THE EFFECT OF KICKING DIRECTION ON SOCCER INSTEP KICKING MOTION

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Introduction

Instep kicking is a fundamental technique in soccer. In the match situation, players have to kick the ball to various directions. Those directions are defined as the angle between approach and kicking direction. Although several studies have examined the effect of approach angle on soccer instep kicking motion [1][2][3], the three-dimensional nature (except the pivot leg knee) have never been clarified. The purpose of this study, therefore, was to illustrate the effect of kick directions on soccer instep kicking kinematics.

Methods

Nine experienced male soccer players were volunteered to participate in this study. They performed instep kicks using their right leg from three different approach angles (15, 45 and 75 degrees to the kicking direction; Here after AP15, AP45 and AP75, respectively). Their kicking motions were captured using four high-speed video cameras at 250Hz. The foot and ball velocity and kinematic parameters of the both leg including pelvis were calculated.

Results & Discussion

The absolute ball velocity was significantly lower in AP75 than those in other conditions (AP15:27.0±1.1m/s, AP45:27.2±1.8m/s and AP75:24.6±0.8m/s). The kicking directions (approach angle) had no significant effects on the absolute velocity of the foot (AP15:18.4±1.0m/s, AP45:18.9±1.3m/s and AP75:18.8±0.9m/s). However the larger kicking angle, the larger angle between foot velocity vector and kicking direction was observed. It was suggested that in the condition with large kicking angle, such as AP75, forced the players to swing the leg more diagonally. From this reason, the foot velocity component towards the kicking direction target was reduced, thereby producing the slower absolute ball velocity.

Most of pelvic rotation was appeared after the touchdown of the pivot leg. The larger kicking angle, the more pelvic rotation was indicated. Also, the hip internal rotation of the pivot leg was represented similar change pattern to pelvis motion. These results might explain that the hip internal rotation of the pivot leg has some dominant role for the pelvic rotation.

References

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