

Rehabilitation after ACL-Reconstruction with the Active CPM CAMO[®]PED



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Problem

It is well known that injuries of the cruciate ligaments in the knee lead both to mechanical and functional deficits. Surgical transplantation, using mostly the body's own tendons, is the method of choice to re-establish mechanical stability. To overcome functional deficits, a coordinative-functional approach to training will be applied in order to increase sensorimotor skills.

To do this, various concepts for physiotherapy exercises have been developed that involve proprioceptive neuromuscular training and early-functional exercises.

The CAMOPED Active CPM has been developed addressing these issues. Using the CAMOPED, the patient moves the operated leg with the help of the non-injured extremity. As a result, the active involvement of the operated leg and the mobility of the operated knee are increased and early-functional, coordinative training of the injured leg can be achieved.

Question

Can the loss of coordination skills, proprioception, etc. be reduced by the use of an Active CPM?

Can atrophy of the joint-stabilizing muscles be reduced by the use of an Active CPM?



Material and Methods

Prospectively randomised study

Test Subjects

Twenty-five (25) patients in the CAMOPED group AM (18m, 7f) and 25 patients in the control group K (19m, 6f) with an average age of 35.0 years (AM=34.7; K=35.3)

Operative method: ACL transplant with Semitendinosus and Gracilis tendon; each surgery was performed by the same physician (Prof. H. Pässler)

Identical post-operative protocol for both groups (accelerated rehabilitation)

Test Method

One-leg-hop Test

Isokinetic Strength Measurement

Coordination Test, standardised (K.A.T. 2000)

Examination Times

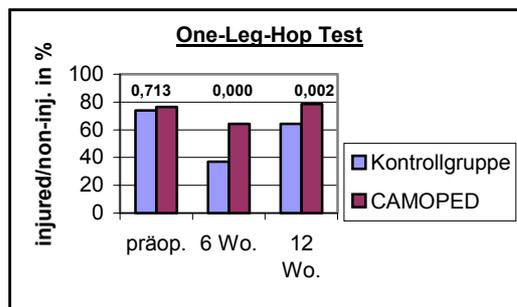
One day pre-operative

6 weeks post-operative

12 weeks post-operative

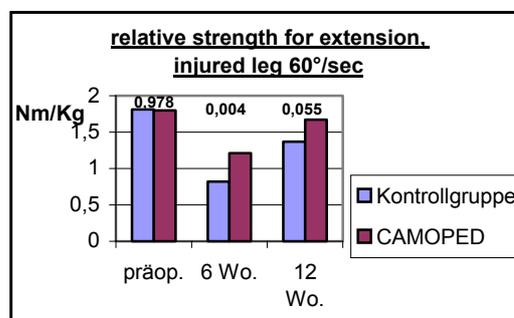
Results

One-Leg-Hop Test



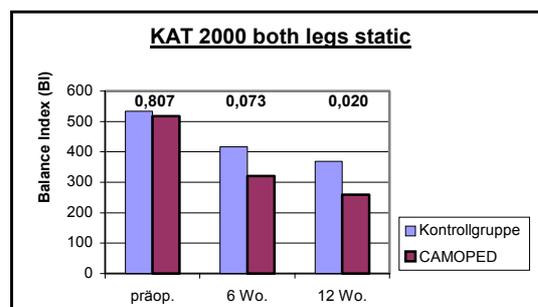
The AM group achieved significantly better results 6 and 12 weeks post-operative, but the difference in the two groups is more obvious at the time of the first post-operative examination.

Isokinetic Strength Test



The loss of strength among the group that used CAMOPED is significantly less at the first post-operative examination. This produced better results in the "One-Leg Hop Test".

Coordination Test (Balance Index)



Balancing on an unstable surface requires a high sense of stability in the injured leg, as does a jump. The control group did not perform as well at both 6 and 12 weeks post-operative.

Summary

After 4 weeks use of the CAMO[®]PED Active CPM, a clear performance advantage could be seen in the functional tests for this group. The tests executed bear a close relation to normal daily activities.

Possible reasons for this are seen in:

- A reduction of the neural inhibition of the extender mechanism,
- A contra-lateral transfer of muscle activation (cross adaptation).

The CAMO[®]PED Active CPM appears to be a beneficial addition to the standard rehabilitation program after ACL reconstruction.

It can be concluded that the CAMO[®]PED Active CPM can also be a valuable support with other indications, such as knee replacements, cartilage repairs, etc.