

MOTION OF LOWER EXTREMITY JOINTS DURING RUGBY TACKLE

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Introduction

Tackle in rugby creates an opportunity of turnover and increases the number of offence, so that the opportunity to score will increase. Furthermore, tackle is an individual skill, which directly contributes to the victory. This study aimed to clarify the difference of tackle motion in lower extremity among different levels.

Methods

Five high school rugby players, ten college rugby players, and two professional rugby league (the Top League) players were recruited as subjects. MAC 3D System was used for three-dimensional analysis, and infrared reflection markers were placed on each joint. These markers were measured by six infrared cameras (100Hz). Subjects ran up enough, landed on the force plate, and tackled on the tackle bag, on which the acceleration sensor was fixed. Three phases of tackle movement were defined. The time point of the last step before tackling is “foot contact” (FC), when the tackle bag is crashed is “tackle” (T), and when the foot is off the ground after tackle is “foot off” (FO).

Results & Discussion

Change of angle and angular velocity of lower extremity joints were analyzed. Angle of hip at T phase was larger in the players having high competitive level. Fig. 1 shows the change of angular velocity of hip joint for three groups. The angular velocity of pro rugby players was lower than that of the other two groups at FC phase, almost same at T phase, and higher at FO phase. This means that extension acceleration of hip joint of players having higher competitive level was higher.

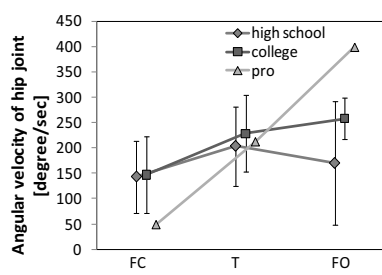


Fig. 1 angular velocity of hip joint

Conclusion

The angular acceleration of hip joint in pro rugby players was higher. Previous study [1] revealed that impact of the tackle bag was higher for the players having high competitive level. Therefore, it can be considered that higher extension acceleration of hip joint contributed onto a higher impact on the tackle bag.

Reference

1. Mio Arai *et al.*: 2010, Impact Characteristics of Rugby Tackle by Players in Different Age and Competitive Level. *Japanese Journal of Ergonomics* (41) 422-423.