

KICKING DYNAMICS IN YOUTH, HIGH PERFORMANCE AND NOVICE PLAYERS

Nunome, H. 1)

1) Research Centre of Health, Physical Fitness and Sports, Nagoya Univ., Japan

Keywords: side-foot kicking, international player, novice players, joint moment

Introduction

Kicking is the biggest attacking option and most widely studied skill in soccer. The side-foot kick forms the foundation and is the most frequently used technique when a shorter and precise pass or shot is required, in particular for the penalty kick situation [1]. Our research group made a series of attempts to clarify the kinetic differences between the side-foot and instep kicking and highlighted that the hip external rotation torque dominantly exhibited in the side-foot kick caused the clockwise rotation of the thigh-shank plane at the later stage of kicking [2]. However, one player who recognized as a high performance player from the international standard exhibited a unique, contrary kinetic aspect of the side-foot kicking that was rather similar to that of novice kid's players. In this talk, I would like to address this unique, unexpected result and emphasize the discussion on the side-foot kicking mechanics.

Methods

The side-foot kick motion of elite youth players, an international player and novice kid's players, were three-dimensionally captured (200 fps). The kicking leg was modeled as a three-link kinetic chain composed of thigh, shank, and foot, from which joint moments, angular velocities and power due to the joint moments were computed.

Results and discussion

The youth players indicated that to hit the ball with the medial side of the foot, a complicated series of rotational motions are required for the side-foot kick. In particular, the hip external rotation torque was dominantly exhibited at the later stage of kicking. This may allow the hip external rotation motion to increase directly the forward velocity of the side foot, with which players can squarely impact the ball. In contrast, there was no dominant exhibition of the hip external rotation torque for the international and novice players. They use relatively simpler series of rotational motion that was generally recognized in the instep kicking. Through an interview made with the international players, it can be assumed that his unique feature of side-foot kicking brings him an advantage for his play. As apparently shown in his playing style, he is able to switch the kicking techniques interactively: the side-foot and instep, depends on the situation. The fact that a high performance player still possesses a similar side-foot kicking mechanics with those of the novice players would provide us a meaningful hint for how to initiate the side-foot kicking into novice kid's players.

REFERENCES

1. Grant, A. et al. (1998). *F. A. Coach. Assoc. J.* 2:18–20.
2. Nunome, H. et al. (2002). *Med. Sci. Sports Exerc.* 2028–2036.