

KINEMATIC ANALYSIS OF VOLLEYBALL SPIKE

**Sonia Corrêa, Rafael de Menezes, Ronê Paiano, João C. Bojikian, Daniel Silva,
Daniel Ferreira, Almyr F. de Souza***

**Physical Education School, Presbyterian University Mackenzie, São Paulo,
Brazil**

*** Sport Club Pinheiros, São Paulo, Brazil**

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INTRODUCTION: Volleyball nowadays is, after soccer, the most practiced sport in Brazil (Bojikian, 2004). However, studies related to the patterns used by the athletes during training are not in common use, especially those aiming to help the coach detect failures. Our goal was to compare the kinematic pattern of the volleyball spike performed by three female athletes of the Sport Club Pinheiros who played as outside hitters. The analysed variables were: ankle, knee and elbow angles during the last step and jump, and the maximum height attained during the jump.

METHOD: Markers were placed on relevant anatomical points and a video camera (30hz) filmed the movements in the sagittal plane of the athletes. An assistant passed the ball to the setter, who backset the ball for the subject to spike the ball. In order to simulate the real play situation they were asked to run backwards after the spike and start a new approach without stopping for three times. The images were digitized and processed using programs from the Biomechanics Institute from Cologne, Germany.

RESULTS AND DISCUSSION: The ankle angles of athletes 1 and 2 at the support phase during the last stride reached a minimum of 60° , a value very near to the one described in literature, but athlete 3, who touched the ground with the toes first, reached a minimum of 120° . Athlete 3 had an approach more typical for a middle hitter, who does not need to use the total possible impulse, but needs to reach the net quickly. The athletes 1 and 2 had a longer approach, a characteristic of an outsider hitter. The knee angles were very similar for all three athletes till the flight phase, when athlete 1 reached a minimum flexion of 90° while the others kept the flexion at around 165° . The maximum height during the jump was equal for athletes 2 and 3 (1,80m) while athlete 1 reached 1,88m. Athlete 1 used the knee flexion during the flight more efficiently and this allowed her to keep the center of mass at maximum height for a longer time. This also generated a better control during the attack. Probably the major factor interfering in this variable was that she is the one who has a better impulse and reaches a greater height during the jump. The elbow angle curves were all very similar for 3 athletes: at the beginning of the jump they decreased the elbow angle in order to decrease inertia and gain angular velocity, and at the hitting moment they made a complete extension of the elbow to increase linear velocity.

CONCLUSION: It's important and necessary to increase the relationship between University and coaches. This study suggests that athlete 1 could be considered as the one who has a better mechanical pattern, athlete 3 should enhance her approach technique, and athletes 2 and 3 should work hard to improve their impulse for the jump.

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