

BIOMECHANICAL ANALYSIS OF A RUGBY PASS FROM THE GROUND

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Keywords: biomechanics, rugby union, passing

Introduction

Passing the ball from the ground is a fundamental skill in the game of rugby, with approximately 45% of the 300 passes that occur during a game being initiated off the ground¹. The task demands of this skill require the ball to be delivered accurately over distances ranging from less than 1 m to over 10 m. The aims of the study were to describe the biomechanical determinants of passing velocity in a group of highly proficient players. In addition, analysis included assessment of whether these determinants changed when passing to the player's dominant or non-dominant side.

Methods

Thirteen semi-professional rugby union players completed five passes to the left and right at a target positioned 5 m away. Kinematic data were collected using a seven camera motion capture system (250 Hz) prior to being processed to create a 15 segment three-dimensional model of the body. Pass accuracy was recorded using a simple 5 point scale. The effect of side dominance was determined via one-way ANOVA, while Pearson Product Moment and Spearman's Rank correlation coefficients tested the relationships between pass kinematics and ball release speed and pass accuracy. An alpha level of $P < 0.01$ was used throughout.

Results & Discussion

Overall, the passing action was characterized as having a pronounced forward and lateral shift of the centre of mass (COM) with relatively small movements in the trunk and pelvis. The upper arm action was unique to this activity and involved rapid flexion and internal rotation of the arm contralateral to the pass direction with rapid abduction in the ipsilateral arm. The range of motion in pelvic movements in both the frontal and transverse planes showed significant negative correlations with both ball release velocity and pass accuracy. This suggests that the pelvis should be kept relatively still during the passing action. Side dominance did not have a significant effect on either passing velocity or accuracy in these highly proficient players.

Conclusion

This study provided valuable normative data for use in future research on this fundamental rugby skill. The absence of a side dominance effect showed that the participants were highly skilled in this action.

References

1. IRB. (2010). <http://www.irb.com/mm/document/newsmedia/mediazone>.