

Reference

Schmalz, T., Blumentritt, S., Drewitz, H.

Research Department, Otto Bock HealthCare GmbH, Göttingen, Germany.

Die Nutzung von Unterschenkelorthesen im Rahmen der konservativen Behandlung der Gonarthrose

The application of orthoses for the lower leg in conservative treatment of gonarthrosis

MOT: Medizinisch Orthopädische Technik 2011; 5: 68-78.

Products

Agilium Freestep (Prototype)

Major Findings

With Agilium Freestep

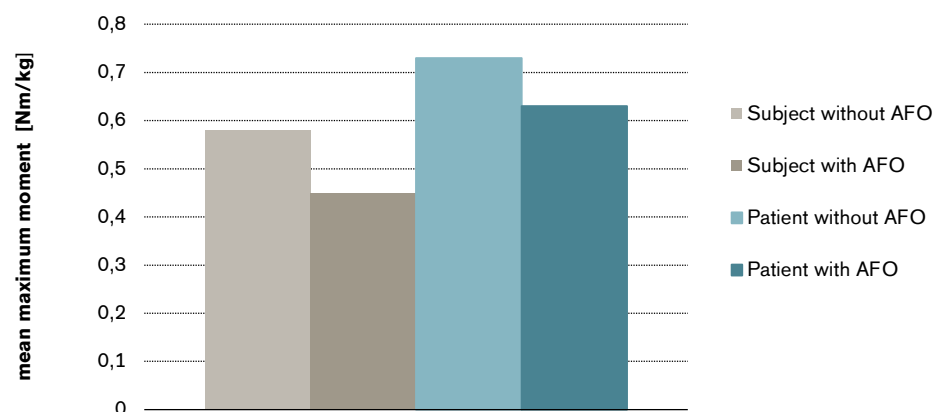
→ **Knee pain could be reduced by 51% ($p \leq 0.01$)**

→ **Compliance could be increased**

→ **Static: the vertical component of the ground reaction force (GRF) shifts significantly towards lateral direction (frontal plane)**

→ **Dynamic: the knee adduction moment could be reduced significantly**

Mean maximum knee adduction moment during walking



Population

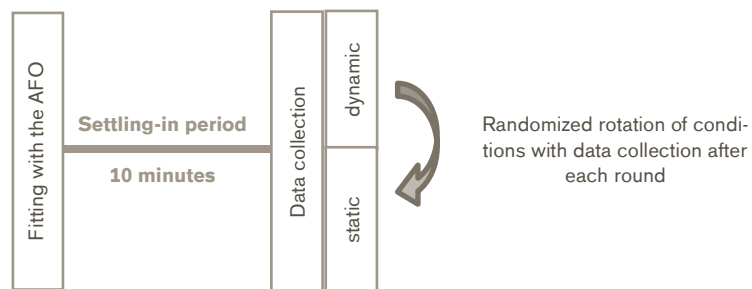
Subjects: 12 Patients
Mean age: 64.3 ± 11.8 years
Gender: 7 male, 5 female
Inclusion criteria: Medial knee osteoarthritis
OA classification: OA grade 2 and 3 (1x grade 4)

Control-Group: 10 healthy subjects
Mean age: 32.3 ± 7.5 years

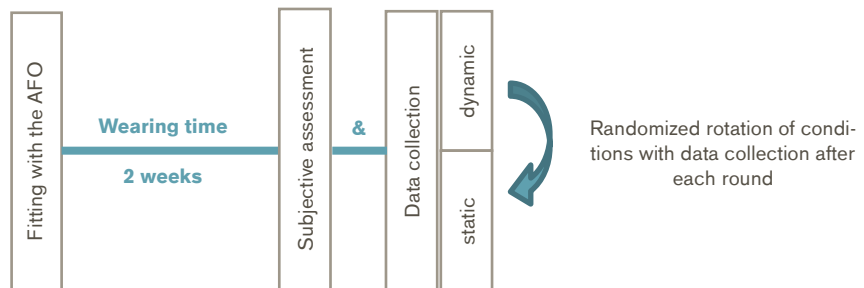
Study Design

Comparative, randomized:

Subjects



Patients

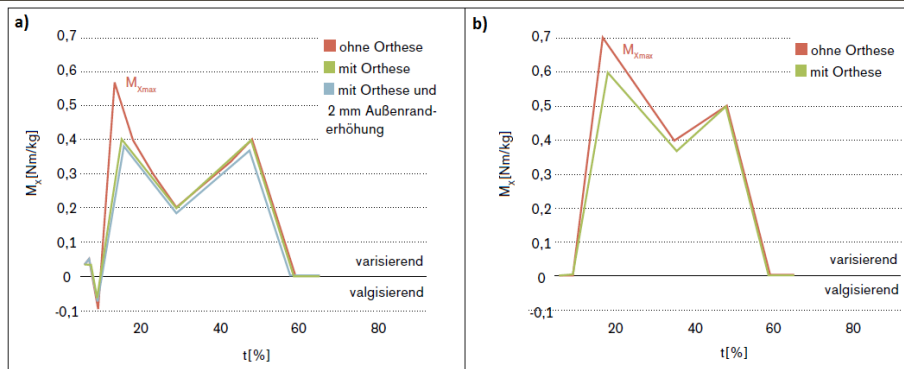


Results

Functions and Activities						Participation
Biomechanics – Static measures	Biomechanics – Gait analysis	X-Ray	EMG	Functional tests	Clinical effects	Satisfaction
Category	Outcomes	Results for Agilium Freestep compared to no orthosis			Sig.*	
Biomechanics – Static measure	Knee lever arm in the frontal plane					
	Subjects		Lateral shift of 11mm (from 15±12 to 26±11 mm)		++	
	Patients		Lateral shift of 13mm (from -7±15 to 6±14 mm)		++	
Biomechanics – Gait analysis	Knee adduction moment					
	Subjects		reduced by 22% (from 0.58 to 0.45 Nm/kg)		++	
	Patients		reduced by 14% (from 0.73 to 0.63 Nm/kg)		++	

Functions and Activities						Participation
Biomechanics – Static measures	Biomechanics – Gait analysis	X-Ray	EMG	Functional tests	Clinical effects	Satisfaction

Category **Outcomes** **Results for Agilium Freestep compared to no orthosis** **Sig.***



Mean torque $M_{x_{max}}$ acting in the frontal plane at the knee joint, a) in healthy subjects and b) in patients with OA of the knee

Clinical effect	NAS (0= no pain ... 10= extreme pain), mean value during gait		
	Patients	reduced by 51% (from 7.7 ± 1.8 to 3.8 ± 1.8 points)	++
Satisfaction	Compliance		
	Patients	Could be increased	n.a.

* no difference (0), positive trend (+), negative trend (-), significant (++/--), not applicable (n.a.)

Author's Conclusion

"The treatment of patients with osteoarthritis of the knee with the new AFO seems to be an alternative to the conventional orthoses for gonarthrosis. The clinical outcomes and biomechanical effects are equivalent to those measured with conventional orthoses, but the compliance is probably increased." (Schmalz et al. 2011)

"In der Versorgung von Gonarthrose-Patienten mit der vorgestellten Unterschenkel-Orthese ist eine alternative orthetische Versorgungsmöglichkeit zu den bisher bekannten Gonarthrose-Orthesen zu sehen. Die klinischen Resultate und der biomechanische Effekt hinsichtlich der Belastungsreduktion sind knieübergreifenden Orthesen mindestens gleichwertig, die Akzeptanz durch den Patienten ist jedoch mit hoher Wahrscheinlichkeit erhöht." (Schmalz et al. 2011)

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