



Training flexibility in young tennis players.

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ABSTRACT

Flexibility training is crucial in tennis. Many lower limb injuries in young players occur due to poor flexibility. The present article stresses the importance of flexibility training in young tennis players, in order to create a professional habit that will bring about benefits and will help to prevent injuries at later stages.

Key words: Training, Injury, Elasticity, Joint mobility.

Received: 25 October 2010

Accepted: 28 November 2010

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INTRODUCTION

During tennis training, both active and passive flexibility have to be trained (Ortiz, 2004). Both residual and submaximal flexibility are key to the amplitude of movement and to avoid injuries (Ortiz, 2004). Absolute flexibility is the maximum stretching capacity or the mobility range of a joint. Few sports require absolute flexibility development (gym, synchronized swimming, figure skating) and tennis is not among them. Residual flexibility is the optimal flexibility level, which, not being the maximum, goes beyond working flexibility. Residual flexibility is key for tennis, since it is essential to prevent injuries and to help perfect performance in tennis without any constraints to the amplitude of movement (for example, the high demand on the scapula-humerus belt on the serve). Finally, working flexibility, is the desired level for the production of an ample, free flowing and efficient movement. It is determined by technique and requires not only a stretching capacity of the muscle, but also requires appropriate elasticity of the ligament- muscle unit for a powerful and fast movement. Working flexibility, together with residual flexibility are of utmost importance for tennis players (Ortiz, 2004; Blandon 2004).

FLEXIBILITY CONCEPT

Flexibility is a term that is easily mistaken and is even considered as a synonym of elasticity or joint mobility, which can lead to misunderstanding in the literature (Ortiz, 2004).

The present research seeks to clarify the definitions of flexibility with a short review of the literature and of terminology related to flexibility Ortiz (2004), suggests that in tennis:

-Flexibility means sliding with an ample separation of the legs; residual and submaximal flexibility being fundamental both for

the amplitude of movement and to prevent and avoid possible injuries.

-Elasticity can be defined as recovering the neutral position after hitting when trying to return a ball. In this action, muscle and ligament elasticity and contraction capacity are key towards a dynamic and fast recovery to return to the hitting position.

-Joint mobility is the stretching capacity of the joints (flexibility) and fast recovery (elasticity).

In light of these definitions, Ortiz (2004) considers that when sports require fast and explosive actions with great amplitude of movements like in tennis, it is necessary to achieve a joint development of flexibility and elasticity, the combination of which is the factor that provides high levels of mobility (displacement and return) to a joint.

Training evolution and methodology

The inverse development of flexibility as we grow older is widely known (Alter, 1998; Delgado et al, 1997; Vila, 1999; Ruiz Pérez, 2004), and is the only physiological capacity that shows regression as physical development progresses. The main objective when training flexibility is not just improving it but reducing its loss to a minimum. Maximum flexibility happens a few months after birth, and it begins to weaken towards puberty. During childhood, the development of flexibility is similar in boys and girls. Up to the age of 10-11 flexibility loss is minimal, being greater between puberty and 20-30 years of age, after 30 it becomes stable again and then it starts gradually decreasing depending on the training level of the individual.

Research suggests that children are most receptive to flexibility training between 6 and 10 years of age, and that work in this capacity should be practiced between two and five days a week at this time. Blanco (1995) considers that static flexibility can be trained from the first years in life, given the little muscular mass and elasticity of the sinews until puberty. However, for dynamic flexibility training, he suggests waiting until 8 to 11/12 with girls and 8 to 12/13 with boys since a certain level of strength and coordination development is necessary. Vila (1999) in his evolution of flexibility analysis at different ages considers childhood as a time for a significant joint mobility growth; while many authors consider maximum development at puberty. At school starting age (6 years), the flexibility of children remains intact, but whilst muscles and bodies are growing, flexibility will inevitably start deteriorating. Therefore flexibility should be specifically trained so that this loss becomes more gradual in spite of the development of the muscular mass (strength increases tends to shorten the contractile components of the muscular cells). Vila (1999) suggests the following methodology:

- Up to the age of 10, general mobility training.
- Mobility is at its peak up to 10 years of age. Specific training is required to maintain it.
- Flexibility at the junior level does not have to be developed to maximum capacity, since other mobility components can harmfully or negatively be impacted in the long term.
- The development of flexibility/mobility is not the same in the different joint systems.
- Training should be appropriate to age.
- At early ages, mobility must be active, and towards adolescence when competition begins, exercises must be passive and static.
- Excess mobility is harmful for the muscles, so, it must be strengthened often at the expense of flexibility.

There exist many equally valid protocols for flexibility training in young tennis players, we suggest the use of the protocol for tennis designed by Anderson (1984) (Figure 1). We consider that it is important, at development ages, to set a protocol so that the athlete gets familiar with his task, finds it easy to remember and in order to create a positive habit in the player for later life.

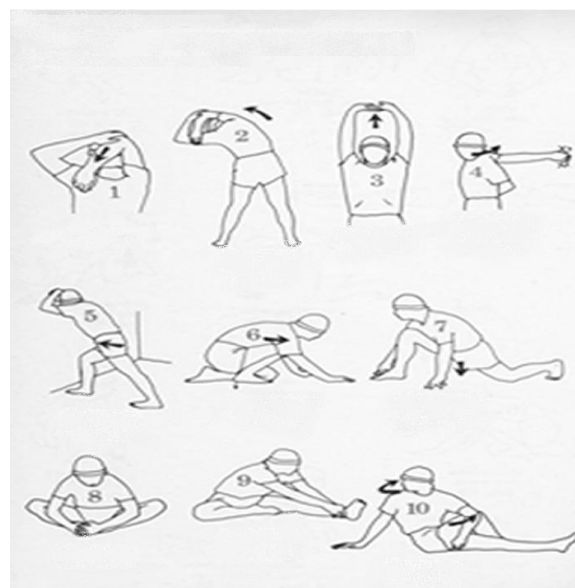


Figure 1. Protocol for tennis stretching (from Anderson, 1984).

CONSEQUENCES OF POOR FLEXIBILITY

Many authors (USTA, 2000; Le Deuff, 2003; Ortiz, 2004; Kovacs et al. 2007) have provided information on flexibility in tennis players by means of different tests. On the basis of these findings we can compare and appreciate the flexibility of our tennis players, but what happens if tennis players' flexibility is low?

In spite of what we may initially think, it has been stated that more injuries occur in the lower limbs than in the upper limbs in tennis (Pluim et al. 2006). The great majority of these injuries that occur in the lower limbs are caused by the following (Riewald y Ellenbecker, 2005):

- Lack of flexibility of the hip flexors (positioned at the top of the thigh in front of the pelvis). These muscles are important, not only because they sustain the length of the stride but also because Vad et al. (2003) found that the restrictions in the flexibility of the hip go together with lumbar (lower back) pain.
- Lack of flexibility of the external rotators of the hip. The capacity to rotate the hips is important towards generating strength, in practically every stroke, and to connect the lower with the upper part of the body.
- Lack of flexibility of the ischiotibials/hamstrings and quadriceps. Their flexibility is needed to move effectively, to sustain the peak strength of the muscles during explosive movement, and to prevent injuries in the legs and the lumbar area.

Ortiz (2004) summarises all that has been mentioned previously when he explains how "[there are]those famous and painful

pelvic pains caused by increased muscular tensions and restriction of the kinetic muscular chain, which is made up of abdominals, adductors, and ischiotibials (hamstrings). This can result in tears and swellings of the tendons and ligaments that converge in the lower part of the iliac bone or pelvis". The difference in strength and flexibility existing in the lower limbs, between the extensors of the knee (quadriceps) and the flexors (ischiotibials), besides preventing optimal development of speed of displacement leads to those well known "sprains" or "twinks" as well as problems in the knee joint. In tennis, the player performs most movements half bent on his knees, greatly overstraining the quadriceps muscles, which leads towards a forceful displacement of the patella. In such case, the ischiotibials will have to perform the difficult task of stabilizing the knee, which is unstable and fragile when the person is in such position. The main cause of all problems of the patella and the ligaments of the knee is a poor imbalance of forces and flexibility of quadriceps/ischiotibials of the player's legs (Ortiz, 2004).



As Ruíz-Cotorro (1996) states, "stretching exercises and wearing insoles often solve most injuries of the lower limbs" that occur when playing tennis (plantar fascitis, injuries of the ligaments of the ankle, meniscal injuries or pathological problems of the patella, shortening of the ischiotibials...)

Busquets (1999), as cited by Ortiz (2004), makes up a long list of dangerous consequences derived from ischiotibials that have poor flexibility: ascension of the anteroposterior iliac spine, great extension of the front rectus, tendinitis of the knee and rotation of the knee with meniscal compression, lengthening of adductors, (contractures, tendinitis), lengthening of the larger sacrum sciatic ligament (sciatic pain), lumbar lordosis (lumbar sciatic pain), tensions of the lumbar square and the psoas, ending in pubic pain.



CONCLUSIONS

Flexibility has always been greatly overlooked during training sessions and is still overlooked by a majority of trainers and players alike. The aim of the present article is to underline how important flexibility and mobility training is towards preventing injuries and how necessary it is to include it when training young tennis players through to fully developed players. The present article believes that it is one of the basic pillars of training, and that solid programmes for tennis development should be centered on flexibility. Therefore, the acquisition of good sporting habits, such as the regular practice of stretching exercises is a strong recommendation.

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