

## 8th International Conference on Surgeons

### Postural Alterations after Anterior Cruciate Ligament Surgery

Dr Veerle Rotsaert MD, FEBOPRAS, FCCP,  
Université de Paris,  
France



#### Abstract (600 Words):

The aim of this study was to compare static postures of a knee anterior cruciate ligament reconstruction (ACLR) population with a healthy control population. Thirty-five patients (age 25.5 +/- 5.8 years) were compared at 15 days after an anterior cruciate ligament reconstruction with 35 healthy, age and sex-matched subjects. Bilateral and unilateral postures were studied according to various stances, knee extension and 20 degrees knee flexion with opened and closed eyes, using a stabilometric platform. A comparison with the non-ACLR limb and the healthy limbs of the control population was carried out. The ACLR subjects present with the following: (i) a significant change in two-legged stance, i.e. distances covered by the centre of pressure projection are significantly increased; (ii) a postural alteration during the ACLR one-legged stance with

knee extension and opened eyes in comparison with the non-ACLR limb; (iii) an incapacity for certain ACLR subjects to perform one-legged stance on the non-ACLR limb when there is no visual compensation. Only 11.4% (95% CI: 0.9-21.9%) and 42.8% (95% CI: 26.3-59.3%) of ACLR subjects are capable of maintaining correctly a one-legged stance posture with closed eyes on both sides (knee extension and flexion, respectively). The identification of the ACLR knee limb is possible from the one-legged stance postural test in knee extension and opened eyes condition. Because of a change in two-legged balance and of the incapacity for certain ACLR subjects to maintain one-legged stance with closed eyes, a central origin explaining the abnormalities of postural control is suggested.

#### Importance of research (200 words):

The incidence of ACL injury is high among young, active, individuals with the most frequent medical management being surgical reconstruction. Injury to the ACL results in biomechanical changes at the tibiofemoral joint as well as deficits in proprioceptive feedback and sensorimotor function. While ACLR may successfully restore the mechanical stability of the knee; the resolution of certain proprioceptive measures and its importance in return to sport decision-making, remains controversial. Proprioception of the knee joint as defined by Lephart et al<sup>7</sup> is afferent information from the joint that contributes to sensation, posture and joint stability. Various assessment tools were traditionally used to quantify deficits in proprioceptive function after ACL injury and focused on static measures of joint position sense or the patient's ability to detect the onset of passive motion. Collectively, these authors suggested the presence of altered position sense and deficits in movement perception after ACL injury as well residual impairments after ACLR. However, some authors have argued that these assessment methods lacked applicability to assess functional status, as they frequently use passive movements, assessed in non-weight bearing positions..

#### Info of Institute and laboratory (200 words):



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### Biography (200 words):

Dr Veerle Rotsaert MD, FEBOPRAS, FCCP, is the co-founder of London's aesthetic destination, Tempus Belgravia, and has quickly becoming one of the capital's go-to female plastic surgeons. Rotsaert obtained her medical degree Magna cum Laude from the University of Leuven in Belgium. She ranked first at the final Belgian Plastic Surgery Board Exam and qualified as a fellow of the European Board of Plastic Surgeons. After establishing a successful career in her homeland (Belgium), Dr Rotsaert travelled the world, completing her plastic, aesthetic and reconstructive surgery training at renowned institutions in the United States, Australia and Sweden. Prior to that she studied and trained as a Registrar in Belgium, Spain and the UK at the prestigious Chelsea and Westminster Hospital. She also perfected her skills and techniques by pursuing fellowships with some of the most renowned specialists in the field, including Dr Timothy Marten, Dr Dino Elyassnia, Professor Anand Deva and Julie Horne, who is regarded as the leading lip enhancement trainer in the world. Now performing her ground-breaking procedures in Central London, what sets Dr Rotsaert apart is the care and attention she gives to her patients and the time she spends in really getting to know each and every patient. She believes that building trust is crucial to ensuring the best possible treatment outcomes and prides herself above all on her five-star aftercare. She is only happy when her patients are happy..

### Reference:

1. Frank CB, Jackson DW. The science of reconstruction of the anterior cruciate ligament. *J Bone Joint Surg Am.* 1997 Oct;79(10):1556–1576.
2. Barrack RL, Skinner HB, Buckley SL. Proprioception in the anterior cruciate deficient knee. *Am J Sports Med.* 1989 Jan-Feb;17(1):1–6.
3. Co FH, Skinner HB, Cannon WD. Effect of reconstruction of the anterior cruciate ligament on proprioception of the knee and the heel strike transient. *J Orthop Res.* 1993 Sep;11(5):696–704.
4. MacDonald PB, Hedden D, Pacin O, Sutherland K. Proprioception in anterior cruciate ligament-deficient and reconstructed knees. *Am J Sports Med.* 1996 Nov-Dec;24(6):774–778.
5. Johansson H, Sjolander P, Sojka P. A sensory role for the cruciate ligaments. *Clin Orthop Relat Res.* 1991 Jul;(268):161–178.
6. Kvist J. Rehabilitation following anterior cruciate ligament injury: current recommendations for sports participation. *Sports Med.* 2004;34(4):269–280.
7. Lephart S, Riemann BL, Fu FH. Introduction to the Sensorimotor System. In: Lephart S, Fu FH, editors. *Proprioception and Neuromuscular Control in Joint Stability.* Champaign: Human Kinetics; 2000.
8. Friden T, Zatterstrom R, Lindstrand A, Moritz U. Disability in anterior cruciate ligament insufficiency. An analysis of 19 untreated patients. *Acta Orthop Scand.* 1990 Apr;61(2):131–135.
9. Hewett TE, Paterno MV, Myer GD. Strategies for enhancing proprioception and neuromuscular control of the knee. *Clin Orthop Relat Res.* 2002 Sep;(402):76–94.
10. Mattacola CG, Perrin DH, Gansneder BM, Gieck JH, Saliba EN, McCue FC., 3rd Strength, functional outcome, and postural stability after anterior cruciate ligament reconstruction. *J Athl Train.* 2002 Sep;37(3):262–268.
11. Lamoth CJ, van Lummel RC, Beek PJ. Athletic skill level is reflected in body sway: a test case for accelometry in combination with stochastic dynamics. *Gait Posture.* 2009 Jun;29(4):546–551.
12. Schmit JM, Riley MA, Dalvi A, et al. Deterministic center of pressure patterns characterize postural instability in Parkinson's disease. *Exp Brain Res.* 2006 Jan;168(3):357–367
13. Bonfim TR, Jansen Paccola CA, Barela JA. Proprioceptive and behavior impairments in individuals with anterior cruciate ligament reconstructed knees. *Arch Phys Med Rehabil.* 2003 Aug;84(8):1217–1223.
14. Okuda K, Abe N, Katayama Y, Senda M, Kuroda T, Inoue H. Effect of vision on postural sway in anterior cruciate ligament injured knees. *J Orthop Sci.* 2005 May;10(3):277–283.