

Implant-Free Reconstruction Techniques for ligaments of the knee

**“Innovative & Cost-
Effective Alternatives”**

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Boston
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IMPLANT FREE RECONSTRUCTION TECHNIQUES

Confluent tunnel technique

Bone tunnel technique

Suture bridge technique

Cinch knot technique



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Confluent tunnel technique

ACL + LCL



PCL + MCL



ACL + ALL



Bone tunnel technique

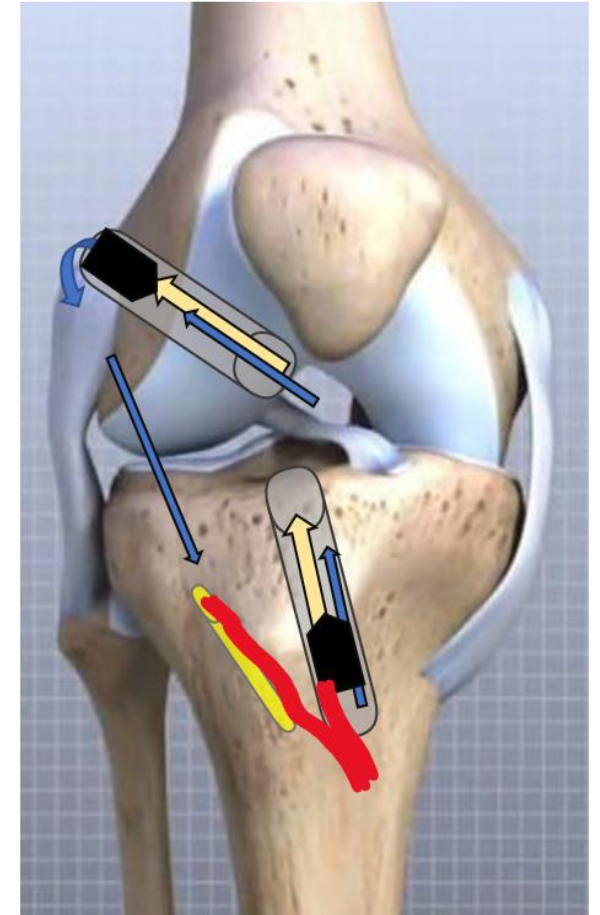
ACLR+ MM ROOT



MCL Repair



ACL + ALL



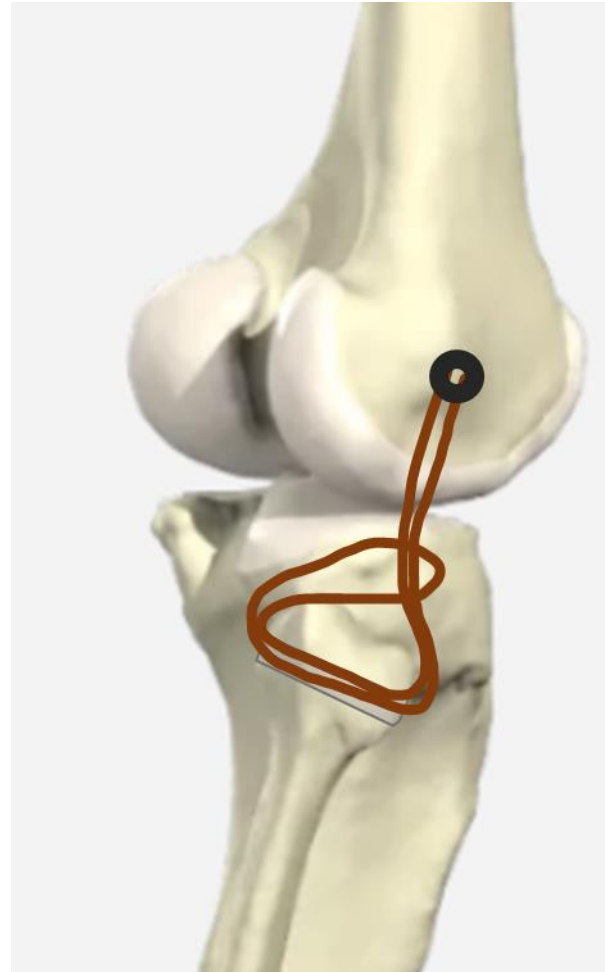
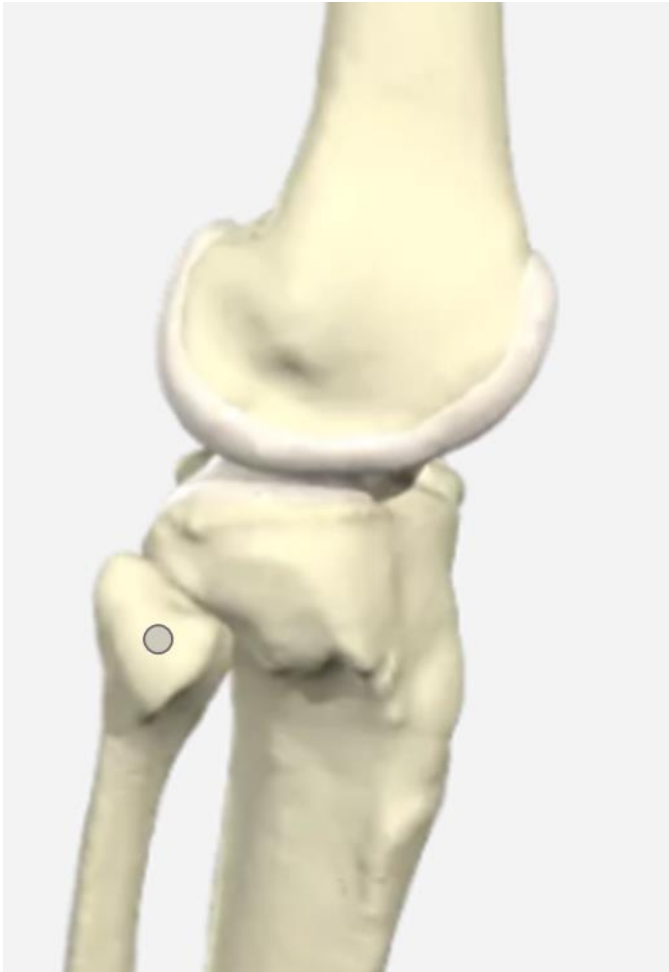
Suture Bridge technique

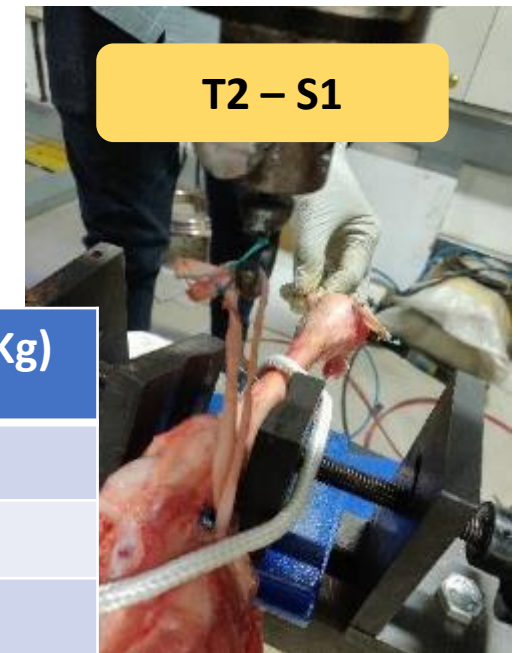
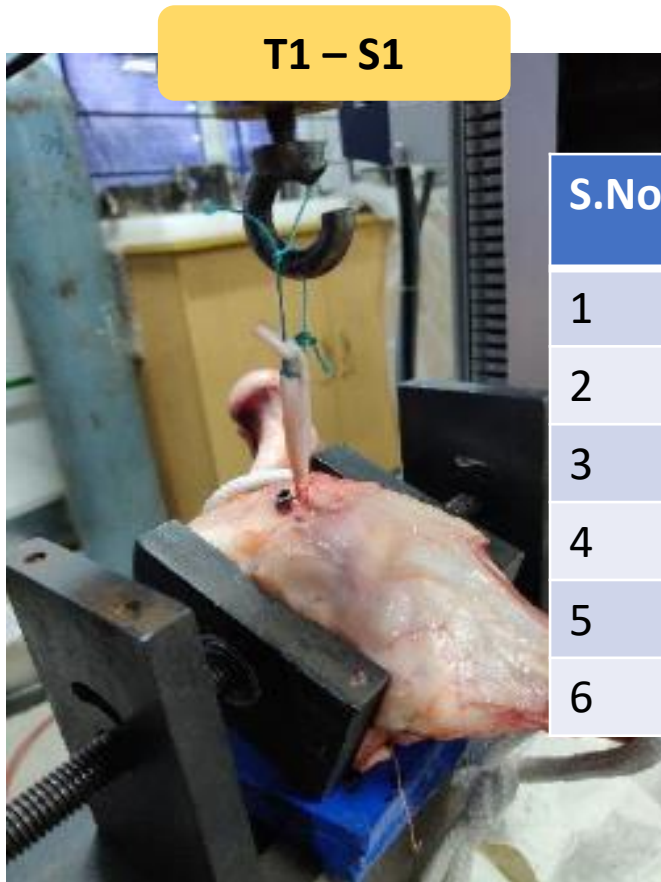
MPFL R.



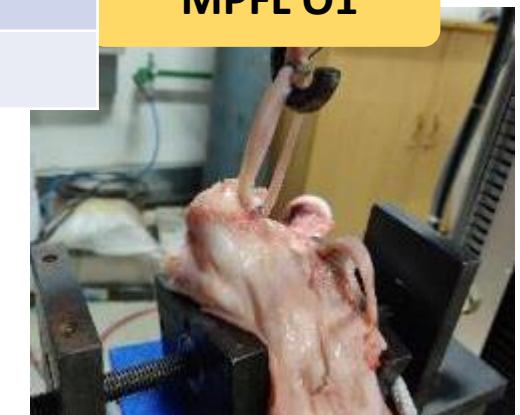
Cinch knot technique

LCL





S.No	SPECIMEN	AVERAGE LOAD TO FAILURE (Kg)
1	BONE TUNNEL	20.11737
2	SUTURE BRIDGE	42.19748
3	CINCH KNOT	19.7025
4	MPFL O1	21.40646
5	2 Tendon 1 Screw	14.906699
6	1 Tendon 1 screw	15.17434



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COMBINED ACL + ALL

PATIENTS	PRE-OP			2 years follow-up	
31	TLS (Mean,SD)	IKDC (Mean,SD)	ROM (Mean,SD)	TLS (Mean,SD)	IKDC (Mean,SD)
	49.20,9.07	47.87,12.01	102.71,19.46	91.86,6.78	89.58,10.62
				P <0.01	P<0.01

MPFL RECONSTRUCTION

PATIENTS	Mean PRE-OP KUJALA score	5 years follow-up
52	67+/-5	93+/-7

COMPARISON WITH OTHER TECHNIQUES

Study	Year	Technique	Post-op Kujala score	Follow up	Implants	
Becher et al	2013	Schottle et al	84+/-12	26 months	2 peek anchors, 1 IF screw	
Sandigursky et al	2016	Schottle at al	94.3+/-1.2	1 yr	2 metal anchors, 1 IF screw	
Astur et al	2015	Astur et al	82+/-14	5 years	1 Endobutton,	

COMBINED MCL + PCL

PATIENTS	PRE-OP			2 year follow-up		
11	TLS (Mean,SD)	IKDC (Mean,SD)	ROM (Mean,SD)	TLS (Mean,SD)	IKDC (Mean,SD)	ROM (Mean,SD)
	51.9,10.07	42.7,14.00	110,17.2	82.86,8.78	81.58,10.62	120.00,5.00
				P <0.01	P<0.01	

COMBINED ACL + LCL

PATIENTS	PRE-OP			2 year follow-up		
10	TLS (Mean,SD)	IKDC (Mean,SD)	ROM (Mean,SD)	TLS (Mean,SD)	IKDC (Mean,SD)	ROM (Mean)
	39, 11.70	45.27,12.00	100.61,18.16	84.8,9.34	87.42,9.6	122.50
				P <0.01	P<0.01	

COMBINED ACL + LM/MM ROOT REPAIR

PATIENTS	PRE-OP			2 year follow-up		
6	TLS (Mean,SD)	IKDC (Mean,SD)	ROM (Mean,SD)	TLS (Mean,SD)	IKDC (Mean,SD)	ROM (Mean,SD)
	40.21, 12.10	44.27,12.00	80.61,19.23	93.1,6.4	91.42,6.6	
				P <0.01	P<0.01	



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$$\text{Cost/QALY} = \frac{[\text{TOTAL cost}]}{[(\text{Postoperative QWB} - \text{Preoperative QWB}) \times \text{Life expectancy}]}.$$

Procedure	QWB Diff	LE	Diff x LE	Total cost	Cost/QALY
Trad ACL + ALL	.032	34	1.088	45036	41,393
IFRT	.030	36	1.116	23812	21,366
T. ACL + ROOT	.024	28	0.672	31812	47339
IFRT	.025	26	0.650	23812	36633
Trad MPFL	.038	40	1.52	35812	23560
IFRT	.040	39	1.56	10612	6802

> [Arthroscopy](#). 2011 Oct;27(10):1317-22. doi: 10.1016/j.arthro.2011.06.001. Epub 2011 Aug 19.

Cost-effectiveness analysis of the most common orthopaedic surgery procedures: knee arthroscopy and knee anterior cruciate ligament reconstruction

James H Lubowitz ¹, David Appleby

DEMERITS OF STUDY:

Steeper Learning Curve – Sx Time

Killer Turns?

Graft Length – Limiting

Non-Athletic

Sample size

Long term follow up



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CONCLUSION:

BIOMECHANICAL ANALYSIS, OUTCOME STUDY,
COST EFFECTIVENESS STUDY

COST

SMALLER INDIAN KNEES

ALLOGRAFT

TUNNEL MANAGEMENT



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