Hamstring Injuries in Major League Soccer: A 10-year Analysis of Injury Rate and Return to Play

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BACKGROUND

- Anterior cruciate ligament (ACL) injuries are significant in Major League Soccer (MLS) athletes, impacting player availability and performance.
- Understanding ACL injury patterns and recovery timelines can help optimize rehabilitation protocols and player management strategies in professional soccer.

PURPOSE

This study analyzes the incidence of ACL injuries and the timelines for return-to-play (RTP).

➔ Examine the incidence of ACL injuries in MLS athletes.

➔ Assess RTP timelines following ACL reconstruction.

➔ Identify factors associated with RTP duration.

➔ Evaluate post-injury performance.

METHODS

- MLS Injury Surveillance database was queried for ACL injuries from 2010-2021
- ACL injury definition: injury involving ACL, with or without co-ligament involvement, requiring medical attention
- Demographic and injury characteristics were collected for descriptive analysis.
- Matched-cohort design:

- Injured athletes were matched to uninjured controls (1:2 ratio).

- Matching based on position, age, injury season, baseline stats

- Performance analysis:

- First 4 full seasons post-injury compared to pre-injury baseline

- Statistical analysis:

- Univariate 2-group comp performed using independent t-tests.

RESULTS

Table A. Forward Metrics Compared with 1 Year Before Index Year

Player Metrics	Control	Achilles Injury	P-Value
Games Played per Season			
Index Year	-0.09 ± 8.68	0.05 ± 8.07	0.189
1 Y After Injury	-3.77 ± 10.13	-2.38 ± 10.78	0.466
2 Y After Injury	-3.58 ± 9.33	-2.14 ± 9.15	0.479
3 Y After Injury	-2.58 ± 9.69	-0.46 ± 7.90	0.595
Minutes Played per Season			
Index Year	-93.94 ± 831.3	-37.29 ± 799.46	0.397
1 Y After Injury	-429.16 ± 91.11	-390.72 ± 116.52	0.351
2 Y After Injury	-366.52 ± 912.91	-401.92 ± 757.28	0.257
3 Y After Injury	-342.61 ± 859.57	-351.07 ± 871.85	0.317
Goals per Season			
Index Year	-0.91 ± 5.78	-0.21 ± 5.85	0.889
1 Y After Injury	-2.91 ± 4.02	-2.05 ± 5.78	0.957
2 Y After Injury	-2.32 ± 4.49	-2.22 ± 5.64	0.740
3 Y After Injury	-2.30 ± 4.16	-2.05 ± 4.99	0.782
Assists per Season			
Index Year	0.62 ± 4.08	-0.48 ± 3.07	0.110
1 Y After Injury	-0.44 ± 3.51	-1.38 ± 2.25	0.112
2 Y After Injury	-0.33 ± 3.83	-1.50 ± 2.32	0.117
3 Y After Injury	-0.59 ± 3.79	-2.39 ± 1.84	**0.030**

Table B. Midfielder Metrics Compared with 1 Year Before Index Year

Player Metrics	Control	Achilles Injury	P-Value
Games Played per Season			
Index Year	0.38 ± 8.41	1.14 ± 200.93	0.925
1 Y After Injury	-0.70 ± 9.54	1.07 ± 202.16	0.932
2 Y After Injury	0.38 ± 9.34	-21.15 ± 9.88	0.137
3 Y After Injury	-0.58 ± 9.12	-20.91 ± 8.94	0.395
Minutes Played per Season			
Index Year	-7.50 ± 59.32	62.93 ± 78.03	0.596
1 Y After Injury	-119.01 ± 890.65	-29.87 ± 862.83	0.654
2 Y After Injury	1.97 ± 76.13	-101.73 ± 113.72	0.134
3 Y After Injury	-146.63 ± 800.80	-105.68 ± 894.80	0.487
Goals per Season			
Index Year	-0.01 ± 3.30	-1.27 ± 55.89	0.924
1 Y After Injury	-0.32 ± 3.24	12.53 ± 195.95	0.922
2 Y After Injury	0.30 ± 3.05	-7.67 ± 2.84	0.851
3 Y After Injury	-0.75 ± 2.64	-8.06 ± 2.13	0.231
Assists per Season			
Index Year	-0.14 ± 3.75	-0.01 ± 3.20	0.817
1 Y After Injury	-0.07 ± 3.74	-0.53 ± 3.28	0.336
2 Y After Injury	-0.36 ± 3.04	-0.67 ± 3.23	0.471
3 Y After Injury	-0.26 ± 2.87	-0.99 ± 2.76	0.195

Table C. Defender Metrics Compared with 1 Year Before Index Year

Player Metrics	Control	Achilles Injury	P-Value
Games Played per Season			
Index Year	0.87 ± 8.59	1.69 ± 8.48	0.458
1 Y After Injury	-0.22 ± 9.17	-0.28 ± 8.58	0.183
2 Y After Injury	0.43 ± 8.73	0.43 ± 9.43	**0.011**
3 Y After Injury	0.73 ± 8.62	0.73 ± 9.40	0.052
Minutes Played per Season			
Index Year	61.50 ± 808.45	101.43 ± 812.56	0.398
1 Y After Injury	-34.23 ± 855.82	-60.94 ± 779.35	0.183
2 Y After Injury	34.80 ± 792.11	-221.60 ± 833.66	**0.007**
3 Y After Injury	18.20 ± 824.46	-145.21 ± 862.75	0.079
Goals per Season			
Index Year	-0.10 ± 1.11	0.29 ± 1.36	0.944
1 Y After Injury	-0.11 ± 1.23	0.21 ± 1.18	0.862
2 Y After Injury	-0.14 ± 1.15	-0.04 ± 1.03	0.373
3 Y After Injury	-0.42 ± 0.72	0.12 ± 1.27	0.982
Assists per Season			
Index Year	0.24 ± 2.09	0.31 ± 2.32	0.893
1 Y After Injury	-0.01 ± 1.66	-0.05 ± 1.63	0.860
2 Y After Injury	0.21 ± 1.95	-0.22 ± 2.12	0.291
3 Y After Injury	-0.05 ± 1.42	-0.17 ± 2.02	0.671

Table D. Goalkeeper Metrics Compared with 1 Year Before Index Year

Player Metrics	Control	Achilles Injury	P-Value
Games Played per Season			
Index Year	-1.20 ± 11.36	1.30 ± 12.02	0.562
1 Y After Injury	-2.85 ± 11.85	0.40 ± 12.83	0.620
2 Y After Injury	-3.44 ± 14.27	2.43 ± 13.14	0.751
3 Y After Injury	-3.62 ± 9.98	-4.57 ± 10.32	0.268
Minutes Played per Season			
Index Year	-110.45 ± 1021.26	105.80 ± 1084.95	0.571
1 Y After Injury	-243.20 ± 1075.46	27.70 ± 1160.61	0.616
2 Y After Injury	-289.10 ± 1284.06	200.63 ± 1190.25	0.739
3 Y After Injury	-322.22 ± 904.19	-421.25 ± 922.76	0.273
Clean Sheets per Season			
Index Year	-0.30 ± 3.59	1.50 ±4.65	0.932
1 Y After Injury	-0.30 ± 5.03	-1.20 ± 4.18	0.426
2 Y After Injury	0.11 ± 5.02	-1.00 ± 4.11	0.393
3 Y After Injury	-1.01 ± 3.44	-2.50 ± 3.07	0.261
Conceded Goals per Season			
Index Year	-1.90 ± 17.19	-0.80 ± 12.88	0.234
1 Y After Injury	-3.90 ± 15.83	4.10 ± 14.79	0.651
2 Y After Injury	-4.36 ± 20.18	9.65 ± 19.07	0.834
3 Y After Injury	-6.19 ± 12.43	-1.22 ± 16.07	0.454

Key findings:

- Total of 1,255 players with hamstring injuries were analyzed
- Forwards had sig drop in assists 3 years post-injury (p=0.03)
- Defenders showed a significant reduction in minutes played 2 years post-injury (p=0.007)
- Midfielders showed no sig. diff. in performance metrics, with a non-significant decrease in goals (p=0.231)
- Goalkeepers showed a non-significant trend toward fewer clean sheets (p=0.273)

DISCUSSION

Hamstring injuries have differential long-term effects on MLS players depending on position

Forwards are notably impacted in assists, possibly due to lingering deficits in speed or explosive movements

Defenders experience the most significant drop in playing time, suggesting long-term limitations in fitness, sprinting or recurrence concerns

Midfielders and goalkeepers exhibit more stable post-injury performance

These results highlight the potential for position-tailored rehabilitation programs and RTP protocols to better restore pre-injury performance levels