2.	Anterior cruciate ligament.
	3.	ACL reconstruction.
	4.	patellofemoral joint.
	5.	Mechanical changes.
	6.	Motion analysis.
	7.	Screw home mechanism.
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