



Частичные повреждения внутренней боковой связки коленного сустава среди профессиональных футболистов: спортспецифическая реабилитация как залог успешности лечения

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Распространенность

- Составляют 3-4% от всех травм
- Травматизм - 0.33/1000 часов
- В два раза чаще у спортсменов-мужчин
- Чаще в конце тайма



Lundblad M, Hägglund M, Thomeé C, et al. Medial collateral ligament injuries of the knee in male professional football players: a prospective three-season study of 130 cases from the UEFA Elite Club Injury Study. *Knee Surg Sports Traumatol Arthrosc.* 2019;27(11):3692-3698. doi:10.1007/s00167-019-05491-6

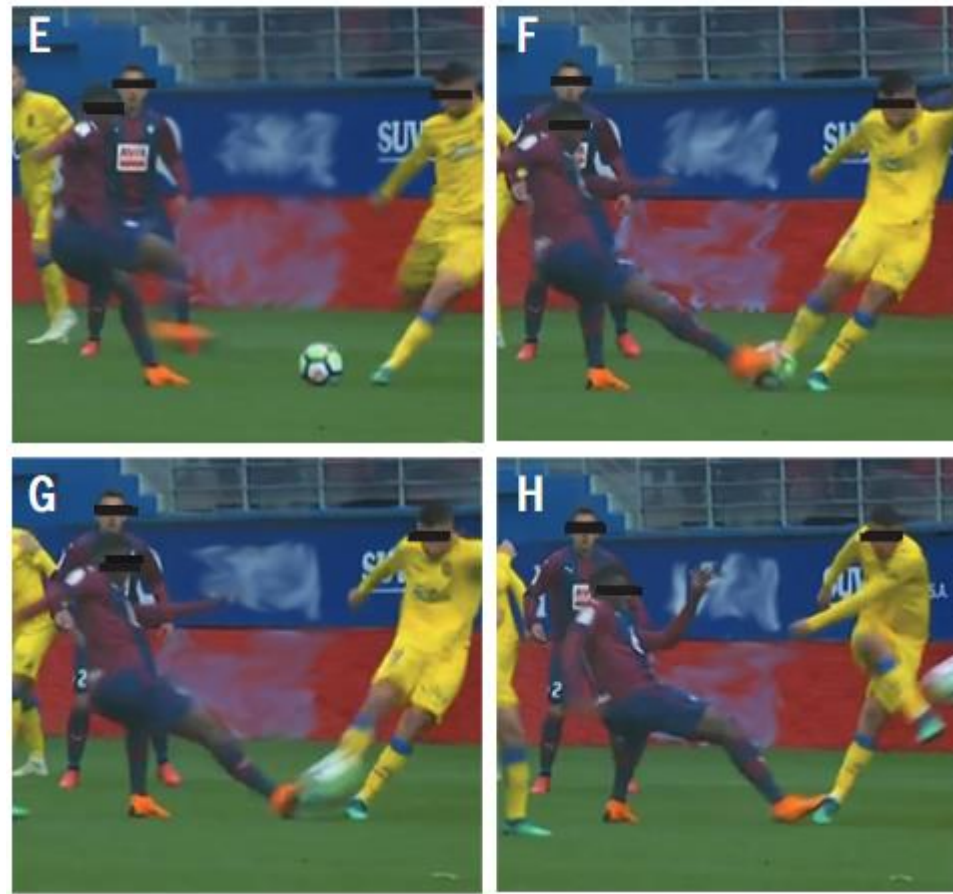
Lundblad M, Waldén M, Magnusson H, Karlsson J, Ekstrand J. The UEFA injury study: 11-year data concerning 346 MCL injuries and time to return to play. *Br J Sports Med.* 2013;47(12):759-762. doi:10.1136/bjsports-2013-092305

Механизм травмы

- Три основных механизма
- 62% контактный, 24% неконтактный, 14% не прямой контакт
- Вальгус (100%), наружная ротация стопы (92%), приведение бедра (73%)



Механизм травмы



Buckthorpe M, Pisoni D, Tosarelli F, Danelon F, Grassi A, Della Villa F. Three Main Mechanisms Characterize Medial Collateral Ligament Injuries in Professional Male Soccer-Blow to the Knee, Contact to the Leg or Foot, and Sliding: Video Analysis of 37 Consecutive Injuries. J Orthop Sports Phys Ther. 2021;51(12):611-618. doi:10.2519/jospt.2021.10529

МАТЧ!

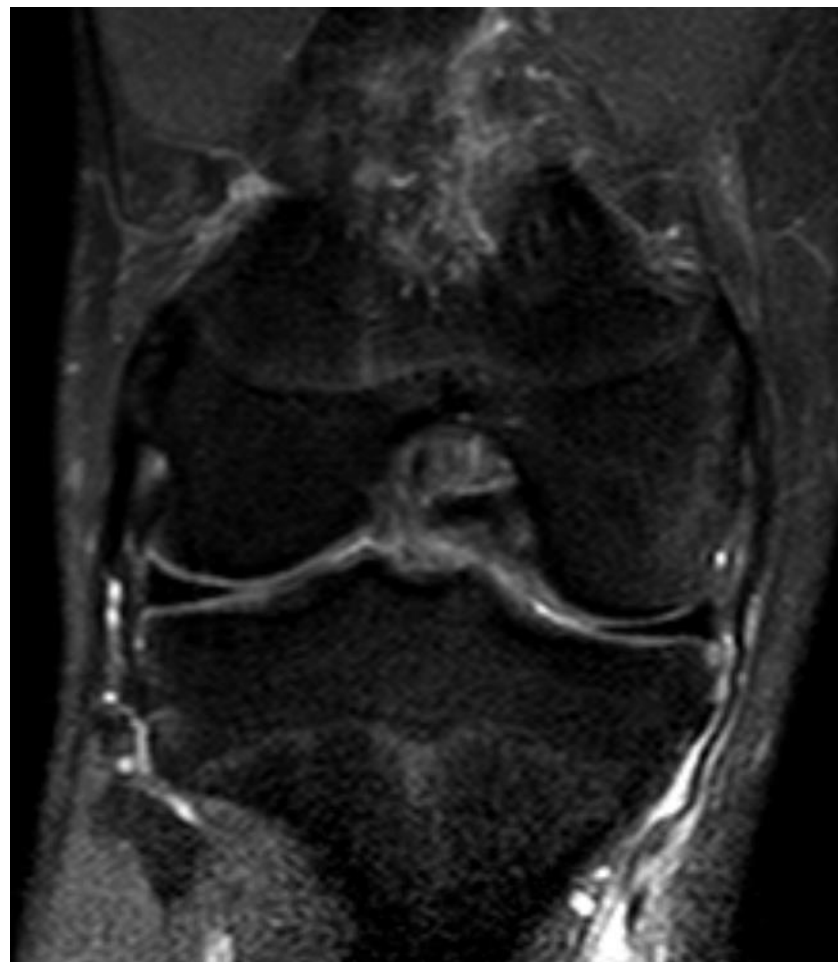
ПРЯМОЙ ЭФИР



МР-Классификация



Grade I



Grade II



Grade III

Сроки лечения

- 24.6 ± 16 дней (минимум 3, максимум 56)
- Не выявлена разница в сроках RTP между контактными и неконтактными травмами (медиана = 16 vs 16, Q1 = 8 vs 7, Q3 = 29 vs 30)
- Не влияли на перформанс и доступность игрока после RTP
- Вероятность рецидива: 10.3%
- Сроки лечения рецидива: 27 ± 13 дней

Ekstrand J, Krusch W, Spreco A, et al. Time before return to play for the most common injuries in professional football: a 16-year follow-up of the UEFA Elite Club Injury Study. *British Journal of Sports Medicine* 2020;54:421-426.

Lundblad M, Hägglund M, Thomeé C, et al. Medial collateral ligament injuries of the knee in male professional football players: a prospective three-season study of 130 cases from the UEFA Elite Club Injury Study. *Knee Surg Sports Traumatol Arthrosc.* 2019;27(11):3692-3698. doi:10.1007/s00167-019-05491-6

Принципы лечения

- Реабилитация – основа лечения!
- **Брейс:** 32±20 без против 42±13 ($p = 0.010$) дней с ним при Grade II
- **Инъекции:** PRP или ГКС только при персистирующей боли
- **Физиотерапия** – дополнительно для снижения боли

Svantesson J, Piuksi R, Weissglas E, et al. Shedding light on the non-operative treatment of the forgotten side of the knee: rehabilitation of medial collateral ligament injuries-a systematic review. BMJ Open Sport Exerc Med. 2024;10(2):e001750. Published 2024 Jun 25. doi:10.1136/bmjsem-2023-001750

Zou G, Zheng M, Chen W, He X, Cang D. Autologous platelet-rich plasma therapy for refractory pain after low-grade medial collateral ligament injury. J Int Med Res. 2020;48(2):300060520903636. doi:10.1177/0300060520903636

Jones L, Bismil Q, Alyas F, Connell D, Bell J. Persistent symptoms following non operative management in low grade MCL injury of the knee - The role of the deep MCL. Knee. 2009;16(1):64-68. doi:10.1016/j.knee.2008.09.002

Control Chaos Continuum

HIGH CONTROL			MODERATE CONTROL			CONTROL>CHAOS				MODERATE CHAOS				HIGH CHAOS			
SESSIONS	<0.35 GAME LOAD**		SESSIONS	<0.35-0.45 GAME LOAD**		SESSIONS	<0.40-0.60 GAME LOAD**			SESSIONS	~0.55-0.70 GAME LOAD**			SESSIONS	>0.70 GAME LOAD**		
TYPE	RETURN TO RUNNING PHASE 1 (RTR1)		TYPE	RETURN TO RUNNING: CONTROLLED CHANGE OF DIRECTION PHASE 2 (RTR2)		TYPE	INTENSIVE		EXTENSIVE	TYPE	INTENSIVE		EXTENSIVE	TYPE	INTENSIVE		EXTENSIVE
CONDITIONING EMPHASIS	THRESHOLD ENDURANCE (80-85% MAX ^(m)) INTENSIVE ENDURANCE (70-80% MAX ^(m))		CONDITIONING EMPHASIS	THRESHOLD ENDURANCE (80-85% MAX ^(m)) INTENSIVE ENDURANCE (70-80% MAX ^(m))		CONDITIONING EMPHASIS	EXTENSIVE TEMPO LEVEL 1 (~55-70% MS) VO ² MAX DEVELOPMENT (>85% MAX ^(m)) THRESHOLD ENDURANCE (80-85% MAX ^(m)) INTENSIVE ENDURANCE (70-80% MAX ^(m))			CONDITIONING EMPHASIS	EXTENSIVE TEMPO LEVEL 2 (~65-85% MS) EXTENSIVE TEMPO LEVEL 1 (~55-65% MS) VO ² MAX DEVELOPMENT (>85% MAX ^(m)) THRESHOLD ENDURANCE (80-85% MAX ^(m)) INTENSIVE ENDURANCE (70-80% MAX ^(m))			CONDITIONING EMPHASIS	SPEED (>85% MS) EXTENSIVE TEMPO LEVEL 2 (~65-75% MS) VO ² MAX DEVELOPMENT (>85% MAX ^(m)) THRESHOLD ENDURANCE (80-85% MAX ^(m)) INTENSIVE ENDURANCE (70-80% MAX ^(m))		
DESCRIPTION	LINEAR RUNNING (> FROM ALTER-G - 90% BW) LOW MAGNITUDE ACC/DEC LOW VOLUME EXPLOSIVE DISTANCE LOW MUSCULOSKETEAL IMPACT FORCES END OF STAGE INTRODUCTION TO HSR (INJURY SPECIFIC) EXAMPLES: 3X6, 4X6 (3- 4X3MINS) 3X8, 4X8 (3-4X4MINS) (1-2MINS PR)		DESCRIPTION	INTRODUCE COD WITH/WITHOUT BALL (45-180° TURNING) >LINEAR RUNNING SPEEDS (FARTLEK) >MUSCULOSKELETAL IMPACT FORCES/JOINT DEMANDS INTRO SHORT-RANGE TECHNICAL E.G. PASSING EXAMPLE: 3-5X3-4MINS (1-2MINS PR)		DESCRIPTION	COD WITH*/WITHOUT BALL (ALL TURNS) RUNNING SPEEDS (~60-70% MS - HSR) (FARTLEK) LOW VOLUME/INTENSITY P+M/POP >MUSCULOSKELETAL IMPACT FORCES/JOINT DEMANDS >ACC/DEC PREPARATION PROGRESSION OF TECHNICAL SKILLS INTENSIVE: 4-6X1-2MINS (1-2MINS PR) EXTENSIVE: 4-6X4-5MINS (2-3MINS PR) TEMPO/AEROBIC POWER INTERVAL RUNNING [17-13/15-15S] *WITH BALL WILL INCREASE HEART-RATE RESPONSE, AND PLAYER MOTIVATION TO PERFORM DRILLS*			DESCRIPTION	>RUNNING SPEEDS ~(>75% MS) >HSR ACCUMULATED >SPRINT EXPOSURE POSITIONAL P+M/POP (INCLUDING TECHNICAL SKILLS) >ACC/DEC DEMANDS (POSITIONAL) >MUSCULOSKELETAL IMPACT/JOINT DEMANDS >VOLUME/INTENSITY SPEED: 5-10S (1:5-1:10) SPEED ENDURANCE: PRODUCTION/MAINTENANCE INTENSIVE: 20-45S/1-3MIN (1-2MINS PR) EXTENSIVE: 4-8MINS (2-3MINS PR)			DESCRIPTION	>RUNNING SPEEDS (>90% MS) >HSR/SPR ACCUMULATED RTT POSITIONAL SPECIFIC DEMANDS ACC/DEC DEMANDS (POSITIONAL) >MUSCULOSKELETAL IMPACT/JOINT DEMANDS >MATCH-DAY TYPE PREPARATION SPECIFIC P+M/POP (POSITIONAL – TECHNICAL SKILLS) SPEED: 5-10S (1:5-1:10) SPEED ENDURANCE: PRODUCTION/MAINTENANCE INTENSIVE: 20-45S/1-3MIN (1-2MINS PR) EXTENSIVE: 4-8MINS (2-3MINS PR)		
LOAD EMPHASIS (INJURY SPECIFIC)	TD	<EXPD/ <HSR	TD	>EXPD/ <HSR		TD	>EXPD / <HSR	TD	>EXPD / >HSR (SPR)	TD	>EXPD/ <HSR	TD	<EXPD/ >HSR (SPR)	TD	>EXPD/ <HSR	TD	<EXPD/ >HSR (SPR)
	<ACC	<DEC	>ACC	>DEC		>ACC	>DEC	>ACC	>DEC	>ACC	>DEC	<ACC	<DEC	>ACC	>DEC	<ACC	<DEC
NO. OF SESSIONS	2-4		NO. OF SESSIONS	3-4		NO. OF SESSIONS	3-4			NO. OF SESSIONS	3-5 (DEPENDANT UPON TRAINING METHOD)			NO. OF SESSIONS	3-5 (DEPENDANT UPON TRAINING METHOD)		

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
DATE	21.07.2025	22.07.2025	23.07.2025	24.07.2025	25.07.2025	26.07.2025	27.07.2025
DATE	+ Rehab Day 16	+ Rehab Day 17	+ Rehab Day 18	+ Rehab Day 19	+ Rehab Day 20	+ Rehab Day 21	+ Rehab Day 22
PHASE	RECOVERY ↓	RETURN TO RUN 1 ↑		RECOVERY ↓	RETURN TO RUN 1 ↑		RECOVERY ↓
STRUCTURE	DAY OFF	PRE-ACTIVATION REHAB 1' – 45' Wobble board FP foot mobility BW x 3 sets x 8+8 reps FP Spine mobility BW x 3 sets x 8+8 reps Front leg -> Back leg FP BW x 3 sets x 6+6 reps Kicking action knee joint 4 stacks x 3 sets x 6 reps (right) Wobble board SP foot mobility BW x 3 sets x 8+8 reps SP Spine mobility BW x 3 sets x 8+8 reps Front leg -> Back leg SP BW x 3 sets x 6+6 reps Kicking action knee joint 4 stacks x 3 sets x 6 reps (right) Wobble board TP foot mobility BW x 3 sets x 8+8 reps TP Spine mobility BW x 3 sets x 8+8 reps Front leg -> Back leg TP BW x 3 sets x 6+6 reps Kicking action knee joint 4 stacks x 3 sets x 6 reps (right) PHASE 1 RETURN TO RUN 1 46' – 65' TD: 2 500 m 2 557 m EXPD: <100 m 98 m PS: 14 km/h 15,1 km/h Warm Up 1 lap + 5x3 m channel Straight line runs 70 m 14 km/h x 10 reps Straight line runs 70 m 14 km/h x 10 reps AEROBIC AERO-BIKE 66' – 105' 5':2' x 6 reps 30" ↑ to 15" ↓ UPPER BODY MAX STRENGTH 106' – 146' Weighted pull ups 12,5 kg ↑ x 3 sets x 4 reps Weighted dips 12,5 kg ↑ x 3 sets x 4 reps Barbell seal row 65 kg ↑ x 3 sets x 4 reps Barbell bench press 70 kg ↑ x 3 sets x 4 reps Barbell bent-over row 70 kg ↑ x 3 sets x 4 reps Barbell push press 45 kg ↑ x 3 sets x 4 reps	PRE-ACTIVATION REHAB 1' – 45' Wobble board FP foot mobility BW x 3 sets x 8+8 reps FP Spine mobility BW x 3 sets x 8+8 reps SLS resist knee load straight RB x 3 sets x 6+6 reps Kicking action knee joint 5 stacks x 3 sets x 6 reps (right) Wobble board SP foot mobility BW x 3 sets x 8+8 reps SP Spine mobility BW x 3 sets x 8+8 reps SLS resist knee load foot in RB x 3 sets x 6+6 reps Kicking action knee joint 5 stacks x 3 sets x 6 reps (right) Wobble board TP foot mobility BW x 3 sets x 8+8 reps TP Spine mobility BW x 3 sets x 8+8 reps SLS resist knee load foot out RB x 3 sets x 6+6 reps Kicking action knee joint 5 stacks x 3 sets x 6 reps (right) PHASE 1 RETURN TO RUN 1 46' – 65' TD: 3 500 m 3 495 m EXPD: <150 m 104 m PS: 16 km/h 17,7 km/h Warm Up 1 lap + 5x3 m channel Straight line runs 70 m 16 km/h x 10 reps Straight line runs 70 m 16 km/h x 10 reps Straight line runs 70 m 16 km/h x 10 reps AEROBIC AERO-BIKE 66' – 105' 5':2' x 6 reps 20" ↑ to 10" ↓ LOWER BODY MAX STRENGTH 106' – 146' Trap bar dead lift 50 kg x 3 sets x 4 reps Barbell forward lunge 10 kg x 3 sets x 4+4 reps Barbell lateral lunge 10 kg x 3 sets x 4+4 reps Barbell crossover lunge 10 kg x 3 sets x 4+4 reps Barbell backward lunge 10 kg x 3 sets x 4+4 reps	CORE STRENGTH 1' – 20' SL Dynamic plank BW x 4 sets x 4+4 reps Resisted rotation 6 stacks x 4 sets x 4+4 reps Resisted lateral flexion 6 stacks x 4 sets x 4+4 reps	PRE-ACTIVATION REHAB 1' – 45' Wobble board FP foot mobility BW x 3 sets x 8+8 reps FP Spine mobility BW x 3 sets x 8+8 reps Front leg -> Back leg FP BW x 3 sets x 6+6 reps Kicking action knee joint 5 stacks x 3 sets x 6 reps (right) Wobble board SP foot mobility BW x 3 sets x 8+8 reps SP Spine mobility BW x 3 sets x 8+8 reps Front leg -> Back leg SP BW x 3 sets x 6+6 reps Kicking action knee joint 5 stacks x 3 sets x 6 reps (right) Wobble board TP foot mobility BW x 3 sets x 8+8 reps TP Spine mobility BW x 3 sets x 8+8 reps Front leg -> Back leg TP BW x 3 sets x 6+6 reps Kicking action knee joint 5 stacks x 3 sets x 6 reps (right) PHASE 1 RETURN TO RUN 1 46' – 65' TD: 3 500 m 3 565 m EXPD: <150 m 71 m PS: 16 km/h 18,2 km/h Warm Up 1 lap + 5x3 m channel Straight line runs 70 m 16 km/h x 10 reps Straight line runs 70 m 16 km/h x 10 reps Straight line runs 70 m 16 km/h x 10 reps AEROBIC AERO-BIKE 66' – 105' 5':2' x 6 reps 30" ↑ to 15" ↓ UPPER BODY MAX STRENGTH 106' – 146' Weighted pull ups 15 kg ↑ x 3 sets x 4 reps Weighted dips 15 kg ↑ x 3 sets x 4 reps Barbell seal row 70 kg ↑ x 3 sets x 4 reps Barbell bench press 75 kg ↑ x 3 sets x 4 reps Barbell bent-over row 75 kg ↑ x 3 sets x 4 reps Barbell push press 47,5 kg ↑ x 3 sets x 4 reps	PRE-ACTIVATION REHAB 1' – 45' Wobble board FP foot mobility BW x 3 sets x 8+8 reps FP Spine mobility BW x 3 sets x 8+8 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kg ↑ x 3 sets x 4+4 reps Barbell crossover lunge 20 kg ↑ x 3 sets x 4+4 reps Barbell backward lunge 20 kg ↑ x 3 sets x 4+4 reps	DAY OFF

MR-Контроль





БЛАГОДАРЮ ЗА ВНИМАНИЕ!

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