Neural control of knee laxity in functional tasks after an ACL reconstruction

Published: 14-02-2018
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The aim is to uncover possible muscle activation patterns to control the active ATT after an ACLR.

Ethical review	Approved WMO
Status	Pending
Health condition type	Tendon, ligament and cartilage disorders
Study type	Observational non invasive

Summary

ID

NL-OMON46731

Source
ToetsingOnline

Brief title
Neural control of knee laxity after an ACL reconstruction

Condition

- Tendon, ligament and cartilage disorders

Synonym
Anterior cruciate ligament reconstruction; knee ligament surgery

Research involving
Human

Sponsors and support

Primary sponsor: Bewegingswetenschappen
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Anterior cruciate ligament reconstruction, Anterior tibia translation, Knee laxity,

Neuromuscular control

Outcome measures

Primary outcome

The main study parameters will be:

- The passive and active anterior tibia translation.

- Muscle activity of the lateral and medial hamstrings, lateral and medial

gastrocnemius, rectus femoris, medial and lateral vasti.

- The slope of the tibia plateau.

Secondary outcome

The secondary study parameters will be:

- Sagittal knee angles

- Sagittal knee moments

- Ground reaction forces

- The Beighton score, a scoring system for joint laxity and hypermobility

Study description

Background summary

Despite improvements after an anterior cruciate ligament (ACL) reconstruction (ACLR), return to sport rate is only 1/3 one year after surgery. Some patients might manage to return to sport (copers) because they might develop strategies to compensate for the increase in anterior tibia translation (knee laxity or ATT) in an active situation. They might compensate by effective muscle activation patterns, whereas other patients who do not manage to return to sport (non-copers) might rely more on the strain of the ACL. This suggestion can be supported by the finding of Kvist (2005) that there is no correlation between passive ATT and active ATT, which suggests that the ATT during activity is controlled by other factors than the strain of the ACL, i.e. muscle activation patterns or the anatomy of the knee. It might be that the ATT is related to the slope of the tibia plateau. The current study will add to the

literature knowledge about the control of the ATT in an active situation in ACLR patients. It is hypothesized that copers can compensate for an increase in active ATT after an ACLR by developing effective muscle activation patterns in agreement with their anatomy, whereas other patients cannot compensate for the results of the injury.

Study objective

The aim is to uncover possible muscle activation patterns to control the active ATT after an ACLR.

Study design

Three studies will be conducted. The designs of the studies will be observational studies. Measurements for all studies will take place in the same session. The session takes about one hour where participants are measured in a gait lab. Participants will undergo a passive test of anterior- and posterior tibia translation* (KT-1000 arthrometer) and perform an active test (single hop for distance). Next, to the experimental tests, a short questionnaire with general questions and questions about sports resumption will be filled in by the patients. Patients will be tested one to two years after ACLR. The slope of the tibia plateau will be measured using MRI*s or, if MRI*s are not available for a participant, X-Ray*s, already taken before surgery (care as usual).

To validate the method to determine the anterior- posterior tibia translation, one patient with a total knee arthroplasty, without possibility to anteriorly and posteriorly translate the tibia relative to the femur, will be tested.

Study burden and risks

Forty participants will be tested in one session which will take about one hour. Minimal risk or discomforts, as physical injury or harm, to the subjects as a result of each procedure is involved in the studies.

Contacts

Public
Selecteer

Antonius Deusinglaan 1
Groningen 9713AV
NL
Scientific
Selecteer

Antonius Deusinglaan 1
Groningen 9713AV
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Patients after an anterior cruciate ligament reconstruction using an autograft hamstring tendon
Patients between 18-45 years of age
Patients between 12 and 24 months after surgery

Exclusion criteria

Serious cartilage damage of the lower extremity
Revision anterior cruciate ligament reconstruction
Osteotomy of the tibia or femur
Contralateral anterior cruciate ligament reconstruction
Other self-reported orthopedic or neurologic disorders that impair lower limb function.

Study design

Design

Study type: Observational non invasive
Masking: Open (masking not used)

Control:	Uncontrolled
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-03-2018
Enrollment:	40
Type:	Anticipated

Ethics review

Approved WMO Date:	14-02-2018
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)
Approved WMO Date:	28-09-2018
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL64438.042.17