

Application of Controlled Movement and Proprioceptive Challenge to Lower Body Stretching for Elite Tennis Players

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Injuries to the lower extremities in elite tennis players are prevalent due to the multidirectional movements inherent in tennis play coupled with the repetitive loading and often extreme ranges of motion incurred in some tennis strokes (Figure 1). Tennis is unique in that it is played on many surfaces with very different coefficient of friction and traction demanding different responses at the court/shoe interface affecting traction, lower body loading, and ultimately functional performance. An increase awareness of hip injuries in including femoroacetabular impingement and labral tears has necessitated clinical strategies aimed at reducing intra-articular hip injury. Descriptive study of hip internal and external rotation range of motion have shown bilateral symmetry in elite level tennis players. Additionally, tennis players and other multidirectional sport athletes have long been plagued with muscular injury in the form of strains particularly of the two joint musculotendinous structures of the hip and groin. Finally, recent emphasis has been placed on dynamic stretching and warm-up prior to athletic performance due to the finding of short



term decreases in acute high intensity muscular power and explosiveness following traditionally applied static stretches in athletes.

Clinical Application

Tennis specific stretching for the lower extremities and trunk has traditionally been comprised of a series of static stretches for the hamstrings, adductors, quads and lower back extensors with the purpose of both injury prevention and performance enhancement. The purpose of this article is to describe updated tennis specific stretches for the lower extremity in tennis players that use the Thera-band Stability Trainers as an adjunct to the dynamic method of imposing movement while the player is shortening and lengthening targeted muscle groups. Muscles emphasized are the two joint muscles of the hamstrings, groin, hip flexors and quadriceps all of which are under extreme length tension loading during high performance play. The basic premise of this dynamic stretching method is to place the target muscle in a position whereby short controlled movements will systematically shorten and lengthen the target muscle while the athlete is placed in a weight bearing functional position with the contralateral limb on a stability trainer to provide a challenge to the proprioceptive system of the body. Keys to the performance of this type of dynamic stretching would be to ensure that a controlled movement occurs toward

the end range of available motion and that progressive increases in motion can be added as the muscle tendon unit responds during subsequent repetitions of the activity. The dynamic portion of this controlled method of stretching is imparted by the physical

therapist through a series of movements which elongate and shorten the muscle while the player is in the functional positions pictured below in Figures 1-4. The addition of the Thera-Band® Stability Trainers adds to the difficulty of the exercise as the player must stabilize himself during the dynamic stretch and

maintain proper alignment of the trunk and upper extremities.

Tennis Specific Advancement / Progression

To advance each of the exercises, players can grab a racquet and perform groundstroke (forehand and backhand) movements during the stretching movements to further simulate the stresses on the joints and muscle tendon units during this type of applied stretching. Use of this type of stretching is meant to most closely simulate the demands and stresses of the two joint muscles to prepare them for both tennis training and competition.



Figure 3. Hamstring Stretch using Thera-Band® Stability Trainer



Figure 2a-b. Hip Adduction (Groin) Stretch using Thera-Band® Stability Trainer



Figure 4. Hip Flexor and Quadriceps Stretch using Thera-Band® Stability Trainer

Progression

Progression of these exercises as a continuum can occur with the implementation of a Thera-Band® Exercise Ball as pictured in figure 5 (a-c) to further challenge the player and allow for greater amounts or proprioceptive challenge with the exercise. Additionally, use of kinetic chain rotation during the movements once the initial dynamic movement is tolerated and controlled by the player further increases the tennis specificity of these stretches. Rotation can best be induced by having the player perform groundstroke movements (forehands and backhands) initially without a racquet and then

with a racquet to add greater challenge and specificity with the exercise. The application of these exercises to the tennis players program can both prevent injury and enhance performance.

