

ABSTRACT

DYNAMIC AND ELECTROMYOGRAPHIC CHARACTERISTICS OF THE
FOREHAND AND BACKHAND IN TENNIS PLAYERS: ONE BIOMECHANICAL
PERSPECTIVE TO EVALUATE THE PERFORMANCE

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The forehand and the backhand are the most common movements in tennis. They are technical strokes of complex execution because they depend on perfect temporal synchronization between the racket's movement and the ball's trajectory. The tennis literature on the subject shows that the feet's positioning is crucial to generate power during these strokes. Two kinds of forehand are identified: the forehand open stance (FOS) and the forehand square stance (FSS). The backhand, since its origin, has appeared in two forms: the one-handed grip (BK1) and the two-handed grip (BK2). Scientific research on the subject has been conducted regularly during the two decades. Hence, the aim of this study is to describe the biomechanical characteristics within dynamic, kinematic and electromyographic parameters, and according to variables and experimentally related muscles in relation to the four different tennis techniques. In addition, through knowledge of these biomechanical characteristics, this thesis intends to identify the influences on technical sports performance. The sample was composed of males (n=10) that have mastery of the forehand and backhand strokes. After analyzing the results that evolve Biomechanics variables studied, we realized that it's possible to partially accept the initial hypothesis of our study: the forehand open stance and backhand strokes with both hands demand greater muscle activation when they are

compared with forehand square stance and backhand stroke with just one hand, respectively. Still, observing the results of electromyography, we verified the predominance of the highest values of muscle activation for forehand open stance and backhand strokes with both hands during the post-impact phase, it's, thus, confirming the initial hypothesis. However, during the pre-impact phase, the highest values of muscle activation were observed in the forehand square stance and backhand strokes with one hand, counteracting, in this way, the initial hypothesis. We concluded, therefore, distinct behaviors between the two forehand and backhand strokes, mainly to analyze the pre and post-impact phase, which allowed us a detailed technical analysis of the sportive gestures studied, owing to its structural complexity.

Keywords: biomechanics, dynamometry, electromyography, cinemetry, tennis, forehand and backhand