

USING MOTION ANALYSIS TO IMPLEMENT AND ASSESS A TRAINING INTERVENTION TO IMPROVE SOCCER THROW-IN TECHNIQUE

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Introduction

The long throw-in has become a key attacking set-play in modern soccer. The run-up throw-in with a staggered stance (RUTISS) is the preferred technique to achieve maximal horizontal distance (MHD). Whilst release parameters vary between subjects and studies, ball release speed is the dominant variable for MHD [1]. The focus of this case-study was to use motion analysis to implement and assess a training intervention to improve technique thereby increasing the MHD of a subject performing a RUTISS.

Methods

Ten maximal effort RUTISS trials by a male subject in the national soccer program (age 16, height 1.59 m, mass 50.0 kg) were analyzed before and after a training intervention (9 x 15 minute sessions over 3 weeks). Twenty-five markers were placed on the subject and tracked using a six Vicon MX 13+ camera system (300 Hz). Shoulder, elbow and wrist joint centre linear velocities in the throw direction were calculated using the Vicon upper-body model. A Casio high-speed camera (EX-F1, 300 Hz) and SIMI digitizing software were used to calculate ball release speed, angle and height. From initial motion analysis data, the training focus was reducing ball release angle to alter the timing of release to coincide with peak wrist joint centre linear velocity (V_w).

Results & Discussion

Before the training intervention, the subject released the ball at an angle of 42 deg and ball release occurred before V_w (Figure 1). Post training intervention, ball release occurred at an angle 11 deg lower and very close to V_w as desired. MHD increased by 3.89 m (19%) mainly due to a 2.11 $m.s^{-1}$ increase in ball release speed whilst ball release was also 0.04 m higher.

Conclusion

Motion analysis data has been used to implement and assess a successful training intervention to improve a subject's RUTISS technique (timing of ball release) and consequently increase the MHD.

References

1. Linthorne, N., and Everett, D. (2006). *Sports Biomechanics*, 5(2): 243-260.

Figure 1. Upper-limb joint centre linear velocities in throw direction relative to ball release at 0.0s.

