

Paper #62

Outcomes by MRI Grade and Tear Location for Non-Operatively Treated Elbow UCL Injuries in Professional Baseball Players

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Summary:

There is a prognostic relationship of the MRI grade and tear location with the success of non-operative treatment for elbow UCL injuries in professional baseball players.

Abstract:

Purpose

To evaluate the prognostic relationship of MRI grade and tear location with outcomes for professional baseball players treated non-operatively for their elbow UCL injuries.

Methods: After obtaining IRB and MLB approval, we identified 544 professional baseball players from the MLB Health and Injury Tracking System (HITS) treated non-operatively for their UCL injuries from 2011-2015. Of these players, 237 MRI's were directly available for review by an independent, expert musculoskeletal radiologist who determined the grade (Grade I -edema, II-partial tear, III-complete tear) and location of the tear (humeral, ulnar, both-sided).

Player demographics and outcomes including return to throwing (RTT), return to play (RTP), failed non-operative treatment leading to UCL reconstruction (UCLR), and Kaplan-Meier survivorship analysis of the native UCL to re-injury or surgery based on MRI grade and tear location was measured. A multivariate analysis adjusting for age, MRI grade, tear location, and league status (Major = MLB; Minor = MiLB) was also performed.

Results: The average age of all players was 22.5 years, 10% played at the MLB level, and 84% were pitchers. The radiologist's grading was distributed as follows: Grade I (36%), Grade II (49%), and Grade III (15%) injuries. The tear locations were humeral (65%), ulnar (13%), and both-sided (22%). There were no statistically significant differences in RTT, RTP, and UCLR by grade or tear location. However, objectively, ulnar-sided tears had the lowest RTT (81%) and RTP (42%) compared to other locations. Objectively, the ulnar (58%) and both-sided (60%) tears had a higher rate of UCLR compared to humeral sided tears (51%, $p=0.441$). The survivorship analysis showed a consistent decline over time with increasing MRI grade. By location, humeral tears had the highest survivorship (1 yr = 51%; 2 yr = 44%). However, there was no statistically significant differences for either grade or location in the survivorship analysis. Multivariate analysis determined the likelihood of not returning to play was 3 times higher [95% CI: 1-9.3; $p=0.044$] for older players (>25) compared to younger players. The likelihood of having re-injury or UCLR after non-operative

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treatment failed was almost 6 times higher [95% CI: 1.5-21.7; p=0.012] for MLB players as opposed to MiLB players. MRI grade and tear location were not significantly predictive of returning to play, re-injury, or surgery.

Conclusions

To date, this is the largest study to evaluate the prognostic relationship of MRI grade and tear location with the outcomes after non-operative treatment for elbow UCL tears in professional baseball players. Lower MRI grade and humeral location are objectively associated with a higher RTT, higher RTP, lower UCLR, and higher survival than with higher grade, ulnar sided, or both-sided tears in the non-operative treatment of UCL injuries. Older age (>25) had a significantly higher likelihood of not being able to RTP after non-operative treatment. Competing at the MLB level had a higher likelihood of re-injury or having UCLR. Based on this study, non-operative treatment of UCL injuries will likely be more successful in younger players, lower grade tears, and humeral-sided injuries.