



Bigger Balls Not the Answer

Over the years, the International Tennis Federation (ITF) has revised the rules of tennis to increase the interest in and safety of the game. These alterations include the introduction of the tiebreak, foot fault rule, racquet head size limitations, and racket length limitations.

“In the early 1990s, concerns were raised involving the increasing speed in the game of tennis due to improvements in the racket. Several solutions to the power surge in tennis have been proposed including decreasing ball pressure, decreasing the mass of the ball, raising the height of the net, increasing the distance of the serve (which requires the creation of a new line behind the baseline), and increasing the size of the balls.”

Increasing the size of the ball had been suggested as the most practical method to slow down the pace of the game. As a result, the ITF sanctioned the use of a new 6% larger ball (Type 3 ball) for use on a trial basis.

However, a report to be published by Sports Medicine Australia (SMA) in the March edition of the *Journal of Science and Medicine in Sport* says that bigger balls do not provide an answer.

The study was carried out on beginning to intermediate level tennis players, at the University of Florida and California State University in the US.

To provide insight into the effect of oversize balls on player reaction and injury risk, the study examined the effect of ball size on racket acceleration at impact and reaction time during the volley. The volley provides controlled impact conditions to examine potential differences between standard and oversize balls and is a stroke where increased visibility of a larger ball could be expected to improve reaction time.

The paper reports that the 6 % increase in ball size did not shorten the reaction time in the volley among the beginning to intermediate level tennis players tested.

A parallel issue that larger balls may cause an increase in injury was also found to be unfounded. The study found no evidence of increased load to the hitting arm while executing a tennis volley using oversized balls for novice and intermediate players.

The paper suggested that future research on modifications of ball properties to slow the game should consider the use of different material properties, internal pressurisation, or felt covering and their effects on tennis players.

It noted that a change in ball size would affect many areas of the tennis industry that depend on the dimensions of ball size, such as ball machines and ball-retrieval devices.

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Effect of ball size on player reaction and racquet acceleration during the tennis volley

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Abstract

The purpose of this study was to examine the effect of ball size on reaction time (from ball projection to initial racquet movement), movement time (from ball projection to ball-racquet impact), mean rectified acceleration and vibration frequency of the racquet during the impact phase (100 ms duration after ball-racquet impact) of the tennis volley. Twenty-nine beginning to intermediate level tennis players performed volleys under 18 experimental conditions including variations in lateral contact location (forehand and backhand), ball type (Penn oversize, Wilson oversize, regular size), and ball speed (fast, medium, slow). A ball machine was shielded so that the subjects could not predict the ball trajectory before it was released from the machine. Outcome measures were determined using a miniature uni-axial accelerometer and a Photogate timing device. ANOVA with repeated measures and Tukey's post hoc tests were used in statistical analyses ($p < .025$). The reaction times for the fast speed were significantly shorter than the corresponding times for the slow speed and the reaction times for the forehand volley were significantly shorter than that of the backhand volley. The significant interaction in movement time between ball speed and ball type indicates that the benefits of the larger ball (to slow the game down) increase as the ball speed increases. No significant effect of ball type or ball speed, or interactions were found on mean rectified acceleration and vibration frequency. These results suggest that oversized balls would not cause an increased load to the hitting arm while executing a tennis volley.