Original Article

Defensive Performance Declines in Ultimate Fighting Championship Fighters Following Anterior Cruciate Ligament Reconstruction

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Purpose: To evaluate the impact anterior cruciate ligament reconstruction (ACLR) has on strike evasion rates, strike and landing rates, win percentage, and career longevity in Ultimate Fighting Championship (UFC) fighters. **Methods:** UFC fighters who underwent ACLR from 1993 to 2022 were matched 2:1 with uninjured controls. The percentage of each injured fighter's career that occurred before ACLR was deemed the "index percentage." Injured fighter performance pre-/post-ACLR was compared with control metrics pre-/postindex percentage. **Results:** Of the 82 patients with documented ACL injuries identified, 48 met the inclusion criteria. Of these, 27 returned for more than 2 fights and were paired with 54 controls. UFC fighters demonstrated return-to-sport rates of 81.25% and 56.25% for at least 1 and 2 fights, respectively. On average, it took 411.85 ± 174.73 (range, 165-879) days for fighters to return. All fighters had significantly lower evasion rates against total significant strikes, distance strikes, and head strikes, postindex ($P < .05$ for each). ACLR fighters had significantly lower submission attempts and evasion rates against clinch strikes, ground strikes, and total strikes, postindex ($P < .05$ for each). Controls had a significantly lower evasion rate against leg strikes, postindex. Both groups' win percentages significantly declined (ACLR, $P = .001$; control, $P = .012$). No significant difference in total career fights was observed ($P = .873$). **Conclusions:** In this study, we found that most UFC fighters who undergo ACLR return to sport for at least 1 fight; however, just over half return for at least 2 fights. There was not a significant difference in career length between fighters who returned to sport following ACLR for at least 2 fights and their controls. Defensive performance, but not offensive performance, declined significantly following ACLR. All fighters demonstrated significant declines in their win percentage as their career progressed, irrespective of ACLR. **Level of Evidence:** Level III, retrospective comparative study.

The Ultimate Fighting Championship (UFC), founded in 1993, is a mixed martial arts (MMA) promotion company.[1] Since its inception, criticism of MMA and the UFC has revolved around fighter safety and the high incidence of injuries. Given that victories are obtained by means of striking and grappling, an inherent reality of injuries exists. Across the UFC, fighters commonly experience injury to virtually all areas of the body, including the face, head, neck, chest, abdomen, back, and extremities.[2-7] Of the injuries sustained, the most common are facial lacerations, concussion/head injury, and upper and lower extremity injuries.[2,8-11]

The anterior cruciate ligament (ACL) serves the knee as the primary stabilizer against anterior tibiofemoral translation and tibial internal rotation and is commonly injured via traumatic tibial internal rotation, sharp deceleration or landing at full knee extension, or contact to the knee resulting in valgus collapse.[12-14] As such, professional mixed martial artists are at high risk for ACL injury. However, true incidence of ACL tears in the UFC is limited, with a recent epidemiologic study combining ligament/tendon injuries together without specifically mentioning ACL injury patterns.[15] One orthopaedic clinic noted that 4% of athletes treated for ACL injury came from those participating in martial arts.[16]

Injury to the ACL is among the most common injuries to the knee requiring surgery to return to high-level

athletic activities.[17,18] Athletic performance following ACL reconstruction (ACLR) has been explored in a variety of professional sports leagues, such as Major League Baseball (MLB), the National Basketball Association (NBA), and the National Football League (NFL); these investigations observed a spectrum of post-ACLR performances ranging from significant decline to no significant impact at all.[2,19-24] However, a paucity of information exists regarding the athletic outcomes associated with ACLR among UFC athletes. The purpose of the present study is to evaluate the impact ACLR has on strike evasion rates, strike and landing rates, win percentage, and career longevity in UFC fighters. We hypothesized that offensive and defensive statistics of injured fighters would significantly decline but did not expect a significant difference in post-ACLR win percentage, relative to their uninjured counterparts.

Methods

A retrospective review was performed of ACLR undergone by UFC fighters from the inception of the UFC in November 1993 to December 2022 utilizing previously published methods.[6,21,25-30] Fighters who had their ACL reconstructed were identified from public Internet sources such as UFC.com, ESPN.com, MMA-Fighting.com, and reputable news outlets. The inclusion criteria for the study included all UFC fighters who experienced first-time ACL injuries and required reconstruction while in the UFC. Fighters were excluded if they had concomitant ligamentous injury apart from a medial collateral ligament sprain treated nonoperatively, concomitant injury of other body parts requiring surgery, a history of ACL or multiligamentous knee injury on either knee, any history of knee surgery within 3 years of their ACL injury requiring reconstruction, or zero UFC fights prior to ACL injury. Fighters were not excluded if they had a concomitant medial or lateral meniscus injury due to how common meniscal injury is in the setting of ACL rupture. Furthermore, fighters were not excluded if they had a prior knee arthroscopy or meniscectomy if it was obtained more than 3 years before their ACL injury and was not performed to treat a ligamentous injury. To verify that each fighter truly received ACLR for inclusion, 2 investigators (J.G. and H.D.) each gathered 2 independent resources that corroborated the injury and surgery. Prior knee injury was assessed using public Internet sources for all fighters who had undergone ACLR and for included fighters' controls. Following a similar protocol by Kingery et al.,[6] a cohort of UFC fighters who underwent ACLR was compared to a cohort of uninjured counterparts using publicly available resources. Injured UFC fighters who met the aforementioned criteria and completed at least 2 fights without injury to any body part requiring surgery or

nonoperative rehabilitation following ACLR were matched 2:1 with healthy control UFC fighters using height, weight, reach, birth year, and age at first fight. When greater than 2 control options were presented for an injured fighter, the 2 control fighters selected were those that had the most similar preindex win percentage to the injured fighter. These methods of selecting control fighters were done in an effort to minimize discrepancies between the baseline skill level, anatomy, and career chronology of injured fighters and their controls. Controls were excluded if they had undergone a documented knee surgery during their careers in the UFC.

Demographic data such as date of the first fight, age at the first fight, and date of the last fight were collected for all fighters. For injured fighters specifically, additional data such as date of injury, age at injury, date of the first match after returning from ACLR, and age at the first return match were collected. Fight performance data from the UFC's inception to July 2023 were scraped from UFCstats.com, which includes metrics from all MMA fights owned by UFC/Zuffa LLC. The individual fight statistics scraped for our analysis were total strikes, total significant strikes, significant head strikes, significant body strikes, significant leg strikes, significant strikes from distance, significant strikes in the clinch, significant strikes on the ground, submission attempts, and win/loss. For reference, the term *significant strike* is used by the UFC to describe an intentional, high-powered strike from short range or long range; short-range, low-powered strikes do not count as "significant strikes" but are included in the "total strike" category. In addition to using the above match statistics to assess fighter performance, we also manually calculated mean strikes attempted per round (calculated by dividing the number of strikes attempted in a match by the number of rounds of the match) and the accuracy of and evasion against strikes per match (calculated as the percentage of strikes landed of those attempted by the fighter and 100% − the percentage of strikes landed of those attempted by their opponent, respectively). Using these statistics, a comparative analysis was done to assess for differences in preinjury and postinjury performance. To compare the performance of injured fighters to that of healthy controls, we calculated the percentage of each injured fighter's careers that occurred prior to ACLR by dividing the number of fights before injury by the total number of fights fought during their career; this percentage was deemed the "index career percentage." Performance before and after the index career percentage of each injured fighter was compared with the performance of matched controls whose careers were likewise matched and normalized to the index career percentage. For example, if fighter X underwent ACLR after their fifth of 10 total fights (50% into their career), their controls'
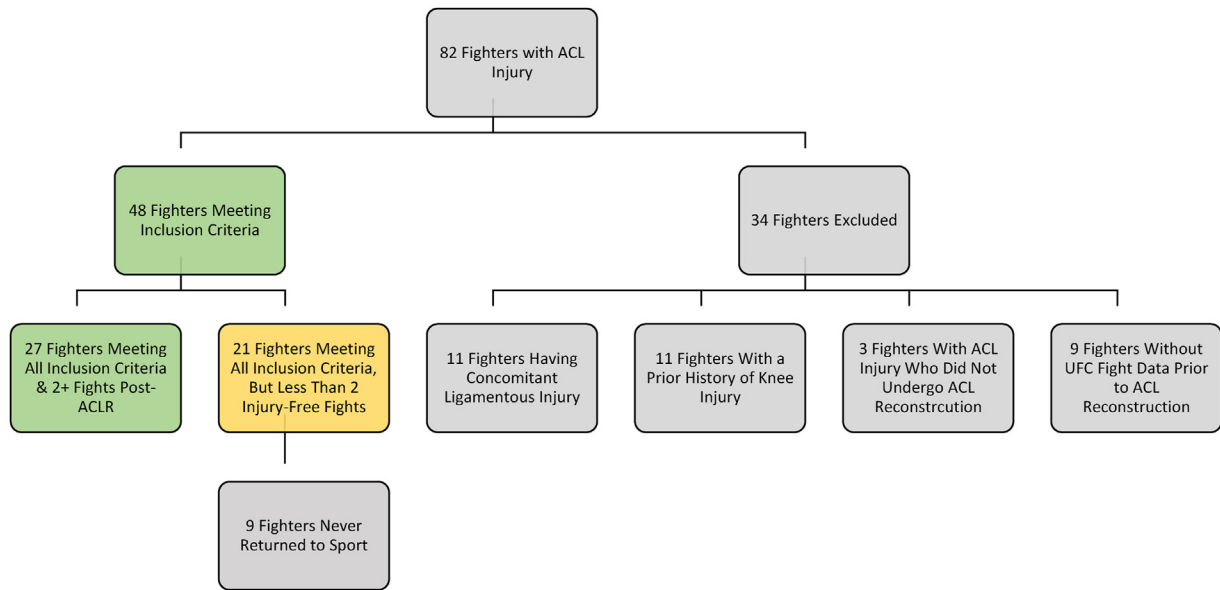
Fig 1. Flow diagram depicting the process by which Ultimate Fighting Championship fighters who sustained an ACL injury were included or excluded in our performance analysis. (ACL, anterior cruciate ligament; ACLR, anterior cruciate ligament reconstruction.)

"preindex" period would be defined as the first 50% of their career fights and their "postindex" period would be defined as the latter half of their career fights.

Statistical Analysis

Pre- versus postindex comparisons were attained using paired t tests when data were normally distributed. Wilcoxon signed-rank tests were used for continuous variables with non-normal distributions. Unpaired t tests were used to compare demographic and pre- versus postindex deltas between the injured and control groups when normally distributed, while a Mann-Whitney U test was used when data were not normally distributed. All statistical analyses were run using IBM SPSS Statistics for Macintosh, version 28.0.1.1 (IBM Corp.).

Results

Across the 6,916 UFC fights held between the first ever UFC event in 1993 to the final UFC event of 2022, our investigation identified 82 documented ACL injuries and 79 documented reconstructions, yielding an incidence of injury of 1 ACL injury per 84.34 UFC fights and an incidence of ACLR of 1 ACLR per 87.54 UFC fights. Of the 82 fighters with documented ACL injuries, only 48 met all inclusion criteria (Fig 1). Of these 48 fighters, 81.25% (39 of 48) returned to the UFC for at least 1 fight following their ACLR, but only 56.25% of fighters (27 of 48) returned for at least 2 fights without further injury. These 27 fighters (22 men, 5 women) were included in the final analysis and matched to 54 controls. The mean age at ACLR for UFC fighters was

30.04 ± 3.83 years. On average, ACLR occurred 1,815.63 ± 1,502.30 days from their first UFC fight, and 411.85 ± 174.73 (range, 165-879) days elapsed before their return match following their surgery.

No significant differences existed between the injured and control fighters in demographic variables by which the controls were matched to their injured counterparts (Table 1). Furthermore, no significant difference was observed between the injured and the control groups with respect to age at last fight (injured mean 35.37 ± 4.62, control mean 34.78 ± 4.25, $P = .567$) and total number of career fights (injured mean 14.44 ± 6.82 fights, control mean 14.17 ± 7.60 fights, $P = .873$) (Table 1).

Postindex performance in both groups, compared to preindex, demonstrated significantly lower rates of evasion/defense against significant strikes as a whole (injured $P < .001$, control $P = .003$), strikes from a distance (injured $P = .008$, control $P = .001$), and strikes to the head (injured $P = .006$, control $P < .001$) (Table 2). Additionally, there was an overall reduction in win percentage postindex compared with preindex for injured fighters (median 50% vs 67%, $P = .001$) and control fighters (median 45% vs 67%, $P = .012$) (Table 3). However, these reductions in average win percentage (delta win percentage) and defense against strikes as a whole, strikes from distance, and strikes to the head (delta evasion rate) were similar between groups (Table 4).

Injured fighters demonstrated a significantly lower rate of evasion/defense against strikes in the clinch ($P = .003$), strikes on the ground ($P = .04$), and total

Table 1. Demographic Data of Ultimate Fighting Championship Fighters Who Met Inclusion Criteria and Their Controls

Demographic and Longevity Data	ACLR (n = 27)	Control (n = 54)	P Value
Height, in.	69.11 ± 3.52	69.29 ± 3.27	.815
Weight, lbs.	159.44 ± 35.06	159.56 ± 35.37	.989
Reach, in.	70.78 ± 4.46	70.74 ± 3.90	.966
Birth year	1984 ± 6	1984 ± 6	.941
Age at first fight, yr	25.19 ± 3.46	26.56 ± 3.87	.124
Age at last fight, yr	35.37 ± 4.62	34.78 ± 4.25	.567
Total career length (fights)	14.44 ± 6.82	14.17 ± 7.60	.873
ACLR only			
Age at injury, yr	30.03 ± 3.83		
Days between first fight and injury	1,815.63 ± 1,503.29		
Days between injury and return fight	411.85 ± 174.73		
Number of fighters with concomitant meniscal injury	5 (18.52)		
Number of fighters with concomitant MCL sprain (nonoperative)	1 (3.70)		
Number of fighters with prior arthroscopy (nonligamentous indication) >3 years prior to ACL rupture	1 (3.70)		

NOTE. Values are presented as mean ± SD or number (%).

ACL, anterior cruciate ligament; ACLR, anterior cruciate ligament reconstruction; MCL, medial collateral ligament.

strikes ($P = .011$), and they attempted significantly fewer submission maneuvers on their opponents ($P = .004$) postindex compared to preindex (Tables 2 and 3). Control fighters did not experience significant differences in preindex versus postindex in these aforementioned performance measures.

Compared with preindex, control fighters demonstrated significant reductions in postindex evasion/defense against strikes to the leg ($P = .019$), attempted strikes in the clinch ($P = .012$), and attempted strikes on the ground ($P = .004$) (Tables 2 and 3). Furthermore, control fighters had a significantly higher rate of successful strikes from a distance ($P = .026$) postindex (Table 3). Injured fighters did not experience significant differences preindex versus postindex in these aforementioned performance measures.

Discussion

In this study, we found that following ACLR, UFC fighters experience a significant impact on their

Table 2. Preindex and Postindex Defensive Statistics of Fighters Who Underwent ACLR and Their Controls

Defensive Statistics	Preindex, Mean ± SD	Postindex, Mean ± SD	P Value
Total strike evasion rate			
ACLR	**0.52 ± 0.12**	**0.46 ± 0.09**	**.011**
Control	0.51 ± 0.12	0.48 ± 0.08	.109
Significant strike evasion rate			
ACLR	**0.61 ± 0.08**	**0.54 ± 0.08**	**<.001**
Control	**0.59 ± 0.10**	**0.55 ± 0.07**	**.003**
Significant head strike evasion rate			
ACLR	**0.68 ± 0.10**	**0.62 ± 0.08**	**.006**
Control	**0.68 ± 0.09**	**0.63 ± 0.07**	**<.001**
Significant body strike evasion rate			
ACLR	0.31 ± 0.19	0.29 ± 0.14	.638
Control	0.32 ± 0.13	0.30 ± 0.09	.236
Significant leg strike evasion rate			
ACLR	0.27 ± 0.15	0.24 ± 0.19	.517
Control	**0.24 ± 0.21**	**0.17 ± 0.12**	**.019**
Significant clinch strike evasion rate			
ACLR	**0.40 ± 0.17**	**0.28 ± 0.13**	**.003**
Control	0.35 ± 0.13	0.30 ± 0.15	.098
Significant ground strike evasion rate			
ACLR	**0.34 ± 0.17**	**0.23 ± 0.16**	**.040**
Control	0.30 ± 0.14	0.26 ± 0.16	.148
Significant distance strike evasion rate			
ACLR	**0.66 ± 0.08**	**0.61 ± 0.07**	**.008**
Control	**0.65 ± 0.09**	**0.61 ± 0.07**	**.001**

NOTE. Evasion rate = 1.00 − strikes landed by opponent per fight / strikes attempted by opponent per fight. All bolded values represent statistically significant values post-index versus pre-index.

ACLR, anterior cruciate ligament reconstruction.

Table 3. Offensive Statistics (Strikes Attempted per Round and Strike Accuracy) of Fighters Who Underwent ACLR and Their Controls in Which a Statistically Significant Difference Was Observed Postindex Versus Preindex

Statistically Significant Offensive Statistics and Win Percentage	Preindex	Postindex	P Value
Strikes attempted per round			
Control: Significant clinch strikes attempted per round	4.11 ± 2.98	3.07 ± 2.56	.012
Control: Significant ground strikes attempted per round	3.52 (1.76, 6.38)	2.08 (1.14, 4.34)	.004
ACLR: Submission attempts per fight	0.50 (0.00, 1.00)	0.08 (0.00, 0.25)	.004
Accuracy			
Control: Significant distance strike accuracy	0.36 ± 0.11	0.40 ± 0.12	.026
Win percentage			
ACLR	67 (50, 100)	50 (29, 63)	.001
Control	67 (42, 75)	45 (25, 60)	.012

NOTE. Values are presented as mean ± standard deviation or median (interquartile range). Accuracy = strikes landed per fight / strikes attempted per fight. Non−statistically significant offensive statistics can be found in Appendix Table 1.

ACLR, anterior cruciate ligament reconstruction.

defensive performance, which is more significantly affected than their offensive performance. In addition, career length and win percentage following ACLR remain similar to that of matched controls after successful return to sport.

A meta-analysis that examined return to sport across multiple professional sports, including baseball, basketball, American football, soccer, rugby, ice hockey, alpine and freestyle skiing, snowboarding, and handball, reported an overall return to sport rate of 83%.[31] Investigations pertaining to professional American football, soccer, baseball, and basketball players revealed return-to-sport rates of 67.2%, 80%, 88%, and 86%, respectively, following ACLR.[26,32-34] Following ACLR, UFC athletes in the present study returned to compete in at least 1 fight at a rate of 81.25%. However, of the 48 UFC fighters that returned for at least 1 fight, 12 fighters (25%) did not compete in any additional fights thereafter. As such, it may be argued that only 56.25% of UFC fighters truly returned to sport successfully, given that only these 27 fighters returned for at least 2 injury-free fights, which is markedly lower than the aforementioned rate. To compare the return-to-sport rates of UFC fighters following ACLR to athletes of other professional sports leagues would be inappropriate due to how vastly different the UFC is from these other sports with respect to physical demand and frequency of competition.

Unlike other professional sports such as baseball, basketball, American football, and soccer, in which athletes compete on a weekly or even daily basis, fighters in the UFC only fight a few times per year. Additionally, although these other sports feature extensive player-on-player physical contact, the goal of these sports is not to inflict a sufficient amount of direct damage to an opponent to achieve victory. As such, the decision for a UFC fighter to return to sport would entail enlisting and preparing for perhaps a handful of fights, whereas a professional athlete in the other sports may need to prepare themselves to participate in dozens to hundreds of games; this aspect of UFC may artificially inflate the rate of return to sport. Conversely, however, a UFC fighter must also consider that returning to sport also equates to putting themselves in situations in which their opponents are actively attempting to inflict damage upon them, whereas a professional baseball or basketball player, for example, would not need to have this consideration; this aspect of UFC may artificially deflate the rate of return to sport.

Notably, no significant difference in total career length was appreciated between the ACLR and control groups. Therefore, the natural history of UFC careers may explain why some athletes returned for only 1 further match, perhaps due to the physical demands of the sport. This is not an uncommon phenomenon

Table 4. Comparison of the Deltas of Preindex Versus Postindex Statistics Between the Injured and Control Fighters for Measures in Which Both Groups Displayed Significant Differences Preindex Versus Postindex

Measures in Which Both Groups Displayed Significant Differences Preindex vs Postindex	Δ ACLR (n = 27)	Δ Control (n = 54)	P Value
Significant strike evasion rate	−0.07 ± 0.09	−0.04 ± 0.10	.355
Significant distance strike evasion rate	−0.05 ± 0.09	−0.05 ± 0.10	.917
Significant head strike evasion rate	−0.07 ± 0.11	−0.05 ± 0.10	.604
Win percentage	−33 IQR (−50, −3)	−23 IQR (−37, +15)	.201

NOTE. Values are presented as mean ± standard deviation or median (interquartile range). Δ = postindex − preindex.

ACLR, anterior cruciate ligament reconstruction.

among physically demanding contact sports. For example, the average career length of NFL players has been noted to be only 3.3 years, and thereby, returning to play in an NFL season following ACLR is considered a successful return to sports, irrespective of how many subsequent seasons are played.[35-38] Whether a shortened career for those who only returned to a single fight can be attributed to ACLR or the nature of a professional MMA career is impossible to ascertain from these data.

All fighters, irrespective of ACLR, were less effective in defending significant strikes to the head and from a distance as their careers progressed. However, only those who underwent ACLR were less effective at guarding against total strikes, defined as the sum of all significant and nonsignificant strikes, and significant strikes in the clinch and on the ground. Interestingly, fighters who underwent ACLR did not experience a significant decrease in defense against significant strikes to the knee. The dichotomy from these results—that ACLR fighters were less effective in guarding in most situations except for against their knee—may be explained theoretically by extra caution given to the operative knee in an effort to prevent reinjury.[39-42] The authors postulate that fighters who return to MMA following ACLR may be hyperprotective of their knee relative to other body parts.

There is insufficient evidence in the present investigation to suggest that ACLR alone significantly decreased a fighter's win percentage, given that control fighters also experienced a similar decline in winning percentage. This finding corroborates similar findings by Kingery et al.,[6] who demonstrated no significant difference in win percentage between injured and uninjured groups of MMA athletes. However, their study incorporated all injuries and did not specifically focus on ACLR, and the authors attributed any differences to increasing fighter age at the time of injury. In addition, older fighters who incur injury may retire from the UFC because they are winning less frequently.[6] The present study further analyzed the delta win percentage—the change in win percentage postindex relative to preindex—and compared the delta between groups. There was no significant difference in delta win percentage between ACLR and control groups, further supporting that this decline appears to be attributed to the natural history of an aging fighter rather than ACLR.

It is important to contextualize these findings among the current literature for other major sports, where authors found that ACLR had mixed effects on performance and athletic ability. In the NBA, 2 investigations reported a marked, but not significant, decline in performance, as measured by player efficiency rating.[43,44] This is corroborated in the study by Mehran et al.,[23] in which basketball players who underwent ACLR

demonstrated equivalent performance measures of jumping ability, speed, and quickness compared to counterparts without ACLR. Similarly, within the MLB, there was no difference in primary performance outcome measures, which were earned run average, walks plus hits per inning pitched, fielding independent pitching, and wins above replacement, between injured athletes and matched controls.[20] In the NFL, however, a systematic review demonstrated that performance among NFL players was negatively impacted by ACLR, although it should be noted that athletic ability (as measured by speed, acceleration, vertical leap, and agility) was not impacted by ACL injury.[21,33] The differences observed between these different sports may be explained by the nature of the sport itself and the degree to which the movements in the sport, such as abrupt deceleration, knee hyperextension, and physical contact resulting in valgus collapse, place stress upon the ACL. The nature of these differences warrants further research.

Although longevity and overall performance were not significantly impacted, UFC fighters did experience a longer time to return to sport compared to other professional athletes, with an average return to sport of 411.85 days. In other major professional sports leagues, such as the NFL, NBA, and MLB, the time for return to sport averaged between 300 and 350 days.[20,33,44] At this moment, it is unclear if the prolonged time for return for UFC fighters is due to the nature of the sport or the logistics of scheduling. Because the UFC does not have regularly scheduled seasons, and because fighters only participate in 2 to 4 fights per year on average and occasionally even less frequently, this may artificially prolong the time for return to sport when compared to sports with regular seasons and more frequent games.[2,45] Further research may be needed to better understand the physical demands of MMA competitions and if there is an inherently longer time to return due to the contact nature of the sport.

Limitations

Several limitations may impact this study's findings. All ACL injuries, along with the date of surgery and the severity of the injury, were reported through media outlets, without access to medical records, patient charts, or operative reports. Additionally, our usage of publicly available data may lead to the exclusion of athletes who experienced ACL injury and reconstruction whose data were not reported. Although we validated the presence of ACL injuries and surgeries through 2 separate and reputable media sources, the lack of medical records may limit the accuracy of the reported injury, diagnosis, and operation. Further, details regarding prior injuries or surgeries, concomitant pathology at the time of ACL, intraoperative graft choices, and rehabilitation differences are difficult to

discern and may act as potential confounders that prevent the present study from determining causality. As noted by Ross et al.,[15] having access to short-term and long-term follow-up clinical data would be helpful to verify the accuracy of postoperative diagnoses and evaluate the relative effect that respective injuries may incur in an athlete's future competitions. Ross et al.[15] discuss that in light of the limitations associated with using publicly available resources without clinical data, athletes and professionals would benefit from a national injury database with standardized reporting protocols.

Another major limitation to this study and other similar investigations that use uninjured athletes as controls is that these control athletes cannot serve as perfect controls as a comparison to injured athletes. Although we attempted to match fighters on the basis of height, weight, reach, birth year, age at first fight, and preindex win percentage, these efforts cannot completely account for the sport's immense range of skill level, fight schedules, combat styles, anatomic differences, and training/rehabilitation resource access that all contribute to fighters' performance and career trajectory.

An additional constraint specific to the UFC, as opposed to the NBA, NFL, or MLB, is the number of fights throughout a career, which is minimal compared to other sports. Professional athletes in other sports may play hundreds of games in both the preindex and postindex periods of their careers. However, the average career length of UFC fighters who underwent ACLR and their controls was roughly 14 fights, which limits the robustness of the data. Similarly, because there appear to be fewer athletes and ACLRs in the UFC compared to other professional sports leagues, our sample size was only 27 fighters, which limits the generalizability of the study. The broad spectrum of fighting styles, injury histories, and levels of experience may not be fully captured by this study's sample size.

Furthermore, another limitation of this study is that it does not feature metrics such as thigh muscle power and a knee functional score to objectively quantify functional recovery in UFC fighters who underwent ACLR. Considering our lack of access to these metrics, we relied on offensive and defensive statistics, such as the accuracy of strikes landed and evaded and submission attempts to demonstrate functional recovery. While these measures are also influenced by a collective of factors such as upper limb strength, spine health, aging, and cognition, knee functionality remains a crucial contributor to a fighter's fighting capacity in this grappling and striking-based sport. Agility, lower-body stability, abrupt deceleration, sharp pivoting, and explosive movements, which are all heavily reliant on a functional ACL, are paramount to a fighter's ability to land and evade strikes. However, rather than relying solely on match statistics, future investigations should consider utilizing video analysis to elucidate how specific biomechanical parameters such as strike velocity and reaction time are impacted following ACLR, in addition to measuring thigh muscle power and calculating a knee functional score.

Conclusions

In this study, we found that most UFC fighters who undergo ACLR return to sport for at least 1 fight; however, just over half return for at least 2 fights. There was not a significant difference in career length between fighters who returned to sport following ACLR for at least 2 fights and their controls. Defensive performance, but not offensive performance, declined significantly following ACLR. All fighters demonstrated significant declines in their win percentage as their career progressed, irrespective of ACLR.

Disclosures

All authors (J.S.G., H.W.D., T.W., N.A.A-K., L.S.K., N.M.) declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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