The Impact of the Pitch Clock on UCL Surgery Rates and Performance in Major League Baseball Pitchers

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INTRODUCTION: Major League Baseball (MLB) recently implemented a new pitch clock in 2023, raising debate on whether it has impacted injuries in pitchers.

METHODS:

Season to season surgery trends were evaluated and a retrospective case-control analysis was conducted on all MLB pitchers who underwent UCL surgery from the beginning of the 2018 season to the end of the 2024 season. Matched controls were identified in a 2:1 manner similarly to previous studies, and pitch timer data from matched pairs since 2023 was compared. Advanced analytic and pitch-tracking metrics were also analyzed to see if there was any impact from the pitch timer. Data was collected from public web sources affiliated with MLB and used in previous studies. Statistical analysis consisted of unpaired t-tests comparing cases and controls and binary logistic regression.

RESULTS:

There was a trend of surgeries happening earlier in the season since 2023 than in the four full seasons prior. Furthermore, there was a significant increase in the percentage of starting versus relief pitchers undergoing UCL surgery after the pitch clock was implemented (55% vs 30%; p =0.01). 52 MLB pitchers who underwent a UCL surgery were then identified with 104 matched controls. There were no significant differences in pitch timer duration or fast pitch percentage between cases and controls. There were also no significant differences in velocity, spin rates, pitch quality (Stuff+), overall pitching ability (Pitching+), strike-zone command (Location+), release points, approach/release angles, or extension. Outside of vertical movement, binary logistic regression did not identify any potential risk factors for UCL injury. There were no significant differences in pitch-tracking metrics between cases or matched controls before the implementation of the pitch clock (2018-2022) and after implementation (2023-2024; p>0.05).

DISCUSSION AND CONCLUSION:

Overall, this preliminary study suggests that the newly implemented pitch clock may not increase the overall rate of UCL surgeries in MLB pitchers. However, there's been a significant increase in the percentage of starting versus relief pitchers undergoing UCL surgery since the inception of the pitch clock. Reassuringly, the pitch clock also did not have a concerning impact on pitching performance in MLB pitchers. Further monitoring of injury trends following the implementation of the pitch clock in MLB is warranted.