

An in-vivo gait analysis of the effect of different femoral tunnel positions in anterior cruciate ligament (ACL) reconstruction on knee rotational movement

Submission date 02/02/2009	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered
Registration date 13/03/2009	Overall study status Completed	<input type="checkbox"/> Protocol
Last Edited 13/03/2009	Condition category Injury, Occupational Diseases, Poisoning	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data
		<input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Not provided at time of registration

Contact information

Type(s)

Scientific

Contact name

Prof Anastasios Georgoulis

Contact details

University of Ioannina
Medical School
OAKI
Georgiou Papandreou 2
Ioannina
Greece
45221
oaki@cc.uoi.gr

Additional identifiers

Protocol serial number

N/A

Study information

Scientific Title

An in-vivo gait analysis of the effect of different femoral tunnel positions in anterior cruciate ligament (ACL) reconstruction on tibial rotation: a prospective case-series

Study objectives

We hypothesised that a more horizontal placement of the anterior cruciate ligament (ACL) substitute graft (at the 10 o'clock position in the femur) can address abnormal rotational knee movement after an ACL reconstruction, as compared to the standard 11 o'clock femoral position.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Scientific Committee of the University Hospital of Ioannina, approved on 26/05/2008

Study design

Observational prospective comparative case-series, single-centre

Primary study design

Observational

Study type(s)

Treatment

Health condition(s) or problem(s) studied

Anterior cruciate ligament (ACL) rupture and reconstruction, knee injury

Interventions

Twenty ACL reconstructed subjects (mean age: 28 +/- 8 years) and ten healthy subjects (mean age: 29 +/- 5 years) were enrolled in this study. The ACL reconstructed subjects were tested as follows (on average) 2 years after the surgery.

1. Knee muscle strength measured with BIODEX System-3® (Biodex Corp., USA) isokinetic dynamometer
2. Clinical evaluation:
 - 2.1. Patient's level of activity measured with the Tegner test
 - 2.2. Patient's knee functional scale measured with the Lysholm test
3. Anterior tibial translation was evaluated using the KT-1000™ Arthrometer® (MEDmetric Corp., USA) for both ACL reconstructed subjects and the healthy controls.
4. An eight camera optoelectronic system (Vicon-Peak Performance Technologies, Inc., UK/USA) was used to capture the movements of fifteen reflective markers placed on the selected bony landmarks of the lower limbs and the pelvis of the examined subjects. The subjects were asked to perform two different activities: 1) descending from a stair and subsequent pivoting, and 2) landing from a platform and subsequent pivoting. We also placed inline foot switches (Noraxon Inc., USA) with two sensors on each, on the plantar surface of the shoes in the toe and heel positions. Foot-switch data collection was time-synchronized with the kinematic data through the Vicon-Peak® digital transceiver. The signals provided from the foot-switches were used to determine the exact time occurrences of the start and the end of the pivoting period that was under evaluation. Based on our hypothesis, the dependent variable examined in the present study was the range of motion of tibial rotation during the pivoting period for the two examined tasks.

Intervention Type

Other

Phase

Not Applicable

Primary outcome(s)

The following were assessed at 2 years after ACL reconstruction:

1. Tibial rotation (kinematics) measured with the gait analysis system
2. Tibial translation measured with KT-1000™ Arthrometer®
3. Patient's level of activity measured with the Tegner test
4. Patient's knee functional scale measured with the Lysholm test

Key secondary outcome(s)

The following were assessed at 2 years after ACL reconstruction:

1. Knee muscle strength measured with BIODEX isokinetic dynamometer
2. Knee joint stability measured with static tests (Lachman, anterior-drawer, pivot-shift)

Completion date

10/05/2008

Eligibility**Key inclusion criteria**

1. Males
2. Patients with ACL reconstruction with a bone patellar tendon bone (BPTB) graft
3. Healthy subjects

Note: Participants with similar anthropometric features and age group were selected for this study in order to minimise bias

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Adult

Sex

Male

Key exclusion criteria

1. Patients with concomitant injuries (e.g., chondral lesions, lateral collateral ligament injuries or meniscal injuries in which a meniscectomy or a suture of the meniscus was performed)
2. Patients with symptomatic anterior knee pain or objective instability at the latest follow-up examination (positive pivot-shift test results, positive Lachman-test results and arthrometer side-to-side differences of more than 3 mm)

Date of first enrolment

10/08/2005

Date of final enrolment

10/05/2008

Locations

Countries of recruitment

Greece

Study participating centre

University of Ioannina

Ioannina

Greece

45221

Sponsor information

Organisation

University of Ioannina (Greece)

ROR

<https://ror.org/01qg3j183>

Funder(s)

Funder type

University/education

Funder Name

University of Ioannina (Greece)

Results and Publications

Individual participant data (IPD) sharing plan**IPD sharing plan summary**

Not provided at time of registration

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes