



The One-Handed Backhand and Tennis Elbow

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INTRODUCTION

- Research has often documented a link between the one-handed backhand and tennis elbow (i.e., tendonitis of the elbow). A recent review of tennis elbow research concluded that it is the rapid stretch of the forearm extensors (muscles in the upper arm that extend the forearm) after impact in the backhand that may be the mechanism of injury for this condition.
- We also now know that less skilled tennis players may be at even greater risk for developing tennis elbow because of their tendency to stroke backhand drives with the wrist in a more flexed position than skilled players. Becoming aware of the biomechanical factors that may be related to tennis elbow is critical to understanding and developing possible preventions for this injury.
- Therefore, a study is needed to examine the relationship between the shock produced during ball-racquet impact and the motions of the wrist and elbow that rapidly stretch the wrist extensors during tennis strokes such as the one-handed backhand.

GOALS OF THE STUDY

- The purpose of this study was to measure the shock during and the resulting wrist and elbow joint motion after impact in the tennis one-handed backhand for advanced and intermediate players with and without a history of tennis elbow.

SAMPLE

- Participants for this study were 16 male tennis players with an average age of 35 years. These athletes were all right handed and naturally used the one-handed backhand. Players were grouped into one of the following categories:
 - tennis professionals with no history of tennis elbow (PRO);
 - intermediates with no history of tennis elbow (- TE);
 - intermediates with a medically confirmed history of tennis elbow who now show no symptoms (+ TE).

METHOD

- After a warm-up and practice period, participants performed at least 30 flat one-handed backhand strokes down the center of a mock-tennis court with a machine-projected ball at typical rally speeds.
- Data was collected on muscle activation at the wrist and elbow and the motion path of the racquet during the backhand stroke.

WHAT DID THE STUDY FIND

- There were no significant differences in the basic movements of the backhand stroke between the three groups (PRO, - TE, and + TE) before ball/racquet impact.
 - All the players performed the stroke correctly with the elbow in almost full extension throughout the stroke.
- There were also no differences observed in racquet impulse after impact or the angular position or movement speed of the elbow between the three groups of players.
- There was a significant difference between wrist motion speed after ball/racquet impact between the PRO and + TE groups.
 - While the PRO group extended their wrist after impact (-4.4 radians/second), the + TE group flexed their wrists more slowly (0.42 radians/second) at this point in the stroke.



WHAT DID THE STUDY FIND / COACHING IMPLICATIONS

- This research and past studies have shown that increased stress on the muscles from repeated eccentric muscle actions of the wrist extensors may be an important influence in tennis elbow development.
- A major difference between the professional level players and intermediate level athletes who had once suffered from tennis elbow appeared to be a tendency for the pros to extend their wrist after ball/racquet impact, while the intermediates flexed their wrist after the moment of impact.
 - Therefore, encouraging the wrist extension technique in your players may help reduce the likelihood that they will develop tennis elbow from the repeated use of the backhand stroke.
 - Wrist strengthening exercises might help players adopt the post-impact extension of the wrist.
- A common novice technique error that has been found to lead to tennis elbow is a leading of the elbow through the backhand swing.
 - Correcting this maladaptive technique in your players could also reduce the likelihood they will develop tennis elbow

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