

Study: MLB pitchers don't regain performance level after Tommy John surgery

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Major League Baseball players who undergo Tommy John surgery are less likely to regain the performance level they had before surgery, according to a Henry Ford Hospital study.

The study is the first to show a link between the surgery and declining pitching performance at the professional level. It also involved the largest cohort of professional [pitchers](#) to date to examine the issue.

Researchers analyzed pitching statistics of 168 MLB pitchers before and after surgery between 1982 and 2010 and found diminishing returns in three major pitching categories: Earned runs average (ERA), walks and hits per inning pitched (WHIP) and innings pitched (IP). The findings:

- ERA increased 4.15 to 4.74.
- WHIP increased 1.40 to 1.48.
- IP declined 59 to 50.

"Tommy John surgery is an effective surgery and most pitchers get back to pitching after surgery. But it's not going to improve their level of performance," says Vasilios (Bill) Moutzouros, M.D., a Henry Ford orthopedic surgeon and the study's senior author.

"There's been a perception that the surgery will make you better. Our findings debunk that perception. Eighty to 90 percent of [major league](#) pitchers will get back to pitching at the major league level but they just won't be as effective as they were before injury."

The study is being presented at the annual meeting of the American Academy of Orthopedic Surgeons March 11-15 in New Orleans.

Tommy John surgery, named after the former Los Angeles Dodgers pitcher who underwent the pioneering surgery 40 years ago, has been since performed on legions of pitchers at the professional and collegiate levels. In medicine it is known as ulnar collateral ligament (UCL) reconstruction. During the two-hour outpatient procedure, the ulnar collateral ligament in the medial elbow is replaced with a tendon from the same arm or from the hamstring area.

Until Henry Ford's observational study, other research had shown that a high percentage of players returned to the same level of performance after UCL reconstruction, and the perception among players, coaches and parents was that UCL reconstruction would even lead to a higher level of performance. In the only other study involving just MLB pitchers (68 pitchers), 82 percent of them returned to the mound after surgery and had no significant decline in performance.

Henry Ford researchers sought to examine the effects of UCL reconstruction on pitching performance involving the largest cohort of MLB pitchers and identify risk factors associated with the pitching injury, says Robert Keller, M.D., a third-year Henry Ford orthopedic resident and study co-author whose father Phil was a teammate of Tommy John in the 1970s.

The cohort of 168 pitchers pitched in at least major league game after undergoing UCL reconstruction between 1982 and 2010. Data collected included the year of surgery, pitchers' age, years of MLB experience, height/weight, body mass index, pitching arm injured, pitching role, pitching statistics, and whether the pitcher returned to MLB pitching after surgery. This was then averaged for the three years of pitching before UCL reconstruction and for the three years after returning to

play.

For comparison, researchers collected similar data of 178 MLB pitchers in a control group with no prior UCL reconstruction and age-matched them with a corresponding UCL reconstruction pitcher. Performance was determined using three years of statistics before their "index year" (their roster year of either 2004 or 2005) and three years after their "index year."

Drs. Moutzouros and Keller used paired analysis, generalized estimating equation model and other commonly used research tests to evaluate the data. Other highlights:

- UCL pitchers were "statistically better" than the control group in ERA, WHIP, IP and win percentage in the three years and two years before surgery.
- In the year before surgery, UCL pitchers' performance declined significantly.
- After surgery, the [control group](#) was either superior in nearly every performance measure or no difference observed.
- A predictor of surgery is MLB experience. Sixty percent of pitchers required UCL reconstruction within their first five years in the MLB.

While the cause of UCL injury is not fully known, orthopedic specialists theorize it's due to overuse and stress on the elbow, [pitching](#) velocity and joint motion, Dr. Keller says, adding that surgery isn't a panacea.

"We even have parents who come into our clinic asking if their children can have the surgery even before they injure anything because they think potentially it can make them better. What this study shows is it doesn't. Matter of fact, players get statistically worse after having this [surgery](#)."

Provided by Henry Ford Health System

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