

DEEP OSCILLATION, KINESIO TAPING AND EXERCISES FOR AMATEUR FOOTBALL PLAYERS AFTER ACL RECONSTRUCTION

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INTRODUCTION

Pain, limited movement, and swelling are some of the most common problems after arthroscopic reconstructive surgery of the Anterior Cruciate Ligament (ACL) of the knee. In our medical center we have prolonged experience based on our work with amateur football players from the Russe region, Bulgaria. There we have experimented to combine the benefits of physical therapy with those of medical rehabilitation. Best results in overcoming the pain, reducing the swelling of the cruciate ligament of the knee and increasing the movement, we have achieved with a group of footballers where the protocol for post-operative physiotherapy was simultaneously applied with Kinesio Taping Method and Deep Oscillation.



METHODS

From January till November 2014 we worked with 45 amateur male football players, aged between 15 and 44 yrs, injured to the knee while playing football. All of them had ACL reconstruction using Bone-Tendon-Bone (BTB) technique or Semitendinosus-Gracilis (ST) transplant, with partial meniscectomy. The follow-up period of the patients was from day 12 till day 25 after surgery (2 weeks: 14 days). We have examined all the patients on the first and the last day of the study to be able to report the differences that had occurred in three different groups.

The swelling of the knee joint was measured on the level of the joint space, in centimeters.

Using the Visual Analogue Scale (0-10) the footballers were able to subjectively determine the pain level during movement.

Using SFTR methodology (2), we determined the Range Of Motion (ROM) of the patients by keeping within the maximal degrees of flexion in the knee joint prescribed for the given period, in respect of the surgeon's rehabilitation protocol.

Players were randomly divided into three groups according to their treatment:

Group A: standard physiotherapy (PT).

Group B: standard physiotherapy + Kinesio Taping (KT), daily application with Kinesio Taping Method (14 days KT).

Group C: standard physiotherapy + Kinesio Taping + Deep Oscillation (DO), interchanging one day DO, next day KT (total: 7 procedures DO, 7 procedures KT for the whole period).

Deep Oscillation (Photo 3) (Device: Deep Oscillation Personal, Physiomed, Germany) is characterized by an intermittent electrostatic field having positive effects on edema, pain, inflammation, and trophic state of the tissue (1). (Photo 4) It is effective, easy to apply and patients consistently perceive it as positive: we used to choose the program distorsio of ligaments for Group C every other day. (Photo 1)

Parameters: 5 min 120-180 Hz; 5 min 14-30 Hz; 5 min 85 Hz.

Kinesio Taping was applied daily to the patients of group B and every second day for those of group C. We were using "I" and "U" applications at 60-70 % tension. We used the KT as a dynamic splint, and also because of its pain and swelling reducing properties.

Kinesio Taping is a methodology that affects the trigger endogenous analgetic system. By using KT it is possible to control the pain and the disbalance of the cervico-thoracic area. Same effect is expected when the method is applied in the area of the knee (3). (Photo 2)



Devices

Photo 3

Physical Principles

Johnson-Rahbeck effect

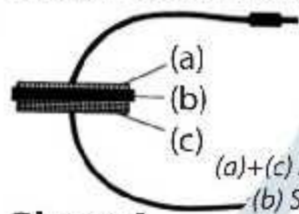


Photo 4

Deep oscilationis :

- Based on electrostatic field
- Attraction and release in frequency chosen
- Rhythmic deformation in depth of tissue
- No comparison to ultrasound or shockwave

Treatment methodology included physical therapy interventions (4):

- instruction (surgery, complications, rehabilitation program, exercises).
- bracing; Every patient was trained to do the right movements in their every day routine, and to avoid doing wrong movements.
- cryotherapy; joint mobility training (active, active assisted and resisted).
- strength training (isometric, isotonic, isokinetic; concentric, eccentric; open kinetic chain, closed kinetic chain).
- gait re-education.
- training of neuromuscular function, balance and proprioception. (Photo 5)



RESULTS

From our results we have established positive normodynamics. We believe this to be due to the purposeful methods of treatment.

Comparing the three indicators we have established that lowest final results were achieved during the treatment of Group A. Most significant changes were monitored in the results of Group C.

VAS and edema (P>0.05) were the variables that showed statistically significant difference (Figure 2, Figure 3). The changes monitored in ROM for all three groups were not significant (P<0.05) (Figure 1).

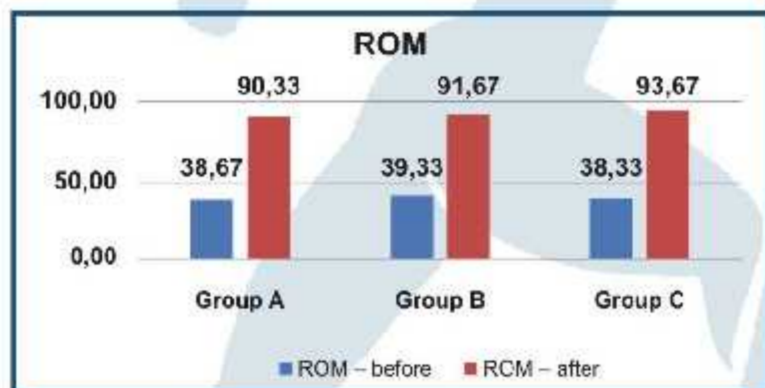


Figure 1: Range Of Motion (ROM) measured at baseline 12 days after surgery (before) and after two weeks (after).

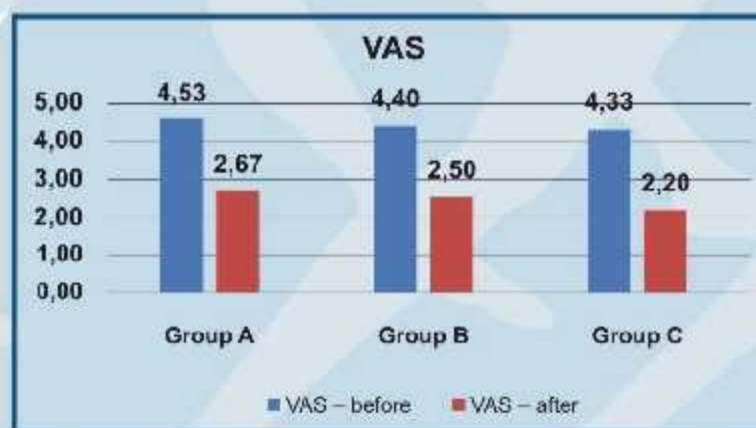


Figure 2: Visual Analogue Scale (VAS) measured at baseline 12 days after surgery (before) and after two weeks (after).

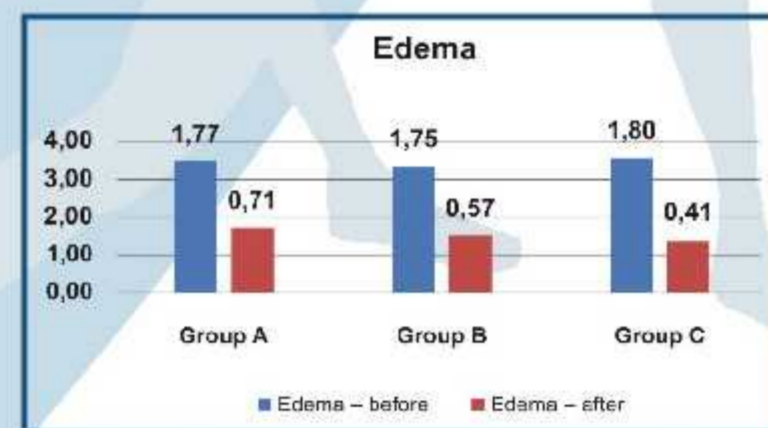


Figure 3: Edema measured at baseline 12 days after surgery (before) and after two weeks (after).

CONCLUSION

By combining exercises with Deep Oscillation treatment and the Kinesio Taping Method we can improve the results in the post-operative period after reconstructive surgery of the ACL of the knee in football players. The methods could be put into practice in order to improve the recovery results among the sportsmen, so they could return to their sports activities and active training in a short period of time.

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