

Power-Plate stimulates recovery after anterior cruciate ligament (ACL) rupture

Research shows using the Power-Plate expedites recovery of muscle performance after ACL rupture. Combination with conventional physiotherapy, exercises on the Power-Plate lead to improved muscular power, enhanced proprioceptive abilities and stabilization of the knee joint (articulatio genu).

By J.D. Bastian, W. Franz
Lutrina Klinik, Department of Knee Surgery, Kaiserslautern, Germany

This is a summary of a study published in the German Magazine for Sportsmedicine - Deutsche Zeitschrift für Sportmedizin®, Vol. 56, No. 7/8 (special abstract issue), p. 228: "Empirical study of the effects of whole body vibration after arthroscopic reconstruction of the ACL" - "Erfahrungen mit Ganzkörpervibrationstraining nach arthroskopischer Rekonstruktion des Vorderen Kreuzbandes".

Conclusions:

- Six weeks after the operation, the group that performed additional WBV training did not show significant reduction of the muscle thickness 10 and 20 cm proximal to the patella, as the control group did.
- Twelve weeks after surgery the WBV group was more satisfied with the results of the operation.
- The answers they provided on their questionnaires also indicated that they were experiencing less pain than the control group.
- We conclude that additional Power-Plate therapy is significant for anyone wanting to recover as quickly as possible from this kind of surgery in order to get back to normal daily activities such as work and sports.

In general, a major problem after reconstruction of the ACL of the knee is the weakness of the m. quadriceps femoris. The aim of this study was to examine the effects of additional whole body vibration (WBV) on an oscillating platform (Power-Plate). In this study we built on the successful outcomes of previously published work: WBV leads to an increased co-activation of the extensor and flexor muscles of the lower extremities, it has positive effects on joint stabilization and it improves circulation.

Methods:

16 subjects were divided between a vibration group (n=7, physiotherapy and vibration) and one control/

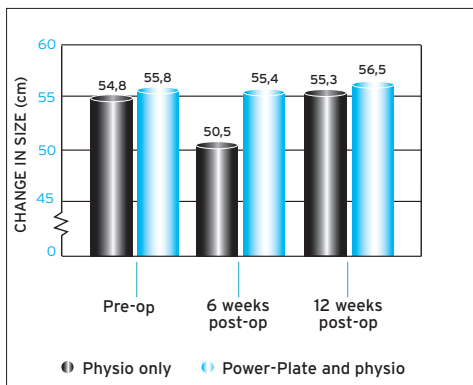
conventional group (n = 9, physiotherapy only). Any contraindications for vibration training were taken into consideration.

The training program for the conventional group followed the routine schedule after ACL rupture (2 - 3 times per week, squats and lunges). The WBV group performed a ten-minute schedule twice a week for ten weeks, beginning in the third week after surgery, in addition to normal physiotherapy. After warming up by doing a massage for quadriceps and hamstrings, the schedule consisted of a squat and a lunge, followed by a stretching exercise for the hamstrings.

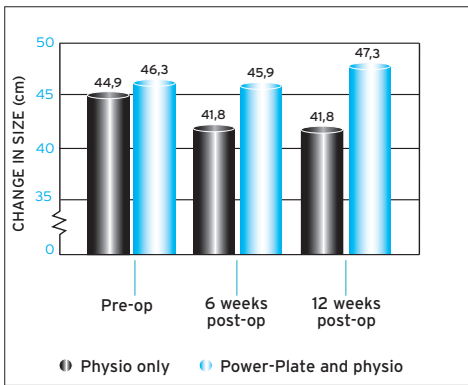


Measurements of the leg circumference (10 and 20 cm proximal, as well as 15 cm distal of the patella) (fig. 1) were taken pre-operative, immediately after surgery and after 6 and 12 weeks. To estimate the success of the therapy, subjective evaluations of pain perception and health were assessed by having all subjects filling in a questionnaire (SFA = Flandry score).

Circumference quadriceps 20 cm proximal



Circumference quadriceps 10 cm proximal



Circumference gastrocnemius 15cm distal

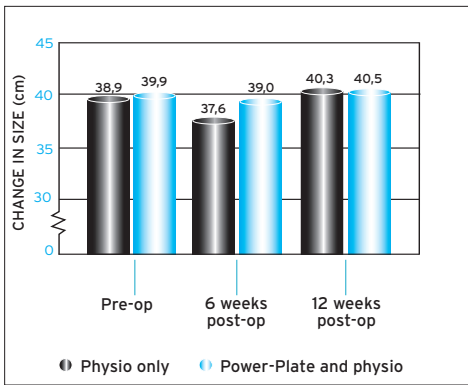


Fig. 2: Circumference

No significant differences were expected in the circumference of the calves, as the exercises on the vibrating platform were designed to target the muscles of the upper leg. No specific calves exercises were performed.

Circumference

As can be seen from **fig. 2** the upperleg did not reduce in size after surgery for the Power-Plate group in contrary to the physio group.

No significant differences were expected in the circumference of the calves, as the exercises on the vibrating platform were designed to target the muscles of the upper leg. No specific calves exercises were performed.

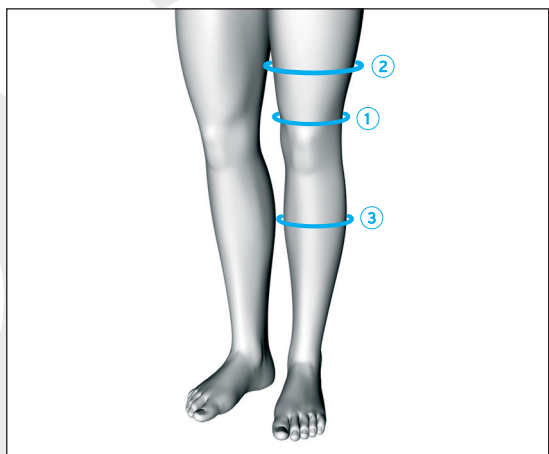


Fig. 1: Measurements of the leg circumference:

- 1 - 10 cm above the patella
- 2 - 20 cm above the patella
- 3 - 15 cm below the patella

Questionnaire

The following questions were asked before and after surgery and rehabilitation program:

- 1 How often does your knee feel painful?
- 2 Is your knee painful while sitting?
- 3 Doyouhaveproblemsstandingupandsittingdown?
- 4 Do you have problems walking down stairs?
- 5 How would you judge your general health?

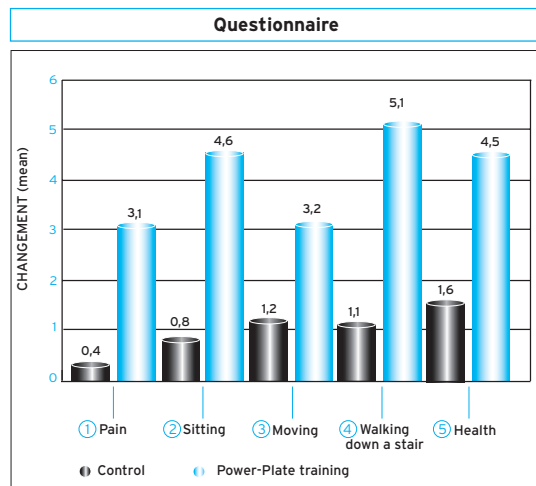


Fig. 3: Questionnaire

In this case, improvement is greater when there is more difference between initial and final data.

The rupture of the ACL generally leads to atrophy of the femoral muscular, coordinative dysfunction and a decrease in mobility of the affected knee. Training by using Power-Plate can lead to an accelerated increase of muscle thickness, recovery of the coordinative abilities and improvement of the muscular flexibility. As a result, this special kind of therapy can be used for stabilizing joints and preventing additional trauma. Power-Plate therapy is significant for anyone wanting to recover as quickly as possible from this kind of surgery in order to get back to normal daily activities such as work and sports.