

Reference

Brüggemann G-P, Heinrich K, Liebau C, Ellermann A, Potthast W, Rembitzi I.
Institut für Biomechanik und Orthopädie, Deutsche Sporthochschule Köln.

Patella-Re-Zentrierungs-Orthese Patella Pro Biomechanische Evaluation: ex vivo und in vivo (Patella recentering orthosis Patella Pro Biomechanical evaluation: ex vivo and in vivo)

Proceedings of the ISPO World Congress, Leipzig 2010.

Products

Patella Pro® vs. Genu Train

Major Findings

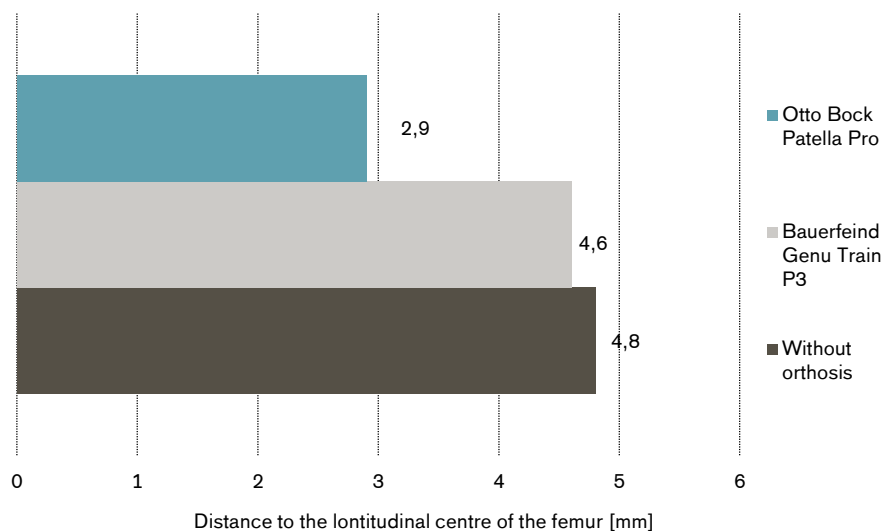
With Patella Pro:

→ **The patella was medialized in the knee flexion range of 45° – 0°**

Compared to Bauerfeind Genu Train: 9.5 times greater medialization

Compared to without orthosis: Reduced lateralization by 40%

Reduced lateralisation with Patella Pro



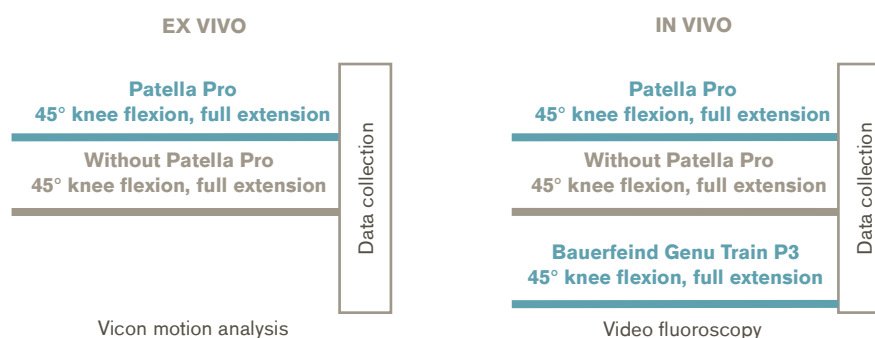
The lateralization of the patella was analysed with video fluoroscopy.

Population

Ex vivo:	6 cadaver legs (66-72 yrs)
Subjects (in vivo):	7 patients with patella femoral pain syndrome and clinically diagnosed patella instability
Mean age (in vivo):	34.5 yrs (\pm 7.6 yrs)

Study Design

Observational, comparative:



Ex vivo: Quadriceps was connected to three pneumatic actuators and moved with 100 N per muscle. Retroflective markers were attached on the femur, the patella and the tibia. Lateralization, tilt and rotation of the patella were measured for the knee flexion range of 45-30°, 30-15° and 15-0°.

In vivo: The patients flexed their knees under full or partial load to 45° and then extended them. The lateralisation of the patella in relation to the femur was measured.

Results

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

Category	Outcomes	Ex vivo Results for Patella Pro	Sig.*
Biomechanics – Static measures	Knee flexion 45-30°	Medialization of the patella by 1.04 ± 1.05 mm.	+
	Knee flexion 30-15°	Medialization of the patella by 1.57 ± 1.76 mm.	+
	Knee flexion 15-0°	Medialization of the patella by 1.66 ± 1.73 mm.	+
		In vivo Results for Patella Pro	
	Knee flexion 45°-0°	Significantly reduced lateralization of the patella by 40% compared to the flexion without an orthosis. The medialization was 9.5 times greater than with Bauerfeind Genu Train P3. Without the Patella Pro the lateralization was 4.8 ± 4.9 mm and 4.6 ± 6.7 mm with the Bauerfeind Genu Train P3.	++

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

Author's Conclusion

“The functional principle of the Patella recentering orthosis was confirmed by the ex vivo study with the preparation. Although the differences were not statistically different due to the different shapes of the trochleae and therefore high standard deviations of the mean values, the efficiency of the mechanism of the orthosis and the possibility of a progressive recentering of the patella could be demonstrated in 4 out of 6 cases. In patients with patella instability and patellofemoral pain syndrome (PFPS) the patella was significantly medialized with the Patello Pro compared to the neutral and the control condition (BA¹ orthosis). These results are according to previous published studies which did not find a significant influence of the BA but of

medializing orthoses on the lateral shift of the patella and the reduction of anterior knee pain in patients with PFPS. It can be concluded, that the Patella Pro orthosis can contribute to a reduction of PFPS. With this study the mechanism of the progressive medialization and recentering of the patella by the Patella Pro was tested and the clinical application in patients with patella instability was shown. It shall be noted that it is remarkable that all previous clinical trials confirmed the biomechanical results and clinical effectiveness. A systematic review of the clinical results will be presentable soon." (Brüggemann et al., 2010)

¹ Bauerfein Genu Train

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