Bilateral Achilles Tendon Ruptures in the NFL
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Introduction/Purpose: Achilles tendon ruptures (ATR) can have devastating results for athletes in the National Football League (NFL). Although NFL athletes who suffer an ATR are successfully treated with surgery and rehabilitation, this potentially career-ending injury has demonstrated a decrease in return to play, playing time, and performance for athletes. With a mean career length of 3.3 years for NFL athletes, the ATR injury and subsequent 9 to 11 month rehabilitation period could adversely limit the impact athletes make both individually and at the team level. Although previous research has examined the effects of a unilateral ATR in athletes, the purpose of this study was to determine the effects of bilateral ATRs on the health, productivity, and career longevity of NFL athletes.

Methods: Publicly available online injury data for NFL athletes who sustained bilateral ATRs between the start of the 2007 season and the start of the 2021 season were queried using online news and sports analysis web sources. Inclusion criteria consisted of NFL athletes who sustained two independent, contralateral ATRs and exclusion criteria were NFL athletes who only sustained a single ATR or athletes who subsequently reinjured the same tendon. Specific dates for the first ATR (ATR1), return to play after ATR1, second ATR (ATR2), return to play after ATR2, as well as most recent game played were recorded. NFL preseason, regular season, and postseason (playoff, wild card, Pro Bowl, and Super Bowl) games were used to tabulate the total number of games missed or played. Descriptive and univariate statistics were performed.

Results: When analyzing five NFL athletes with bilateral ATRs, mean BMI was 33.4+-4, an average of 5.8+-4 seasons were completed before ATR1, and three athletes currently play. There was a significant decrease in Pro Bowl nominations with each successive ATR (p=0.027). A significant difference was observed for mean age at tendon rupture when comparing ATR1 and ATR2 (27.8+-4 vs 30.4+-4 years, p<0.01). Rehabilitation periods after ATR1 and ATR2 (9.3+-2 vs.10.9+-2 months), as well as number of games missed during rehabilitation periods for ATR1 and ATR2 (9.8+-4 vs.12.8+-6) were not significantly different. The mean time period after returning from ATR2 was 22.0+-16 months, with a mean number of 39.3+-24 games played (Table 1). When analyzing performance metrics of four defensive NFL athletes, forced fumbles was the only defensive metric that significantly changed across successive Achilles injuries (p=0.02).

Conclusion: This case series investigated NFL athletes who sustained bilateral ATRs, demonstrating a significant difference in age at the time of each rupture along with a decreasing trend in the number of Pro Bowl nominations following successive Achilles injuries. Upon analyzing defensive NFL athletes, forced fumbles was the only performance metric that significantly changed across successive Achilles injuries. This case series is the first study to review the effect of bilateral ATRs in NFL athlete performance and further research should be conducted to continue analyzing how these injuries affect the health, productivity, and career longevity of NFL athletes.
| NFL Player | Player 1 | Player 2** | Player 3 | Player 4 | Player 5 | Mean±SD | P-Value |
|------------|---------|-----------|---------|---------|---------|---------|---------|
| ATR1 Laterality | Right | Left | Left | Right | Right | - | - |
| ATR2 Laterality | Left | Right | Right | Left | Left | - | - |
| Age at ATR1 | 29 | 22 | 26 | 30 | 32 | 27.8±4 | <0.01 |
| Age at ATR2 | 30 | 25 | 30 | 33 | 34 | 30.4±4 | <0.01 |
| ATR1 Rehabilitation Time (Months) | 7.8 | 11.4 | 10.1 | 5.8 | 11.4 | 9.3±2 | |
| ATR2 Rehabilitation Time (Months) | 13.5 | 10.6 | 10 | 11.6 | 8.7 | 10.9±2 | 0.42 |
| Games Missed During ATR1 Rehabilitation | 4 | 9 | 10 | 11 | 15 | 9.8±4 | |
| Games Missed During ATR2 Rehabilitation | 17 | 16 | 9 | 17 | 5 | 12.8±6 | 0.49 |
| Time between RTP1 and ATR2 (Months) | 9.5 | 38.3 | 39.2 | 35.3 | 16 | 27.6±14 | |
| Time between RTP2 and Most Recent Game Played (Months) | -* | 28.3 | 4.2 | 41.8 | 13.8 | 22.0±16 | - |
| Games Played between RTP1 and ATR2 | 16 | 53 | 63 | 51 | 37 | 44.0±18 | |
| Games Played between RTP2 and Most Recent Game Played | -* | 52 | 15 | 66 | 24 | 39.3±24 | - |
| Time between ATR1 and ATR2 (Months) | 17.3 | 49.8 | 49.3 | 41.1 | 27.4 | 37.0±14 | - |

National Football League (NFL); Achilles Tendon Rupture 1 (ATR1); Return to Play 1 (RTP1); Achilles Tendon Rupture 2 (ATR2); Return to Play 2 (RTP2); Standard Deviation (SD)

*Player 1 has returned to play and is active on the roster status, but has not played a game during the time of data abstraction

**Player 2 suffered ATR1 during a college football season