Return to Play and Player Performance After Achilles Tendon Rupture in UEFA Professional Soccer Players

A Matched-Cohort Analysis of Players From 1999 to 2018

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Background: Achilles tendon rupture (ATR) is a potentially career-ending injury in professional athletes. Limited information exists regarding return to play (RTP) in professional soccer players after this injury.

Purpose: To determine the RTP rate and time in professional soccer players after ATR and to evaluate player performance relative to matched controls.

Study Design: Cohort study; Level of evidence, 3.

Methods: We evaluated 132 professional soccer players who suffered an ATR between 1999 and 2018. These athletes were matched 2:1 to uninjured controls by position, age, season of injury, seasons played, and height. We collected information on the date of injury, the date of RTP, and player performance metrics (minutes played, games played, goals scored, assists made, and points per game) from official team websites, public injury reports, and press releases. Changes in performance metrics for the 4 years after the season of injury were compared with metrics 1 season before injury. Univariate comparisons were performed using independent-sample, 2-group t tests and Wilcoxon rank-sum tests when normality of distributions was violated.

Results: The mean age at ATR was 27.49 ± 4.06 years, and the mean time to RTP was 5.07 ± 2.61 months (18.19 ± 10.96 games). The RTP rate was 71% for the season after injury and 78% for return at any timepoint. Overall, 9% of the injured players experienced a rerupture during the study period. Compared with controls, the injured players played significantly less (-6.77 vs -1.81 games [P < .001] and -560.17 vs -171.17 minutes [P < .05]) and recorded fewer goals (-1.06 vs -0.29 [P < .05]) and assists (-0.76 vs -0.02 [P < .05]) during the season of their Achilles rupture. With the exception of midfielders, there were no significant differences in play time or performance metrics between injured and uninjured players at any postinjury timepoint.

Conclusion: Soccer players who suffered an ATR had a 78% RTP rate, with a mean RTP time of 5 months. Injured players played less and demonstrated inferior performance during the season of injury. The exception of midfielders, players displayed no significant differences in play time or performance during any of the 4 postinjury seasons.

Keywords: soccer; player performance; return to play; Achilles tendon rupture; Union of European Football Associations

Achilles tendon rupture (ATR) is an infrequent injury that can be detrimental to a patient’s quality of life and ability to return to play (RTP). ATRs most frequently occur in middle-aged men during a sudden increase in high-intensity jumping and running after periods of relative deconditioning. Incidences among the general population have been reported to range from 4.7 to 24 per 100,000, with a consistent upward trend over a 15-year period. The radiostereometric analysis as well as biomechanical investigations after recovery from ATR have identified inferior elastic properties in the healed Achilles tendon as well as persistently decreased muscle strength and endurance at up to 12 months after surgical repair. Functionally, athletes have been found to develop compensatory running mechanics after ATR, indirectly increasing the risks of subsequent knee injuries. While the injury is common among “weekend warriors,” professional athletes are similarly at risk because of the serious ramifications of ATRs on RTP. Previous studies have shown ATRs to have devastating consequences on...
performance metrics in professional basketball, American football, baseball, and hockey players. However, the performance data for RTP after ATRs in professional soccer remains sparse. In a study of the Union of the European Football Association (UEFA) Champions League, Gajhede-Knudsen et al found the incidence of Achilles tendinopathy to be 0.18 injuries per 1000 hours and the incidence of ATR to be 0.01 per 1000 hours, with ATRs resulting in 161 ± 65 days of lost playing time. The authors did not investigate performance metrics as an outcome of interest, despite evidence of long-term healing.

With the increased participation in professional soccer both globally and in the United States, it is important to assess the impact of ATRs on athletes’ performance after RTP. The purpose of this investigation was to determine the timing and the rate of RTP among elite professional soccer players and to compare the performance metrics of players after RTP from ATRs with those of matched, uninjured controls. We hypothesized that the rate of RTP after ATR would be low relative to other lower extremity injuries requiring surgical intervention, including anterior cruciate ligament rupture. Furthermore, we hypothesized that players who did RTP, performance metrics would be comparable with uninjured controls by 2 seasons after their injury.

METHODS
This was a retrospective cohort study of male soccer players with an ATR. Players from the 5 major European soccer leagues (English Premier League, Bundesliga, Serie A, La Liga, and Ligue 1) from 1999 to 2018 were included. Injured and control players were identified using publicly available sources, including transfermarkt.co.uk, uefa.com, fifa.com, official team websites, public injury reports, and press releases, via methods established in previous investigations. Injuries and player performance data were manually cross-referenced by 2 authors (E.M.F. and O.Z.L.-G.) via official league injury reports. A player was included in the study if he was drafted or signed to a team in 1 of the 5 abovementioned soccer leagues, participated in at least 1 game in the season before sustaining an ATR, and had a minimum of 1 year follow-up after injury. Demographic data for each player, including age, height, position, and number of seasons played, were recorded. Injury and RTP data were documented, including the date of injury, days/games missed, the date of RTP, and subsequent injuries. Finally, we collected performance metrics, including games played, minutes played per game and per season, goals scored, assists, shutouts, and conceded goals.

A matched-cohort analysis was completed to compare performance metrics of injured players to their uninjured matched controls. A representative group of soccer players who had not sustained an ATR were identified and matched to injured players in a 2:1 fashion (ie, 2 controls for each injury case) using the optimized matching methodology of King et al. Players with any other lower extremity injury were excluded from the control group. Players were matched by position, height, ±2 years of age, ±1 season year, and ±1 year of seasons played within the league.

Changes in performance metrics for 1, 2, 3, and 4 years after the index year were compared with metrics 1 season before the index year. Comparison of metrics with the previous year minimized the confounding effect of missed game time on season performance in the injured cohort. Performance changes at the various postinjury timepoints were compared between the injured and the matched control group by position to account for the differing roles of player positions on the field. Injury history data were summarized as means and standard deviations. All other continuous data were summarized as medians and interquartile ranges (IQRs). Univariate 2-group comparisons were performed using independent-sample, 2-group t tests and Wilcoxon rank-sum tests when normality distributions were violated. Chi-square tests were used to compare categorical data. All analyses were performed using R Studio software Version 3.6.2 (R Foundation for Statistical Computing). Statistical significance was set at P < .05.

RESULTS
Characteristics and RTP
We identified 132 soccer players (mean age, 27.49 ± 4.06 years) who suffered an ATR between 1999 and 2018. A total of 79,497 player-years were identified during the 19 seasons included in this study. During each season an athlete who contributed to a team within the top 5 European leagues was counted as a player-year. This investigation found an incidence of 1.66 ATRs per 1000 player-years. Demographic and RTP characteristics for injured players and uninjured controls are presented in Table 1.

Two matched controls were identified for each injured player. No baseline differences were found on any parameter examined between each group’s respective index season. The mean RTP time was 5.07 ± 2.61 months (18.19 ± 10.96 games). Of the injured players, 103 (78%) players returned to play

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in 1 of the 5 major European soccer leagues after ATR. The majority (71%) of these players returned the season after their injury, with an additional 7% and 2% returning to play their second and third season after injury, respectively (Table 2). When evaluating by field position, RTP rates were 64.4% midfielders, 70% defenders, and 75.9% attackers. Significantly fewer midfielders returned to play compared with other positions (P = .0005). Of the 132 players with ATR, 10 (9%) experienced a retear during the study period.

Play Time and Player Performance

Soccer players with ATR played significantly fewer games (-6.77 vs -1.81 games; P < .001) and minutes (-560.17 vs -171.17 minutes; P < .05) during their season of injury relative to matched controls (Appendix Table A1). There were no significant differences in these metrics between injured and uninjured controls during any of the postinjury seasons. There were no significant differences in the number of minutes played per game between injured and uninjured soccer players at any timepoint.

Injured players scored significantly fewer goals (-1.06 vs -0.29 goals; P < .05) and made significantly fewer assists (-0.76 vs -0.02 assists; P < .05) during the season of their Achilles rupture. While injured players continued to score fewer goals and make fewer assists in the 4 seasons after their injury compared with controls, none of these differences were statistically significant, and there were no statistically significant differences in points per game between injured and uninjured players at any timepoint.

**Player Position**

**Attackers.** A total of 29 attackers were identified as having suffered an ATR. Games and minutes played per season as well as minutes played per game were not significantly different from controls during any of the seasons (Appendix Table A2). With respect to player performance, while injured attackers scored fewer goals per season and points per game compared with their matched controls for all 4 postinjury seasons, none of these differences were statistically significant. Likewise, although injured attackers recorded fewer assists for the first 3 postinjury seasons, the differences were not significant.

**Midfielders.** Midfielders accounted for 45 players identified as suffering an ATR. Injured midfielders played significantly fewer games (-9.82 vs -2.22 games; P < .05) and minutes (-875.71 vs -233.15 minutes; P < .05) per season during the season of their injury relative to their matched controls (Appendix Table A3). Injured midfielders continued to play fewer games per season than their uninjured controls during the 4 postinjury seasons, but this difference was only significant during their first postinjury season (P < .05). Similarly, injured players recorded fewer minutes per season during the 4 postinjury seasons, but none of these differences were statistically significant. With respect to player performance, injured midfielders recorded fewer assists per season and points per game during their season of injury and the subsequent 4 seasons; however, none of these differences were statistically significant.

**Defenders.** A total of 53 defenders with an ATR were identified. Injured defenders played fewer games per season, minutes per season, and minutes per game during the season of their injury and their first postinjury season, but these differences were not statistically significant from controls (Appendix Table A4). By the second postinjury season, injured players had recorded more games per season, minutes per season, and minutes per game than their matched controls; however, these differences were not statistically significant. Injured defenders scored significantly fewer goals per season during their first (-0.48 vs 0.09 goals; P < .05) and second (-0.57 vs -0.06 goals; P < .05) postinjury seasons. There were no significant differences in goals scored for any other seasons. While injured defenders made fewer assists during the season of injury and their first postinjury season, there were no significant differences in assists or points per game between injured and uninjured defenders at any timepoint.

**Goalkeepers.** Five goalkeepers with an ATR were identified. There were no significant differences in games and minutes played per season or minutes played per game between injured and uninjured goalkeepers at any timepoint (Appendix Table A5). Injured goalkeepers recorded fewer clean sheets per season during their season of injury.

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**TABLE 1**

Cohort Characteristics *a*

| Variable                      | Controls (n = 254) | Achilles Rupture (n = 132) | P Value |
|-------------------------------|-------------------|-----------------------------|---------|
| Player position, n            |                   |                             | ≥ .999  |
| Attacker                      | 58                | 29                          |         |
| Midfielder                    | 90                | 45                          |         |
| Defender                      | 106               | 53                          |         |
| Goalkeeper                    | 0                 | 5                           |         |
| Calendar year of season       | 2011 ± 4.49       | 2012 ± 3.83                 | ≥ .999  |
| Total years played in league  | 6.42 ± 3.71       | 8.23 ± 4.82                 | ≥ .999  |
| Height, m                     | 1.82 ± 0.04       | 1.81 ± 0.06                 | .980    |
| Age during season             | 27.29 ± 4.37      | 27.49 ± 4.06                | .997    |

*Data are reported as mean ± SD or n.

**TABLE 2**

RTP Metrics *a*

| Variable                      | Value          |
|-------------------------------|----------------|
| Months missed                 | 5.07 ± 2.61    |
| Games missed                  | 18.19 ± 10.96  |
| Number of reinjuries          | 10 (9)         |
| RTP at any timepoint          | 103 (78)       |
| 1 season after injury         | 94 (71)        |
| 2 seasons after Injury        | 101 (77)       |
| 3 seasons after injury        | 103 (78)       |
| 4 seasons after injury        | 103 (78)       |

*Data are reported as mean ± SD or n (%). RTP, return to play.
DISCUSSION

The principal findings of this study were as follows: (1) the mean age at ATR was 27.49 ± 4.06 years; (2) the mean RTP was 5.07 ± 2.61 months; (3) the RTP rate was 71% for returning the season after injury and 78% for returning at any timepoint; (4) 9% of players experiencing ATR experienced a rerupture during the study period; (5) compared with uninjured controls, the injured players played significantly fewer games (-6.77 vs -1.81 games; \( P < .001 \)) and minutes (-560.17 vs -171.17 minutes; \( P < .05 \)), and recorded fewer goals (-1.06 vs -0.29 goals; \( P < .05 \)) and assists (-0.76 vs -0.02 assists; \( P < .05 \)) during the season of their Achilles rupture; and (6) with the exception of midfielders, there were no significant differences in play time or performance metrics at any postinjury timepoint between uninjured players and injured players who returned to play.

The mean RTP time in this study was 5.07 months, which substantiates the findings of previous investigations that ATR results in significant loss of play time. The mean layoff after ATR has been reported to be 161 days among professional soccer players returning from Achilles rupture; and (6) with the exception of midfielders, there were no significant differences in play time or performance metrics at any postinjury timepoint between uninjured players and injured players who returned to play. Interestingly, 1 investigation found shorter recovery periods to be significantly associated with reinjury, highlighting the importance of adhering to rehabilitation timelines to allow adequate healing of the repair.\(^{10}\)

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This investigation found that almost 10% of players experiencing a primary ATR sustained a rerupture at some point during the study period (median, 3 years; IQR, 2.25-3.75 years). Significant rerupture rates have been reported among professional soccer players returning from Achilles rupture. Grassi et al\(^{11}\) reported that 8% of soccer players suffered rerupture within their first 2 seasons after returning to play. Interestingly, 1 investigation found shorter recovery periods to be significantly associated with reinjury, highlighting the importance of adhering to rehabilitation timelines to allow adequate healing of the repair.\(^{10}\)

The present investigation found the mean age of ATR among professional soccer players to be 27.49 years. This is consistent with previous studies that have examined similar but smaller cohorts.\(^{10}\) The mean age of UEFA Champions League players has ranged from 24.9 to 26.5 years, notably younger than the mean age of players sustaining an ATR.\(^{15}\) In their investigation of NBA, NFL, and MLB players, Trofa et al\(^{35}\) found that athletes who sustained ATR were, on average, 2.7 years older than the average professional athlete. Soccer players typical peak between ages 25 and 27 years, evidenced by the performance decline in matched controls.\(^{2}\) As such, players sustaining an ATR are often entering the latter portion of their careers before injury. This finding is likely related to the underlying pathogenesis of ATR, which requires both underlying tendinosis and a forceful eccentric contraction.\(^{4}\)

Achilles tendinosis is common among professional soccer players, and its incidence increases with age, which may account for this result.\(^{12,13,36}\)

The present study found that soccer players sustaining an ATR played significantly fewer games and minutes during the season of their injury relative to their matched controls. Similarly, we found that injured players recorded significantly fewer goals and assists relative to matched controls during their season of injury. These findings are fairly intuitive, as ATR precludes players from participating in the remainder of the season, thus limiting their play time and ability to record goals and assists. Before injury, athletes in the ATR and control cohorts contributed nearly equal minutes per game, suggesting the absence of prodromal symptoms before ATR. Importantly, with the exception of midfielders, who played significantly fewer games during their first postinjury season, there were no significant differences in play time or performance metrics at any postinjury timepoint between uninjured players and injured players who had returned to play. This finding contrasts somewhat with the results of Trofa et al,\(^{36}\) who reported no significant differences in player performance at any postinjury timepoint but found persistently decreased play time at 2 years postinjury. However, these authors performed a relatively small matched-cohort analysis of 24 American and European soccer players who underwent Achilles tendon repair from 1988 to 2014. The inclusion of players who underwent surgical repair in 1988, when advanced rehabilitation protocols and minimally invasive surgical techniques were not yet implemented, may have influenced their results.

The results of this investigation support the findings of previous studies that among elite soccer athletes, ATR is a serious, potentially career-ending injury that tends to affect older athletes. While those older athletes who suffer an ATR may be less incentivized to undergo the rigorous rehabilitation process required to return to their sport, those who do decide to return demonstrate excellent play time and performance metrics upon their return.

Limitations

An important limitation to consider when interpreting the presented results include the use of public data sources in generating the ATR player cohort. This lends the possibility of a selection bias toward players with publicly reported injuries while not capturing information on injuries players...
sustain that remain undisclosed to the public. This limitation is minimized in the context of investigating ATR because of the prolonged rehabilitation necessary after injury and thus low likelihood of a player's reason for absence remaining undisclosed to the public. Additionally, it was not possible to note any differences in surgical treatment (ie, standard open vs percutaneous vs minimally invasive) and rehabilitation without access to official medical record documentation. Finally, creating matched cohorts for elite athletes poses the challenge of maximizing similarities in player characteristics within a relatively small and fixed number of players. Prior investigations have relied on either manual selection of players or matching of calculated propensity scores to generate matched cohorts. Manual matching imparts a significantly elevated risk of selection bias, whereas use of an aggregated propensity score imparts the significant limitation of generating higher levels of imbalance, thus skewing and potentially masking the effects of statistical models calculated.16-18

To minimize these potential risks of bias associated with matching, we used a method that optimizes the matching solution for a given data set and thus minimizes the imbalances within each group that are otherwise unaccounted for with manual and propensity score matching. The matching method did not control for baseline performance metrics between groups or contract status, which may affect teams' personnel decision making. Because of the inclusion criteria and the inherent limitations of utilizing public data sources, a relatively small size of athletes was identified, potentially confounding the results reported in this investigation and emphasizing the need for a centralized UEFA medical database to more accurately identify correlations between athlete performance and ATR. The fate of athletes who did not return to the same level of competition, along with the associated reasons for being unable to RTP, was also rarely reported. The impact of additional athlete-related and team-based variables on time lost, RTP timing, and performance metrics in athletes sustaining ATR were not recorded and thus cannot be inferred based on the current data.

CONCLUSION

In the current study, 78% of the elite, professional European League soccer players suffering an ATR returned to play at any timepoint, with a mean RTP of 5 months. Injured players played less and demonstrated inferior player performance during their season of injury. With the exception of midfielders, injured and uninjured players displayed no significant differences in play time or performance during any of the 4 postinjury seasons.

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### APPENDIX

**APPENDIX TABLE A1**

| Player Metrics | Control | Achilles Rupture | Value |
|----------------|---------|------------------|-------|
| Games per season | | | |
| Index year | -1.81 ± 11.12 | -6.77 ± 11.62 | <.001 |
| 1 year post | -2.28 ± 12.39 | -5.12 ± 11.76 | .156 |
| 2 years post | -5.28 ± 14.14 | -5.28 ± 12.15 | .743 |
| 3 years post | -5.04 ± 15.46 | -5.26 ± 11.45 | .953 |
| 4 years post | -3.16 ± 17.24 | -2.50 ± 14.05 | .927 |
| Minutes per season | | | |
| Index year | -171.17 ± 985.52 | -560.17 ± 1014.89 | <.05 |
| 1 year post | -250.71 ± 1110.80 | -474.04 ± 1027.80 | .213 |
| 2 years post | -495.14 ± 1280.86 | -512.49 ± 1075.39 | .747 |
| 3 years post | -348.52 ± 1375.30 | -493.76 ± 1121.19 | .690 |
| 4 years post | -165 ± 1667.94 | -148.67 ± 1209.85 | .893 |
| Minutes per game | | | |
| Index year | -2.35 ± 26.65 | -5.57 ± 27.70 | .548 |
| 1 year post | 1.12 ± 24.46 | -8.11 ± 34.09 | .129 |
| 2 years post | -4 ± 26.60 | -6.64 ± 26.76 | .774 |
| 3 years post | -5.03 ± 34.70 | -1.27 ± 33.91 | .618 |
| 4 years post | 3.17 ± 23.67 | 4.71 ± 35.87 | .822 |
| Goals per season | | | |
| Index year | -0.29 ± 3.10 | -1.06 ± 3.22 | <.05 |

(continued)
### APPENDIX TABLE A2
Attacker Metrics Compared With 1 Year Before Index Year\(^a\)

| Player Metrics\(^b\) | Control       | Achilles Rupture | Value |
|-----------------------|---------------|------------------|-------|
| **Games per season**  |               |                  |       |
| Index year            | -0.75 ± 12.20 | -5.21 ± 14.52    | .266  |
| 1 year post           | -2.87 ± 13.37 | 2.83 ± 14.50     | .906  |
| 2 years post          | -8.47 ± 13.40 | -2.54 ± 12.71    | .854  |
| 3 years post          | -5.75 ± 16.74 | -1.71 ± 7.70     | .643  |
| 4 years post          | -7 ± 21.21    | -3 ± 18.46       | .800  |
| **Minutes per game**  |               |                  |       |
| Index year            | -104.78 ± 967.46 | -313.63 ± 1119.39 | .444  |
| 1 year post           | -274.35 ± 1118.31 | -369.17 ± 1036.21 | .805  |
| 2 years post          | -515.87 ± 1013  | -410.77 ± 959.34 | .854  |
| 3 years post          | -414.12 ± 1543.63 | -118.14 ± 848.88 | .613  |
| 4 years post          | 0.50 ± 2297.39 | -132.50 ± 1668.71 | ≥.999 |
| **Goals per season**  |               |                  |       |
| Index year            | -4.43 ± 22.27  | 3.84 ± 24.48     | .103  |
| 1 year post           | -1.98 ± 24.26  | -8.05 ± 31.27    | .706  |
| 2 years post          | -3.27 ± 19.42  | -11.33 ± 30.82   | .467  |
| 3 years post          | -12.30 ± 35.45 | 7.81 ± 21.77     | .232  |
| 4 years post          | 16.60 ± 40.65  | -3.18 ± 40.82    | .800  |
| **Assists per season**|               |                  |       |
| Index year            | -0.62 ± 5.45   | -2 ± 6.02        | .283  |
| 1 year post           | -1.52 ± 5.57   | -2.28 ± 5.40     | .712  |
| 2 years post          | -2.87 ± 5.69   | -3.54 ± 6.01     | .945  |
| 3 years post          | -0.25 ± 6.32   | -2.00 ± 6.45     | .728  |
| 4 years post          | 1.50 ± 4.95    | -5.50 ± 7.94     | .533  |

\(^a\)Data are presented as mean ± SD. Post, postindex year.

### APPENDIX TABLE A3
Midfielder Metrics Compared With 1 Year Before Index Year\(^a\)

| Player Metrics\(^b\) | Control       | Achilles Rupture | Value |
|-----------------------|---------------|------------------|-------|
| **Games per season**  |               |                  |       |
| Index year            | -2.22 ± 10.17 | -9.82 ± 9.55     | <.05  |
| 1 year post           | 0.60 ± 11.25  | -6.05 ± 1.1      | <.05  |
| 2 years post          | -5.79 ± 16.45 | -9.24 ± 10.24    | .799  |
| 3 years post          | -10.23 ± 15.82| -14.17 ± 9.13    | .327  |
| 4 years post          | -9.67 ± 12.10 | -17 ± 5.66       | .800  |
| **Minutes per game**  |               |                  |       |
| Index year            | -233.15 ± 940.03 | -875.71 ± 876.28 | <.05  |
| 1 year post           | -75.72 ± 1096.36 | -468.45 ± 1075.11 | .181  |
| 2 years post          | -543.79 ± 1590.41 | -791.24 ± 1057.81 | .925  |
| 3 years post          | -685.15 ± 1374.15 | -1377.08 ± 931.56 | .168  |
| 4 years post          | -878.33 ± 1791.67 | -1333 ± 86.27    | .600  |
| **Goals per season**  |               |                  |       |
| Index year            | -4.52 ± 23.45 | -11.85 ± 20.52   | .159  |
| 1 year post           | 1.01 ± 23.44  | -8.10 ± 30.47    | .216  |
| 2 years post          | -9.38 ± 37.81 | -5.19 ± 23.09    | .490  |
| 3 years post          | -12.21 ± 46.11| -23.01 ± 31.70   | .470  |
| 4 years post          | -5.53 ± 46.40 | 1.21 ± 23.33     | ≥.999 |
| **Assists per season**|               |                  |       |
| Index year            | -0.34 ± 2.38  | -1.50 ± 2.40     | .087  |
| 1 year post           | -0.48 ± 2.77  | -0.25 ± 3.34     | .749  |
| 2 years post          | -0.74 ± 3.89  | -0.88 ± 2.09     | .936  |
| 3 years post          | -1.69 ± 3.86  | -2.33 ± 2.67     | .337  |
| 4 years post          | 0 ± 1.73      | 0.50 ± 0.71      | ≥.999 |

\(^a\)Data are presented as mean ± SD. Bolded P values indicate statistically significant differences between groups (P < .05). Post, postindex year.

\(^b\)Change in player performance metric as compared with 1 year before the index year (ie, timepoint of injury for players with Achilles tendon rupture and index year for matched controls).
### Defender Metrics Compared With 1 Year

**Before Index Year**

| Player Metrics | Control | Achilles Rupture | Value |
|----------------|---------|------------------|-------|
| **Games per season** | | | |
| Index year | -2.39 ± 11.27 | -6.29 ± 9.73 | .102 |
| 1 year post | -3.67 ± 12.76 | -5.39 ± 10.39 | .502 |
| 2 years post | -6.23 ± 13.40 | -2.76 ± 11.86 | .249 |
| 3 years post | -3.13 ± 14.74 | -0.15 ± 11.39 | .458 |
| 4 years post | -4.17 ± 18.24 | -0.18 ± 13.38 | .644 |
| **Minutes per game** | | | |
| Index year | -195.60 ± 1042.69 | -532.58 ± 891.26 | .181 |
| 1 year post | -344.95 ± 1153.24 | -502.09 ± 988.51 | .575 |
| 2 years post | -553.09 ± 1226.27 | -261.48 ± 1061.66 | .257 |
| 3 years post | -241.48 ± 1345.52 | 9.77 ± 1038.72 | .515 |
| 4 years post | -293.50 ± 1677.02 | 26.82 ± 1150.54 | .566 |
| **Goals per season** | | | |
| Index year | 0.88 ± 29.41 | -6.62 ± 28.27 | .523 |
| 1 year post | 2.77 ± 26.11 | -6.96 ± 31.01 | .218 |
| 2 years post | -1.86 ± 23.24 | -1.26 ± 21.67 | .960 |
| 3 years post | 0.77 ± 28.47 | 0.37 ± 13.70 | .673 |
| 4 years post | 2.91 ± 17.91 | 1.83 ± 33.20 | .695 |
| **Assists per season** | | | |
| Index year | -0.10 ± 1.21 | -0.39 ± 1.37 | .363 |
| 1 year post | 0.09 ± 1.19 | -0.48 ± 1.18 | <.05 |
| 2 years post | -0.06 ± 1.63 | -0.57 ± 0.93 | <.05 |
| 3 years post | 0.09 ± 1.28 | 0.15 ± 1.68 | .973 |
| 4 years post | -0.25 ± 2.01 | -0.18 ± 1.33 | ≥.999 |
| **Points per game** | | | |
| Index year | -0.06 ± 1.15 | -0.61 ± 1.55 | .092 |
| 1 year post | 0.16 ± 1.72 | -0.42 ± 2.09 | .178 |
| 2 years post | -0.11 ± 1.49 | 0.19 ± 2.23 | .629 |
| 3 years post | 0.04 ± 1.87 | 0.85 ± 3.63 | .774 |
| 4 years post | 0.58 ± 1.08 | -0.18 ± 1.80 | .196 |

### Goalkeeper Metrics Compared With 1 Year

**Before Index Year**

| Player Metrics | Control | Achilles Rupture | Value |
|----------------|---------|------------------|-------|
| **Games per season** | | | |
| Index year | -1.81 ± 11.12 | -6.77 ± 11.62 | ≥.999 |
| 1 year post | -2.28 ± 12.39 | -5.12 ± 11.76 | ≥.999 |
| 2 years post | -5.28 ± 14.14 | -5.28 ± 12.15 | .400 |
| 3 years post | -5.04 ± 15.46 | -5.26 ± 11.45 | ≥.999 |
| 4 years post | -3.16 ± 17.24 | -2.50 ± 14.05 | .667 |
| **Minutes per game** | | | |
| Index year | 239.75 ± 688.16 | 60.40 ± 1809.36 | .806 |
| 1 year post | -140 ± 333.75 | -742.50 ± 1434.60 | ≥.999 |
| 2 years post | 592.67 ± 932.88 | -1440 ± 2036.47 | .400 |
| 3 years post | 871 ± 1096.02 | 218.50 ± 72.83 | ≥.999 |
| 4 years post | 1510.50 ± 218.50 | 225 ± 5 | .667 |
| **Clean sheets per season** | | | |
| Index year | 1.76 ± 44.58 | 1.95 ± 57.94 | .901 |
| 1 year post | 2.76 ± 4.58 | -17.95 ± 82.76 | .800 |
| 2 years post | 1.33 ± 4.06 | -45 ± 63.64 | .800 |
| 3 years post | 4.05 ± 2.75 | 86.75 ± 4.60 | .333 |
| 4 years post | 4.32 ± 2.37 | 75 ± 5 | .667 |
| **Conceded goals per season** | | | |
| Index year | 1.50 ± 12.45 | 0.60 ± 27.43 | ≥.999 |
| 1 year post | 0 ± 2 | -10.25 ± 21.96 | .475 |
| 2 years post | 4.33 ± 11.59 | -21.50 ± 30.41 | .400 |
| 3 years post | 14 ± 19.80 | 6.50 ± 2.12 | ≥.999 |
| 4 years post | 25.50 ± 2.12 | 7 ± 0 | .667 |

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*Data are presented as mean ± SD. Bolded P values indicate statistically significant differences between groups (P < .05). Post, postindex year.*

*Change in player performance metric as compared with 1 year before the index year (ie, timepoint of injury for players with Achilles tendon rupture and index year for matched controls).*