

BRACHIAL BICEPS RUPTURE RECOVERY IN ATHLETES

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Keywords: muscle rupture, recovery.

Abstract

After a brachial biceps rupture, the affected limb will be unavailable until the recovery, handicap that have a big influence not only to the evolution as a individual but also the maintaining of an optimum level of life.

The recovery of the muscle ruptures is quite complex and implies a lot of stages. It begins with the immobilization of the segment immediately after the accident happens. Continuos with the removal of the pain that appears inevitably and the fight with the inflammation. After that, by various kinetic techniques we fallow the muscle modeling, keeping the joint mobility, the muscle toning and the propioceptive reeducation.

Introduction

“How quickly and easily a sport career can end and how easy can go down the drain hundreds of training sessions, thousands of hours spent in the gym and hopes of each athlete who wants to reach the top of bodybuilding. A faulty heating, a moment of inadvertently and our bodybuilder arrives to the point that people say: “he could have been great if he hadn`t had bad luck, or in a better case he had to stay away till his organism restores. Muscle injuries are defined as macro - trumas with internal origin, created by a sudden muscle contraction in favorable situations.

Taking as sample practitioners of all kind of sport, the most common place for the muscle injuries is the lower extremity muscles, precisely on the quadriceps and the leg adductors and even if the muscle rupture of the brachial biceps is not on the high position, this muscle

rupture represents a trauma with serious repercussions because of the great importance of the upper extremity.

These types of accidents do not occur only to athletes. Lately, the preoccupation of the self image has increased in detriment of the main objective of exercise that is the health. Thus body building and fitness gyms have multiplied and are populated by people who call themselves “athletes” but they do not have the slightest knowing of what athletic performance or athletic amateur means. This sport that uses the exercises with weights has grown and gathered more and more followers, who do not respect at least the basic principles of a training and who do not have a proper nutrition and a period for rest, so the organism can restore. They always hit the weights in a chaotic way focusing only on getting a balanced body forgetting of the old axiom underlying the human being, namely “Mens sana in corpore sano”.

Their organisms are young and it has a great capacity of adaptation and by chance it does occur nothing, but some day the inevitable accident will happen. Why leave it all to chance? Why not paying more attention to pre - training preparation?

The frequency that this affection (condition) appears by gender, it is clearly in detriment of men and that even if women have less developed muscles, this fact is due to occupational factors and the fact that sports that require handling large loads or the contact sports are practiced predominantly by men.

By its surface the injury can be:

- fiber injury, when only some fibers are injured;
- fascia injury, when some fascicules are injured;
- fiber – fascia, when 1-2 fascicules together are injured;
- Total injury, when a part of the muscle frame or all the muscle is injured and the athlete must be quickly transported to hospital and undergone surgery.

By location, the biceps brachial rupture can be:

- Proximal;
- Distal.

The Highest frequency is the proximal brachial biceps rupture, namely 90-97%, while the distal is 3%.

Materials and methods used in the assessment and recovery of brachial biceps

Research methods used:

Method (greek word *methodos*) = way, path, way of research, knowledge and transformation of objective reality.

Observation method (objective examination)

Observation is the oldest way of knowledge. By activation, awareness, reasoning and organisation of the observation, this method becomes a scientific method of investigation which runs from direct contact with reality

Observation is a method of ascertaining and exploration carefully those observed by mobilization of previous information.

From observation it appears assumptions, classifications, descriptions, and the new problems that we have to take into account in the recovery process.

Experimental method

The experimental method is a complex system of knowledge of reality, characterized by the use of experimental reasoning, processing facts from observation and from experiment.

Survey method

Survey methods are auxiliary to the complex research complementing the data obtained by the other methods and techniques. In particular it pursues to study opinions, reasons, attitudes and habits and manners to make decisions and acts of individuals or specific groups. Whether they are used independently or in conjunction with other methods, survey methods must be used with strict methodological requirements. Otherwise, the conclusions will be more subject to subjectivity of the persons interviewed and therefore the researcher (subjectivity), and a very high coefficient of error coming from multiple other causes.

The investigation is one that offers information, evidence from various sources, but the experiment provides us with “evidences”.

Materials:

To achieve tests

- Metric tape
- Goniometer
- Scale
- Dynamometer
- Chronometer

To achieve the kinetic program:

- Seat, table
- Ball, hand flexor curl (wrist curl)
- Weights 0,5 kg and 1kg
- Metal disc weights 0,5 and 1kg
- Metal bar 120 cm, 1,7 lg
- Dumbbell handle 1,7 kg

Machine pulley

Work hypothesis

The hypothesis is an assumption, an anticipation of relations or results to be verified. The hypothesis properly formulated results from a certain level of knowledge, its appearance occurring in confrontation between particular practice, specifically determined and an existing theory.

From the research work it results the following assumptions:

- if through kinetic methods the joint mobility of the affected segment increases and it remains so;
- if the kinetic methods applied lead to increase muscle strength of biceps.

General objectives

1. Recovery of the normal functions of the upper limb;
2. Increase and maintain joint mobility of upper limb at an optimal level;
3. Increasing muscle strength as closely level as it was before the accident;
4. Return of the patient to sports life.

Recovery Organization

Recovery was achieved over a period of approximately two months up to date, with two or three weekly meetings of one hour.

Initial location was the physical therapy room at the Faculty of Physical Education and Sports, University „Stefan cel Mare” Suceava and then the exercises were done inside a fitness facility.

At the beginning of each meeting it had had a centripetal massage to improve the troficity in the affected area thus speeding up the recovery. After this it was created a very well structured exercise program setting gradually and progressive the difficulty and weigh. Every step on this program must prepare the affected muscle for what had to come.

Data processing

Kinetic evaluation sheet

Date: 01.03.2011

Name: P

Surname: V

Age: 26 yaers

Sex: Male

Height: 175 cm

Diagnosis: Posttraumatic rupture distal extremity of the right biceps brachial in proportion of 75% operated.

Historical: accident a month ago by falling on the right upper limb, operated on 31.01.2011, removing wires after 14 days.

Medical and surgical treatment: incision, distal extremity primary tenorrhaphy right biceps, haemostasis, suction aspiration, suture, dressing, immobilization.

Types of exercises from the physiotherapy program (schedule) applied:

Nr.	Position	Action	Nr. Reps	Observations
1.	Sitting on a chair with arms supported on a table surface	Isometric contractions of the biceps by holding a ball or a circle flexor	10 reps of 6 seconds each with breaks of 12 second between	
2.	Siting on a chair with forearm support on the edge of the table, fist outside	Hand flexion and extension to forearm and the with light weights	2 s x 10 reps	Forearm should be well supported on the table surface without allowing the elbows to raise.
3.	Sitting on the chair or in orthostatism	Passive mobilization, passive-active mabilization, active-passive and the active mobilization elbow and shoulder joints	10 reps for each motion	All possible motions must be made without pain. Motion must be done gradually until it reaches a maximum degree of mobility
4.	In orthostatism	Hold-Relax contractions by slight resistence applied by the physiotherapist	10 reps with breaks Double contraction	The patient must execute the commands given by the physiotherapist
5.	In orthostatism	Alternating isometric by slight resistence applied by the physioterapist	10 reps	The patient must execute the commands given by the physiotherapist
6.	In orthostatism	Strengthening sequentially	10 reps	

7.	In orthostatism	Forearm flexion on the arm with stick	2 series x 5 reps	
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Fitness testing (Ruffier Test)

Named by the author “test for assessing fitness” is based on variation in resting heart rate (sitting), after exercise (30 squats in 45s) and back (sitting). Measure heart rate at rest is 15s (sitting) - P1, then measure heart rate exercise still sitting 15s after exercise - P2, and in the first minute after exercise, the seconds 45-60, still sitting - P3. Values are multiplied by 4 to have the heart rate per minute. Use the formula: $R = ((P1 + P2 + P3) - 200) / 10$. The interpretation is as follows: very good=negative result, good=0-5, medium=5-10, satisfactory=10-15, unsatisfactory=15.

Tabel 1. The values of the parameters tested: Ruffier Test

Test date	Body weigh	P1	P2	P3	R
01.03.2001	103	78	112	92	8,2
23.03.2011	97	76	104	88	6,8
20.04.2011	96	76	104	84	6,4

Following Ruffier Test it can be seen an improvement in the general physical condition, physical condition altered during post-surgery immobilization, and a weight loss.

Tabel 2. The values of the parameters tested: Testing pain

Test type	Valuation date		
	01.03.2011	23.03.2011	20.04.2011
Spontaneous pain			
At rest	-	-	-
Personal hygiene	+	-	-
Daily activities	+	-	-
Sports	+	+	-

Tabel 3. The values of the parameters tested: arm circumference

Test type	Valuation date					
	01.03.2011		23.03.2011		20.04.2011	
Measures in cm	Right	Left	Right	Left	Right	Left
Relaxed arm	34,5	38	39	40	39,5	41

Arm in contraction	38,5	40	39,5	41	41	42
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According to the table above, we obtained a recovery in volume of the affected biceps quite close to that of the healthy one. This was possible because of toning and thanks to a trophic improvement that helped to faster recovery.

Tabel 4. The values of the parameters tested: Force balance

Test type	Valuation date					
	01.03.2011		23.03.2011		20.04.2011	
Muscle balance (right biceps brachial)	2-		3+		4-	
Dynamometry	Right	Left	Right	Left	Right	Left
	38	75	83	87	85	90

According to the scale of 0 to 5 introduced by the “Medical Research Comicii” and adopted in 1995 by “National Foundation for Infantile Paralysis” we can see a significant improvement from initial testing on 01/03/2011, at which moment the affected biceps could execute very light actions without resisting to the gravity and, till the last test at which moment the biceps can execute movements not only against the gravity, but even work with slight weights.

In terms of joint mobility, the patient had a pretty good condition. This fact was possible because of using an orthosis made in that manner that the elbow could execute extension motions, and the flexion movement was taken over by an infant elastic.

Conclusions and proposals

Following application recovery program we obtained both aesthetic and functional results. Thus there was a significant development in terms of patient force. Today patient is able to perform normal daily activities.

In addition to kinetic resources, the massage had an important role improving circulation and the trophicity in the affected area thus speeding the recovery.

As for returning to sports life, I propose that recovery program to continue until reaching the desired results, and to take into account the important aspects of training for such injuries may not occur again.

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Titlu: Recuperarea rupturii de biceps brahial la sportivi.

Cuvinte cheie: *ruptura musculară, recuperare.*

Rezumat: În urma unei rupturi de biceps brahial, membrul afectat va fi indisponibil până la refacere, handicap ce influențează extrem de mult nu numai evoluția ca individ dar și menținerea unui nivel optim de viață.

Recuperarea rupturilor musculare este destul de complexă și presupune mai multe etape. Acesta începe cu imobilizarea segmentului imediat după producerea accidentului. Continuă cu eliminarea durerii ce apare inevitabil și combaterea inflamației. Mai apoi prin diferite tehnici kinetice se urmărește modelajul muscular, păstrarea mobilității articulare, tonifierea musculară și reeducarea proprioceptivă.

Titre: La récupération des ruptures musculaires du biceps brachial aux sportifs.

Mots-clés: *rupture musculaire, la récupération.*

Résumé: Suite à une rupture du biceps brachial, le membre affecté sera indisponible jusqu'à la récupération, handicap qui influencer beaucoup l'évolution non seulement en tant qu'individu, mais aussi de maintenir un niveau de vie optimale.

La récupération des ruptures musculaires est assez complexe et implique plusieurs étapes. Il commence par immobiliser le segment

immédiatement après l'accident. Il continue avec l'élimination de la douleur qui continue semble inévitable et combattre l'inflammation. Puis, à travers différentes techniques cinétique vise à la modélisation musculaire, préservant la mobilité des articulations, le tonus musculaire et rééducation proprioceptive.