# Return-to-Sport Rate for NFL Tight Ends after ACL/MCL Tears

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## Abstract

An anterior cruciate ligament (ACL), located on the inside of the knee joint and connects the shin to the thigh, and the Medial Collateral Tears (MCL), located on the inner side of the knee and allows sideways motion, are prevalent injuries in the NFL, posing significant challenges to athletes. Tight ends are especially susceptible to ACL and MCL tears, given the demands of their position, potentially jeopardizing their longevity in the NFL and the quality of their careers. This study investigates the impact of ACL or MCL tear recovery on career length and performance for NFL tight ends. Data was used from 2010 to 2022. T-test results indicate no significant drop in performance for tight ends who suffer an ACL or MCL tear and return to play. Additionally, we did not observe any significant change in career length between players who have sustained an ACL or MCL tear and those who have not.

## Introduction and Background

An anterior cruciate ligament (ACL) and medial collateral ligament (MCL) tears are prevalent injuries in the NFL, posing significant challenges to athletes. Given their demanding playing positions, tight ends are particularly susceptible to ACL or MCL tears. As receivers and linemen, tight ends have to participate in sharp turns, making them more prone to these injuries.

Most studies have looked at skilled positions like quarterback, running back, and wide receiver. Therefore, the information regarding tight ends is limited. These injuries not only jeopardize the immediate playing ability of these athletes but also raise concerns about the longevity and quality of their careers. Effective recovery strategies are crucial to ensure tight ends can return to peak performance following such injuries. In this study, we aim to investigate the impact of ACL or MCL tear recovery on tight ends in the NFL, with a specific focus on evaluating career length and performance outcomes.

## Methods and Data

To assess the effectiveness of ACL or MCL tear recovery, we employed t-tests as a statistical tool to analyze relevant data. The tests were crucial in determining whether the recovery interventions significantly impacted the performance of tight ends. A critical threshold for significance was set at a p-value of 0.05. Furthermore, we utilized fantasy points as a metric to measure the increase in skill post-recovery. Fantasy points is a system that calculates a player's performance. Points are added and taken away based on how the player performs during the

game. By examining these data points, we aimed to quantify and establish how much the recovery process positively influences the skill and performance of tight ends in the NFL. Injury data was gathered from various news articles from Sports Illustrated, CBS Sports, ESPN, and the NFL. The data used included fantasy points, the existence of an injury, season, player name, and number of games played. This data was used to calculate player performance following the methodology of Fantasy Pros.

Season: Season played

ACL or MCL Tear: Binary variable to say if an injury occurred that season

Games Played: Games played that season

Player Name: Name of player

**Exploratory Data Analysis**

In the exploratory data analysis phase, we delved into the statistical findings generated from the t-tests and fantasy point calculations. This involved identifying patterns, trends, and correlations within the dataset. A Kruskal Wallis test was performed to verify that the average FP and Fantasy Points per game are consistent each season. A total of 568 TEs played in the NFL between 2010 and 2020. Of these TEs, 30 were identified to have suffered an MCL or ACL tear. Of these 30, 11 retired after their injury, for a post-injury retirement rate of 36.7%.

| N (with injury) | Return to Play | Retired |
|---|---|---|
| 30 | 19 | 11 |

Table 1. The number of Tight Ends that returned to play after injury and number of players that retired.

**Paired T-Test:**

To perform a paired t-test, we'll compare players' fantasy points per game (FPTS.G) before and after their injury. The paired t-test will help determine if there's a statistically significant difference in players' performance before and after they suffered an ACL/MCL tear.

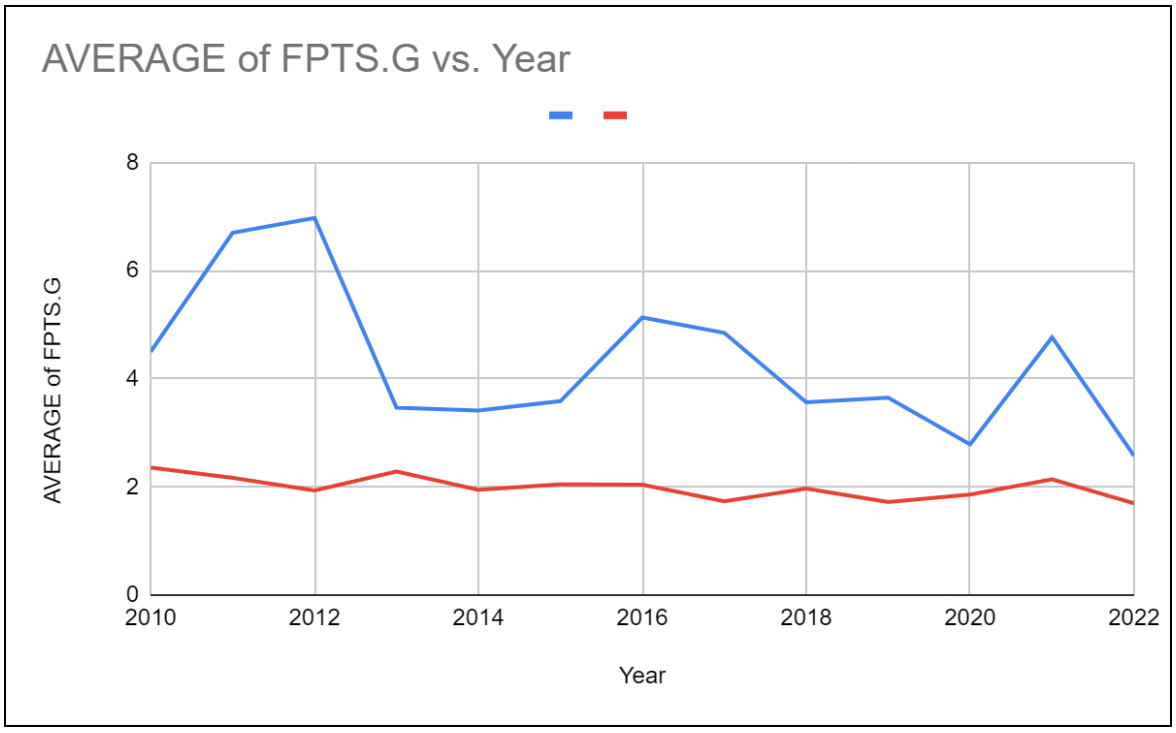
**Data Preparation**: Identify the players with ACL injuries. Collect the FPTS.G for each player before and after the injury. Ensure the data pairs (pre-injury and post-injury FPTS.G) are aligned correctly.

**Hypotheses**: **Null Hypothesis (H0)**: There is no significant difference in the FPTS.G of players before and after an ACL injury. **Alternative Hypothesis (H1)**: There is a substantial difference in the FPTS.G of players before and after an ACL injury.

**Assumptions**: The differences between paired observations are normally distributed.

**Perform the Test**: Calculate the differences between each pair of observations (pre-injury FPTS.G and post-injury FPTS.G). Compute the mean and standard deviation of these differences. Use the t-distribution to determine the test statistic and p-value.

**Interpret the Results**: Compare the p-value to the significance level (usually 0.05). If the p-value is less than 0.05, reject the null hypothesis. Based on our calculations, the paired t-test produced a value of 0.977, signifying the return to sport rate of 97%.




Graph 1. Average field goal points of the tight end before and after injury

## Results and Discussion

The results obtained from the statistical analyses and exploratory data analysis form the basis of our discussion. We present findings on the significance of ACL or MCL tear recovery interventions on tight ends' career lengths and performance improvements. Additionally, we discuss any observed patterns or correlations within the data that contribute to our understanding of the effectiveness of recovery processes. This section aims to provide a comprehensive overview of the impact of ACL or MCL tear recovery on tight ends in the NFL, concluding the statistical evidence and data trends. A paired and two-sample t-test was performed to calculate the recovery rate.

## Conclusion

This study contributes valuable insights into recovering tight ends following ACL or MCL tears in the NFL. In future research, we aim to employ statistical analyses and explore relevant data to determine whether advancements in surgical techniques and recovery protocols have positively improved elite athletes' career longevity and performance outcomes. While this paper establishes the foundation for such analyses, drawing definitive conclusions will require more extensive data collection and investigation in subsequent studies. The findings of this study hold implications for both sports medicine professionals and athletes, providing valuable information to enhance recovery strategies and optimize the post-injury trajectories of tight ends in the NFL. Further research and continued monitoring of athlete recovery will contribute to the ongoing efforts to mitigate the impact of ACL or MCL tears in professional football.

In the NFL, anterior cruciate ligament (ACL) and Medial Collateral Tears (MCL) tears are widespread injuries that present formidable challenges to athletes. Given the unique demands of their position, tight ends are particularly prone to these injuries, which can impact their longevity in the league and the overall quality of their careers. This research delves into the repercussions of tear recovery on the career length and performance of NFL tight ends, utilizing data from 2010 to 2022. T-test results reveal no statistically significant decline in performance observed among tight ends who experience an ACL tear and return to play. Moreover, the study indicates no substantial difference in the length of careers between players who have suffered an ACL tear and those who have not.

To enhance the survey on ACL tear recovery among NFL tight ends, it is essential to delve into the post-play performance of these athletes in a more comprehensive manner. While the current

analysis has considered the performance metrics of players who returned after an ACL tear, it may be beneficial to investigate why some players never returned to the field after such an injury. Examining factors such as the severity of the tear, the effectiveness of rehabilitation programs, and individual player characteristics could provide valuable insights into the challenges faced by those who did not make a successful comeback. Additionally, incorporating qualitative data, such as interviews with players, medical staff, and coaches, can offer a more holistic understanding of athletes' psychological and physical hurdles during recovery. Another aspect not inspected is the effect of these injuries on rookie players. Although their recovery is similar to those who have been in the NFL for a few years, their return rate has shown to be low. This could be because rookies have yet to impact the NFL and the NFL team they play for, causing their dismissal from the team.

Moreover, given the limitations of using Fantasy Points (FP) as a performance metric, exploring alternative metrics that may provide a more nuanced perspective on player effectiveness post-ACL tear is advisable. Metrics such as on-field impact, contribution to team success, and positional-specific statistics could offer a more targeted assessment of a tight end's performance, accounting for the unique demands of their position. By employing a multi-dimensional approach to evaluating player recovery, researchers can gain a more accurate and thorough understanding of the long-term implications of ACL tears on NFL tight ends over the past decade. This refined methodology may contribute to a more nuanced analysis that considers both quantitative and qualitative aspects of post-injury performance.

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