

Decrease in Knee Flexion is observed in a Three Set Tennis Match on Knee Kinematics during the Tennis Serve

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ABSTRACT

Tennis matches can be long, physically challenging affairs. The course of a match is often determined by the serving proficiency of both players. While the serve has been extensively studied, the relationship between the serve and match length specifically regarding knee kinematics is not well documented in a real time environment. The purpose of the current study was to determine the effect a three-set tennis match had on knee kinematics during the serve. Eleven male collegiate tennis players (age: 19.6 ± 1.7) were recruited from The University of Texas at Tyler. All participants played a three-set match and digital video recordings of the first five serves and last five serves from each set were taken by placing reflective markers at hip, knee and ankle joints of all subjects. After digital videos were imported into a motion capture system (Vicon Motus), kinematic analyses were performed to calculate the knee flexion during the serve. Preliminary analyses showed a significant decrease in knee flexion from the beginning of the first set to the end of the third set. The average decrease was 6.13 degrees for all participants. Such results are consistent with previous studies which have shown that decreasing knee flexion has a detrimental effect on the serve and can cause a reduction in efficiency to occur as well. From this preliminary data a recommendation to coaches would be to cue the players in on their legs during the serve when a decrease in proficiency occurs during a match. Future study may use surface electromyography (EMG) to examine the contribution of muscle fatigue to the knee flexion during the serve in a three set tennis match.

