

Clinical outcome of Knee Medial Collateral Ligament reconstruction with Allograft or Autograft – A systematic Review

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Introduction

- Incidence of injury 0.24/1000 people (1)
- Acute isolated MCL injuries are often managed conservatively (2,3)
- However acute high grade MCL injuries may require surgery especially when associated with other ligamentous injury (multi ligamentous knee injury)(4)
- Chronic MCL injury with ACL tear requires ACLR along with MCLR to prevent ACLR failure.



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Introduction – Surgical management

- Graft options for reconstruction:
 - Autograft
 - Allograft
 - Synthetic
- No existing clear evidence for graft superiority
- Aim: Compare functional outcomes and complication rate of autograft Vs allograft in MCL reconstruction



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Methodology

- Systematic review
- Search of Key terms through PUBMED and SCOPUS
- Inclusion criteria: All study designs reporting PROMS of MCL reconstruction
- Publications screened and data extracted

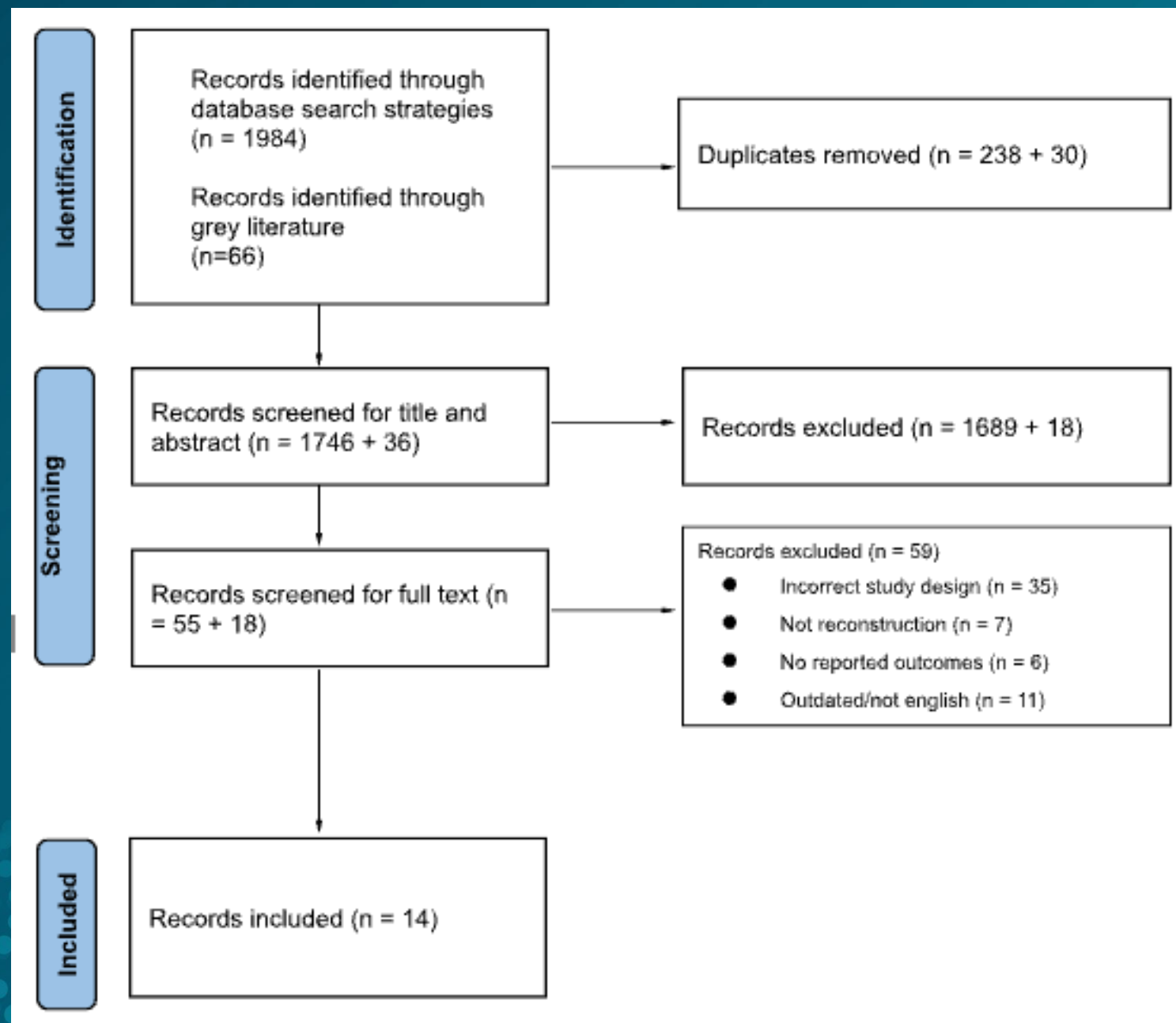


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Results



Results

- 11 Studies identified
 - 4 Achilles (TA) allograft
 - 7 Hamstring autograft (4 ST, 2 Gracilis, 1 ST + Gracilis)
- Mean age: 32.7 (18-61)
- Mean follow up: 30 Months (12-49.7)
- 274 patients
 - Allograft: 77
 - Autograft: 197 (ST – 88, Gracilis – 75, ST + Gracilis – 34)
- ▶ **IKDC Score improvement**
 - ▶ TA Allograft: Preop 45.3-63 -> Postop 67.9-93
 - ▶ Autograft: Preop 46.8-58 -> Postop 71.7 – 85



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Results

Allograft Papers	Graft	Pre-Op IKDC	Post-Op IKDC	Pre-Op Lysholm	Post-Op Lysholm
Xu et al.	Not specified	47.85	87.88	49.42	90.35
Zhang et al.	Achilles	45.3	87.7	N/A	N/A
Yazdi et al.	Achilles	63	93	67	92
Bonadio et al.	Achilles	N/A	71.63	N/A	80.08
Barrett et al.	Achilles	N/A	67.9	N/A	N/A
Hanley et al.	Semitendinosus	N/A	54.3	N/A	59.4
Dong et al.	Tibialis anterior	N/A	N/A	N/A	N/A

Autograft Papers	Graft	Pre-Op IKDC	Post-Op IKDC	Pre-Op Lysholm	Post-Op Lysholm
La Prade et al.	Semitendinosus	53	85	67	90
Haroun	Semitendinosus	46.8	71.7	27	87.6
Sim et al.	Semitendinosus	N/A	N/A	N/A	70.1
Abulsoud et al.	Semitendinosus	N/A	N/A	55.39	89.4
Tapasvi et al.	Semitendinosus and gracilis	58	78.2	61.9	88.1
Fernando et al.	Gracilis	N/A	N/A	58.43	89.67
Alm et al.	Gracilis	73.6	80.3	75.1	82.9



Results – Achilles allograft

Paper	Graft	Pre-Op IKDC	Post-Op IKDC	Statistically significance	Pre-Op Lysholm	Post-Op Lysholm	Statistically significance
Zhang et al.	Achilles	45.3	87.7	Y p<0.01	N/A	N/A	
Yazdi et al.	Achilles	63	93	Y p<0.05	67	92	Y p<0.05
Bonadio et al.	Achilles	N/A	71.63		N/A	80.08	
Barrett et al.	Achilles	N/A	67.9		N/A	N/A	

Graft	Pre-Op IKDC	Post-Op IKDC	Pre-Op Lysholm	Post-Op Lysholm
Achilles	45.3 to 63	67.9 to 93	67	80.08 to 92

Paper	Graft	Sample Size	Type of injury
Zhang et al.	Achilles	21	ACL + MCL
Yazdi et al.	Achilles	11	6 ACL+MCL, 2 PCL+MCL, 3 MCL+ACL+PCL
Bonadio et al.	Achilles	13	MCL+PCL only
Barrett et al.	Achilles	32	1 revision MCL, 11 MCL+ACL, 3 MCL+PCL, 12 MCL+ACL+PCL, 1 MCL+ACL+LCL, 1 MCL+PCL+LCL, 3 MCL+ACL+PCL+LCL



Results – Autograft

Paper	Graft	Pre-Op IKDC	Post-Op IKDC	Statistical significance	Pre-Op Lysholm	Post-Op Lysholm	Statistical significance
La Prade et al.	Semitendinosus	53	85	Y p<0.05	67	90	Y p<0.05
Haroun	Semitendinosus	46.8	71.7	Y p<0.05	27	87.6	Y p<0.05
Sim et al.	Semitendinosus	N/A	N/A		N/A	70.1	
Abulsoud et al.	Semitendinosus	N/A	N/A		55.39	89.4	Y p<0.01
Tapasvi et al.	Semitendinosus and gracilis	58	78.2	Y p<0.01	61.9	88.1	Y p<0.01
Fernando et al.	Gracilis	N/A	N/A		58.43	89.67	unclear
Alm et al.	Gracilis	N/A	80.3		N/A	82.9	unclear

Graft	Pre-Op IKDC	Post-Op IKDC	Pre-Op Lysholm	Post-Op Lysholm
Semitendinosus	46.8 to 53	71.7 to 85	27 to 67	70.1 to 90
Gracilis	N/A	80.3	58.43 to 61.9	82.9 to 89.67
Semitendinosus and gracilis	58	78.2	61.9	88.1

Paper	Graft	Sample Size	Type of Injury
La Prade et al.	Semitendinosus	29	24 ACL+MCL, 5 isolated MCL
Haroun	Semitendinosus	14	2 isolated MCL, 6 MCL+ACL, 6 patient MCL+PCL+/-ACL
Sim et al.	Semitendinosus	26	ACL+MCL only
Abulsoud et al.	Semitendinosus	19	10 MCL+ACL, 4MCL+PCL, 5 MCL isolated
Tapasvi et al.	Semitendinosus and gracilis	34	2 MCL only, 25 MCL+ACL, 6 ACL+PCL+MCL, 1 PCL+MCL
Fernando et al.	Gracilis	58	ACL+MCL only
Alm et al.	Gracilis	17	ACL+MCL



Results – Complications

- Allograft overall – 13%
 - Laxity: 3.9%, Infection 3.9%
- Autograft overall – 19%
 - Laxity/Instability: 16.8%

Graft	Population	Overall complication rate	Graft failure	Laxity/Instability	Infection	Haematoma	Painful hardware
Achilles	77	13%	2 (2.6%)	3 (3.9%)	3 (3.9%)	1 (1.3%)	1 (1.3%)

Graft	Population	Overall complication rate	Graft failure	Laxity/Instability	Stiffness requiring EUA	Infection
Semitendinosus	88	37.5%	n/a	33 (37.5%)	n/a	n/a
Gracilis	75	1.3%	1 (1.3%)	n/a	n/a	n/a
Semitendinosus and gracilis	34	11.8%	n/a	n/a	3 (8.8%)	1 (2.9%)



Discussion

- Significant improvement in PROMS in both autograft and allograft group
- Higher rate of laxity and instability in the SemiT autograft group
- Medial hamstrings act as dynamic stabilisers to valgus stress, which may add to laxity when it is harvested for MCL recon
- Statistical analysis was not possible due to the heterogeneity of the data
- MCL reconstruction techniques not compared which may also affect overall outcome

Conclusion

- Further research is required to determine the optimal graft used for MCL reconstruction
- MCL injuries remain a difficult injury to treat surgically and should be referred to high volume specialists



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