

## THE POST TRAUMATIC RECOVERY OF ACHILLES TENDON FOR A PERFORMER ATHLETE

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**Keywords:** athlete, recovery, Achilles tendon

**Summary:** Getting great performance requires the athlete body a large amount of effort, that can lead to 'wear and tear' the body with irreversible damage to health, if not the whole process of sports training is conducted by proven scientific principles.

### **Introduction**

Practicing myself athletic performance, and then training athletes, I encountered various problems with the production of trauma that can disrupt or diminish the opportunity to practice this sport. Accidents suffered by athletes diminish training efficiency and effectiveness of less effort; minimize the possibility of an athlete to obtain performance, leading to failure goals.

Studies regarding the incidence and exposure to injuries and mechanisms of injuries, it shows that three quarters of all accidents are probably avoidable. Therefore kinesiology with specific means, intends to prevent injuries and control where these relapses occurred already.

Terminal segment of the leg is the ankle with the foot, its functions (static and dynamic) being adapted, there is an amazing architectural structural complex. This complex is damaged in the event of a partial or total rupture in the Achilles tendon.

Regarding this subject, I tried to find ways and means by which the therapist has to restore the joint functionality, diminished or lost due to Achilles tendon rupture.

Local kinetic recovery action is performed after surgery, orthopedic and physiotherapy, all of strengthening and increasing the efficiency of applied physical therapies programs.

Hypotheses are proposed for demonstration:

- To what extent the therapies programs provided the treatment and optimization of the results and removal of dysfunction of the lower leg;

- If the means and methods selected and applied will improve the clinical symptoms;

Aim of this theme, is to check the basic assumptions made, to improve the recovery process, to reduce the recovery time and increase its efficiency.

Research took place at the Kinesiology and Swimming Department of the Faculty of Physical Education and Sport on the subject of an athlete, with post-traumatic rupture of Achilles tendon. He appeared to recover ever since the period of immobilization, having kinesiology treatment from the beginning days after surgery.

The subject was taken over on 15.1.2010 when presented for recovery after surgery on the Achilles tendon. In a physical training program, following sudden movements due to overloading, the Achilles tendon rupture occurred at a rate of about 85% which required surgery.

Physiotherapy in treatment of this patient following local changes:

- moderate pain in the ankle joint and leg;
- ankle joint swelling and plantar fasciitis;
- bursitis( of the bursa located on the back of the calcaneus bone);
- the foot in plantar flexion position;

Conducting the experiment itself

**General goals:**

- pain relief;
- restoration of joint mobility;
- restoring force, stability and ability;
- improving emotional status;
- improvement in exercise performance;
- no social and professional stress

**The first remedial step** is carried out, being immobilized. Period of immobilization was 4 weeks with plaster splint, by setting the foot in equine position to help heal the scar place.



**Fig.nr.1. Immobilization in plaster splint**

*Physical therapy program for Phase I*

During this period, the following goals are:

- A. Ensure venous-lymphatic drainage (avoiding edema).
- B. Maintaining muscle tone in healthy member and for the affected one, increased muscle tone in the thigh.
- C. Maintaining a good functionality of the entire body.

**Means:**

Venous-lymphatic drainage to ensure it is used:

- counter-declination positions of the ankle and the foot, Buerger – type exercises and vascular gymnastics, manual lymphatic drainage; above and below the scar - stimulating massage;

Abdominal breathing exercise (diaphragmatic breathing).

- Gymnastics for functions activation (digestive, circulatory and respiratory)

To maintain healthy muscle tone on member use:

- isometric contractions of quadriceps (300-600 daily)  
Mobilization of the leg on the thigh in the first week at an angle bigger or equal with 90°. The second week is mobilized from 90-60 ° and the third week of 60-30 °.
- Active mobilization of the thigh on the pelvis.
- Active and passive mobilization of the fingers.
- Active mobilization, active resistance to all open joints;
- Active mobilization and active resistance to the upper limbs and to latissimus dorsi muscle, for walking assistance.

In the fourth week the splint is taken out, the foot is repositioned at 90 ° angle to the shank, then the splint is adapted at this position. Movement is done on two crutches without support on the affected leg.

**Physical therapy program after immobilization  
Stage II (after immobilization)**



Scar Fig.nr.2 The scar of the Achilles tendon, patient: AI

**GOALS:**

- A. Fighting edema.
- B. Pain relief.
- C. Fighting retractions contractures and muscle.
- D. Maintaining muscle tone.

**Means, methods and principles:**

- positioning, using plantar devices;
  - A. Using the orthotics a heel support device for four weeks.
  - B. The seventh week begins walking with heel support on the affected foot, 4cm high.
  - C. The eighth week the heel support will be minimized to 3 cm.
  - D. The ninth week the heel support will be adjusted to 2 cm.
- It is prohibited one foot support.

From the tenth week will be walking with one crutch and the height is 1 cm for the heel device.

- Wearing an elastic bandage for the foot and ankle.
  - Hydro-kinesiology without loading on the affected limb. General movements for the lower limb and analytical movements of up to 90 ° at the ankle;
  - Leg massage by known processes associated with Cyriax technique for painful tendons and ligaments;
  - B rger type exercises performing;
- Electrotherapy: electro stimulation and ultrasound;
- Passive mobilization of ankle and foot;
  - Mobilization of the knee: from the tenth week full extension is achieved;

- Active mobilization and active resistance of the knee and thigh
- Neuroproprioceptive facilitation techniques (IR, IL, ILO).

**Treatments:**

Treatments were designed as follows:

- Hydro-kinesiology-fifteen minutes
- Leg massage technique associated with Cyriax technique for painful tendons and ligaments - 10 minutes;
- Cryotherapy applications as ice massage - 5 .. 10 minutes in the acute phase;
- Electro stimulation of the calf muscles five minutes;
- Ultrasound with NSAIDs 5 ... 8 minutes sub acute phase;
- Passive-active movements of the affected segment - 10 minutes;
- Active movements performed simultaneously for mutual induction - 5 minutes (it will do 10 repetitions for each exercise);
- Neuroproprioceptive facilitation technique - 5 .. 10 minutes.



**Fig.nr.3. Electro stimulation of the calf muscles.**

To remove edema and ensure lymphatic drainage was recommended for implementation venous-lymphatic Burger exercises at home, that is accomplished three times per day.

Recovery of post-traumatic Achilles tendon, will continue with phase III (after 75 days).

In a conclusion of this study, analyzing the results obtained during the experiment can be stated:

**All hypotheses were tested:**

- Applying the kinesiology treatment programs we optimize results and eliminate dysfunctions of the lower limb;

- Means and kinesiology selected procedures and their applications will improve clinical symptoms;
- To achieve an effective functional rehabilitation treatment was necessary to deal with all possibilities of modern therapy available, realizing the so-called recovery is multifunctional;
- Training topic early in the rehabilitation program objectives and effects of exercise on the body, forming strong motivations led to the optimization of treatment through awareness and active participation;
- Therapeutical means used during the rehabilitation program should be selected according to the phase of treatment goals and patient feedback on their application;
- Treatment sessions must have a permanent rehabilitation nature for diminished functions in the affected area by traumatism, and that will assure full reintegration in sport of the athlete.

### References

1. Baciu C., "Musculoskeletal apparatus" Medical Publishing, Bucharest, 1981
2. Carligelu V. Duma E., Simu Z., "Physical culture and naturopathy" Ed UTCM Cluj - Napoca, 1997;
3. Cataniciu V., "Kinesiology and a healing art of movement" Ed Todescu, Cluj - Napoca, 2001;
4. Carligelu V., "Kinesiology an art of movement and healing" Ed Todescu, Cluj-Napoca, 2001;
5. Cordun Mariana "Medical Kinesiology, Ed axis, Bucharest, 1999;
6. Dragan I, "Applied Sports Medicine, Ed. Editis, Bucharest, 1994;
7. Dumitru D., "Guide of functional recovery", Sports Tourism Bucharest Ed 1981;
8. Gagea A."Interdisciplinary research in sport performance", Ed Ministry of Internal Affairs and Administrative Reform, Bucharest, 2007;
9. Gorun N., Voinea A., L.Vesei L. and Tiroi C., "Orthopedics and Traumatology" Scientific and Encyclopedic Publishing House, Bucharest, 1987;
10. Pop L. "Course of balneology-physiotherapy and rehabilitation;
11. S Benghe T., " Prophylactic therapeutic kinesiology and rehabilitation", Medical Publishing House, Bucharest 1987;
12. S Benghe T., "Medical recovery of post- traumatic limbs", Medical Publishing House, Bucharest, 1981;

13. Stroescu I. Negoiescu M., "Functional Recovery in rheumatologic practice. Progress in functional diagnosis. Medical-surgical methods and techniques, "Medical Publishing, 1979;
14. Poenaru, V. Petrescu, P Buse, I Raibulet T, "Trauma and functional recovery in athletes", Ed. Facla, Timisoara, 1985;
15. Radovic I, San-Marin Helen 'Recovery traumatized athletes' Stadium Ed, 1973;
16. Mark V., "Massage and physical therapy, Ed. Sports Desk, Bucharest, 1983;
17. Mark V Child Carmen, "Massage and complementary techniques, Oradea, 1995;
18. Robanescu L. Mertoiu M., "Some reflections on sural triceps function", Romanian Physical Therapy Journal, 1996;
19. Rinderu E., 'Kinetic intervention in neuro-mio-artrokinetic system disorders', Ed Universitaria, Craiova, 2007;

**Titlu:** Recuperarea post-traumatică a tendonului achilian la un atlet de performanță.

**Cuvinte cheie:** atlet, recuperare, tendon Achilian

**Rezumat:** Obținerea marilor performanțe necesită din partea organismului sportivului eforturi deosebit de mari care pot duce la uzura organismului cu deteriorarea ireversibilă a stării de sănătate dacă întreg procesul de pregătire sportivă nu se desfășoară după principii științifice verificate.

**Titre:** La mission de récupération traumatique du tendon d'Achille pour un athlète performeur.

**Mots-clés:** sportif, la récupération, du tendon d'Achille.

**Résumé:** Mise en excellente performance exige que l'organisme sportif une grande quantité d'effort, qui peut conduire à «l'usure» du corps des dommages irréversibles à la santé, sinon l'ensemble du processus de la formation sportive est menée par des principes scientifiques éprouvées.