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Summer 8-12-2022

Development and Training of the American Football Quarterback

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Introduction

The American Football Quarterback position is often argued to be the most important position in all of team sports. The position always requires peak physical and mental performance and elite processing ability.

Being explored in this analysis is the training and development methods used in training the quarterback while also analyzing the reasons and validity of the programs being used.

Identifying the literature that already exists with published studies regarding the position, comparison of the position to baseball, and a breakdown of the phases of the throwing motion will be the focus of this analysis.

Summation

Majority of pre-existing literature fails to incorporate the lower body and lower body biomechanics into scientific research.

An overall failure to find an accurate comparison for the quarterback position as the baseball pitching motion and quarterback throwing motion are not similar in relation to the process taken before, during, and after the throw.

Perhaps a more accurate comparison for the quarterback position is that of an infielder in baseball. Considering the quarterback is under pressure from rushing defenses along with having to make throws in a timely manner, an infielder is forced to make throws under duress, whether that be with a runner advancing in their path or having to make a throw in time before the runner can reach a certain base.

It should be of importance for future studies regarding quarterback play to research and develop more effective training programs that incorporate lower body biomechanics.

Findings

Differentiation of Throwing Phases

Four Phase Quarterback Throwing Motion - *Upper Body Biomechanics Only*

- 1. Early Cocking** - initiated at the rear foot plant and continued to the maximal shoulder abduction and internal rotation.
- 2. Late Cocking** - started at maximal shoulder abduction and internal rotation and ended with maximal shoulder external rotation.
- 3. Acceleration** - phase began with maximal shoulder external rotation and ended with the ball release.
- 4. Follow-Through** - defined as the phase from ball release to maximal horizontal adduction across the body.

Eight Phase Quarterback Throwing Motion - *Incorporating Lower Body Biomechanics*

- 1. Stride Step** - the small step taken with the front foot of the quarterback prior to the throw.
- 2. Heel Alignment** - the aligning of the heels of the quarterback in a direct line to the target prior to the throw.
- 3. Back Hip Rotation** - the rotation of the back hip that thrusts forward during the throw.
- 4. Take-Away** - the moment the ball separates from the quarterback's front hand and begins to work backward prior to the throw.
- 5. Transition to "L"** - the transition period of rotating upward at the elbow on the throwing arm to form a 90-degree "L" shape with the throwing arm.
- 6. Pre-Drive Alignment** - the alignment of the quarterback's body prior to the throw.
- 7. Elbow Drive** - the high arcing motion of the elbow moving forward above the shoulder height of the quarterback during the throwing motion.
- 8. Release and Finish** - the moment the ball leaves the fingertips of the quarterback's hand to the completion of the motion.

Comparison to Baseball Pitching

Quarterbacks

- Maximum shoulder external rotation occurred earlier
- Shorter strides
- Stood in a more erect position at the point of ball release
- During arm cocking –
 - Higher elbow flexion
 - Higher shoulder horizontal adduction

Pitchers

- Maximum angular velocity of pelvis rotation occurred earlier and greater magnitude
- Greater and earlier upper torso rotation
- Greater and earlier elbow extension
- Greater and earlier shoulder internal rotation
- During arm deceleration –
 - Higher comprehensive force at the elbow
 - Greater comprehensive force and adduction torque at the shoulder

Reference List

- Cabarkapa, D., Mosier, E. M., & Fry, A. C. (2020, September 8). Kinetics and kinematics of commonly used quarterback throwing approaches – a case study. *The Sport Journal*. Retrieved August 4, 2022, from <https://thesportjournal.org/article/kinetics-and-kinematics-of-commonly-used-quarterback-throwing-approaches-a-case-study/>
- Fleisig, G. S., Escamilla, R. F., Andrews, J. R., Matuso, T., Satterwhite, Y., & Barrentine, S. W. (1996). Kinematic and kinetic comparison between baseball pitching and football passing. *Journal of Applied Biomechanics*, 12(2), 207-224.
- Kelly, B. T., Backus, S. I., Warren, R. F., & Williams, R. J. (2002). Electromyographic analysis and phase definition of the over the overhead football throw. *The American Journal of Sports Medicine*, 30(6), 837-844.
- Kobleski, G. P., Radel, L. C., Jones, J. C., O'Brien, M. J., Meehan, W. P., & Sugimoto, D. (2022). Comparison of pre-high school and high school football quarterback injuries. *The Physician and Sportsmedicine*, 1-5.
- Kovacs, M. S., & Kratzfey, T. (2015). A sport-specific performance and prevention program for the throwing quarterback. *Strength & Conditioning Journal*, 37(6), 37-42.
- Mirabile, M. P. (2005). Intelligence and football: testing for differentials in collegiate quarterback passing performance and NFL compensation. *The Sport Journal*, 8(2), 12.
- Our story*. Jenkins Elite. (2019, May 9). Retrieved July 26, 2022, from <https://jenkiselite.com/about/our-story>.
- Pulse QB*. Driveline Baseball (2021, August 18). Retrieved August 5, 2022, from <https://www.drivelinebaseball.com/pulse-qb/>.
- Smith, J., Winnier, S., Douglas, L., Ostranger, R. V., Anz, A. W., & Andrews, J. R. (2017). Electromyographic and motion capture analysis of the elbow and forearm in the overhead football throw. *Orthopaedic Journal of Sports Medicine*, 5(76).
- The Countries Best Quarterback Training & Development*. Jenkins Elite. (2022, April 13). Retrieved August 5, 2022, from <https://jenkiselite.com/quarterback-training>.
- Toffan, A., Alexander, M. J. L., & Peeler, J. (2018). Comparison of the technique of the football quarterback pass between high school and university athletes. *Journal of Strength and Conditioning Research*, 32(9), 2474-2497.