

CHANGES IN SCAPULAR MOTION DURING A SIMULATED BASEBALL GAME

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INTRODUCTION: The importance of role of the scapula in throwing motion is reported in many clinical situations. Therefore, stability of the scapula in relationship to the entire moving arm is key point in the throwing motion. However, the scapular motion is often ignored in conventional biomechanical research. The purpose of this study was to investigate the changes in scapular motion during a simulated baseball game.

METHODS: One male college baseball pitchers threw 15 pitches in an inning for 9 innings (135 pitches) in an indoor pitcher's mound. Rest time between innings was 6 minutes. Three-dimensional positions of 47 reflective markers attached to subject were tracked by an optical motion capture system (Vicon Motion System 612, Oxford Metrics) with eight cameras (250Hz). For each subject 75 fastball pitches (1st, 3rd, 5th, 7th, and 9th innings) were chosen for analysis. Kinematic parameters were analyzed by simple linear regression analysis ($p < 0.05$). The scapula (shoulder girdle) coordinate system was defined according to the clavicle coordinate system and the thorax coordinate system. The scapular motion was scapular abduction/adduction (forward/backward) and scapular elevation/depression (upward/downward) (Figure 1).

RESULTS & DISCUSSION: The scapular adduction (backward direction) angle at stride foot contact was decreased with increasing the number of pitches. The scapular abduction-adduction range of motion during stride foot contact to ball release decreased with increasing the number of pitches (Figure 2). Decrease in the scapular range of motion is considered as decrease in the scapular adduction angle at stride foot contact.

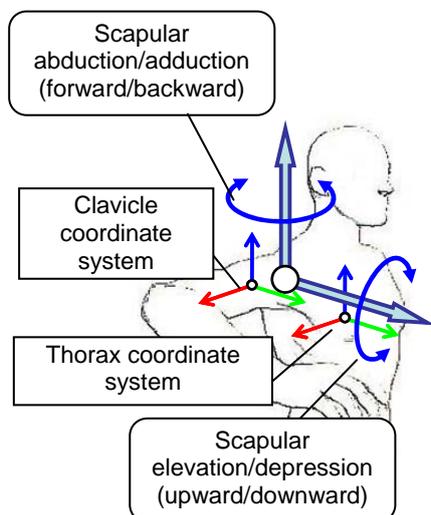


Figure 1. Scapular motion

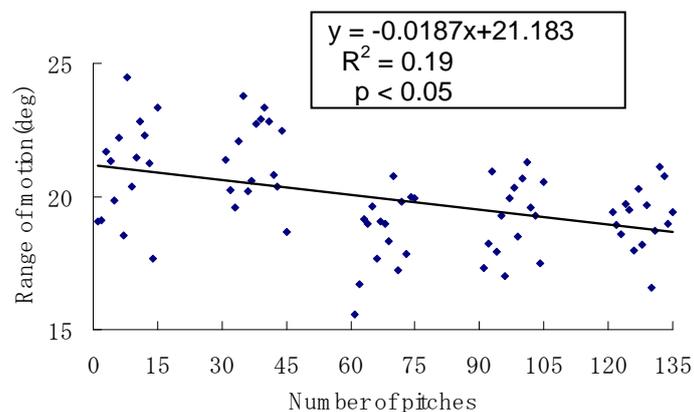


Figure 2. Scapular abduction-adduction range of motion during stride foot contact to ball release

CONCLUSION: This study shows that increasing the number of pitches decreases the scapular range of motion.

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