Diagnostic Ultrasound Imaging in Assessing Medial Elbow Joint Space in College Baseball Pitchers

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Abstract

The use of ultrasound imaging has been in medical practice since the 1950s and recently since the 1980s. The use of ultrasound imaging has been used more regularly to assist the accuracy of the clinical examination in the musculoskeletal orthopedic setting. The enhanced use has been attributed to the safe, portable and less expensive alternative to the MRI. Furthermore ultrasound imaging is an excellent compliment or alternative to other forms of radiography imaging since all patients can undergo sonography the use of sonography is more complimentary or alternative to other forms of radiography imaging since all patients can undergo sonography. The results of this investigation demonstrated that total innings pitched during a season and year of participation did not have an influence on the MJS width. Moreover, these data indicate that total innings pitched during a season and year of participation did not have an influence on the MJS width. Further research is recommended to perform multiple imaging testing throughout the entire year (Fall and Spring seasons) to determine specific time points at which MJS width changes in collegiate baseball pitchers.

Methods

Subjects: Thirteen NCAA Division I college men’s baseball pitchers participated with a mean age of 20.4 ± 1.45 SD and body mass index 24.56 ± 1.78 SD. Subjects gave written informed consent before participating, and the protocol was approved by Florida Gulf Coast University’s Institutional Review Board.

Design: A repeated measures, non-randomized 1 x 2 experimental design guided this study. The single independent variable was time with two levels (pretest and posttest). The dependent variable measured in this study was medial joint space (cm). The number of innings pitched and years of collegiate pitching were used as control variables to assess the potential influence of these variables on the dependent measure over the course of this investigation.

Procedures: Ultrasound images were obtained of the anterior band of the UCL on the participant’s throwing arm using a GE LOGIQ E ultrasound unit (GE Healthcare, Chicago, IL, USA) with a linear probe at 12 MHz. Participants were placed in a supine position with a wedge placed underneath their forearm to maintain their elbow angle at 30° flexion. A 5 Nm valgus stress was applied 20 cm distal to the medial epicondyle (see Fig. 1). Measurements from the apex of the trochlea to the apex of the ulna were taken (see Fig. 2) at the beginning of the competitive baseball season and then 6 weeks later. Three images were measured during each session and the average was used for analysis.

Results

The descriptive statistics for age, BMI, and 95% CIs were calculated for MJS width and the control variables. A paired samples t-test was used to assess differences in MJS width before and after a 6 week period during a competitive NCAA division I baseball season. Follow up paired samples t-tests were performed with total innings pitched during the 6 week time period and total years of intercollegiate experience were used as covariates to assess the potential influence of these control variables on MJS width.

The level of significance was accepted at the P ≤ 0.05 level.

Conclusion

Further research is recommended to perform multiple imaging testing throughout the entire year (Fall and Spring seasons) to determine specific time points at which MJS width changes in collegiate baseball pitchers. Furthermore, future research should focus on the relationship of the effects of the varying ROM at the shoulder and lower extremity to further determine other correlated factors affecting the increase of the MJS space.

References