



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11

Impact of Graft Type on Failure Rates in Bicruciate Ligament Reconstruction

Ya-Wen Tsai, Kun-Han Lee, Hsuan-Hsiao Ma, Kun-Hui
Chen, En-Rung Chiang*

Taipei Veterans General Hospital, Taipei, Taiwan



Faculty Disclosure Information

- Nothing to disclosure

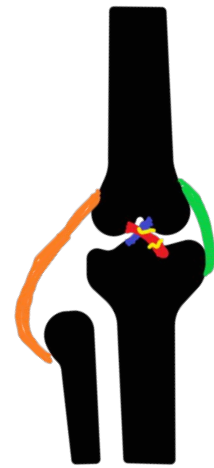


ISAKOS
CONGRESS
2025

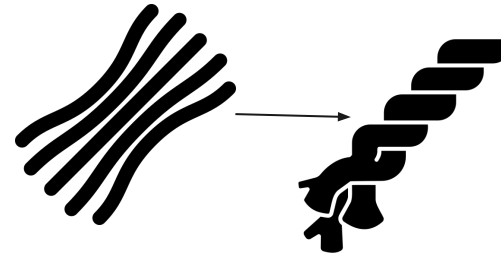


MUNICH
GERMANY
June 8-11

❖ Background



- ✓ Multiligament injury
- ✓ Knee dislocation, unstable



- ✓ Early bicruciate reconstruction



- ✓ Graft failure
- ✓ Revision



ISAKOS
CONGRESS
2025

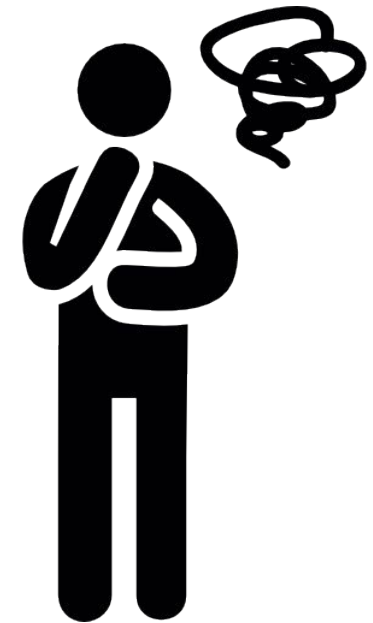


MUNICH
GERMANY
June 8-11



❖ Aims & Goals

- Evaluation of grafts failure
- Patient demography and possible risk factor
- Correlation of graft types with graft failure



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11

❖ Patient selection

Inclusion

- ACL combined PCL reconstruction
- Allograft or Autograft (hamstring)
- Dr. E-R Chiang and Dr. H-L Ma



- ✓ Retrospective study
- ✓ Between 2002/02 and 2022/07

(PLC not exclusive, n=5, 8.8%)

Exclusion

- Open reconstruction
- Combined fracture around the knee
- Previous knee surgery
- Loss follow-up or lack image evidence

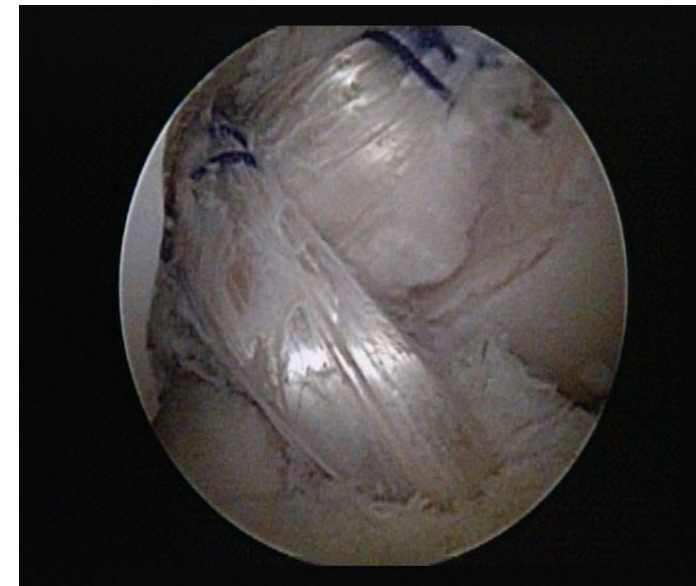
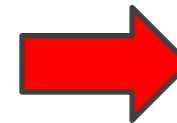
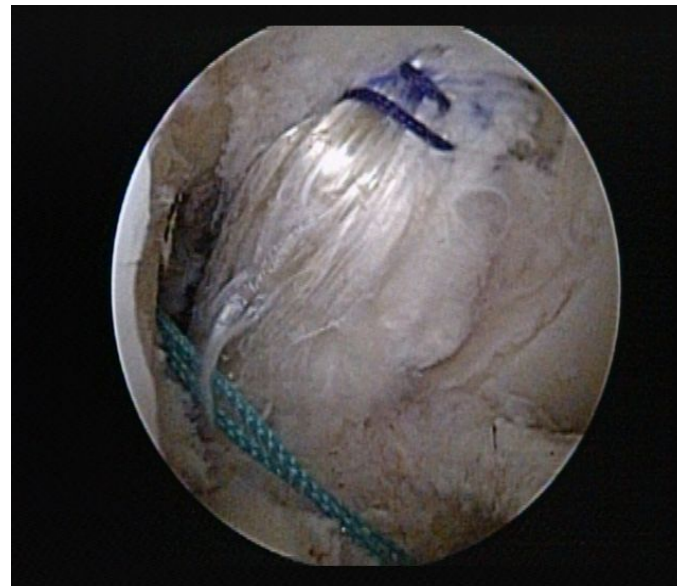
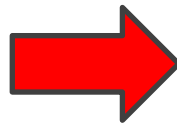


ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11

❖ Arthroscopic bicruciate reconstruction



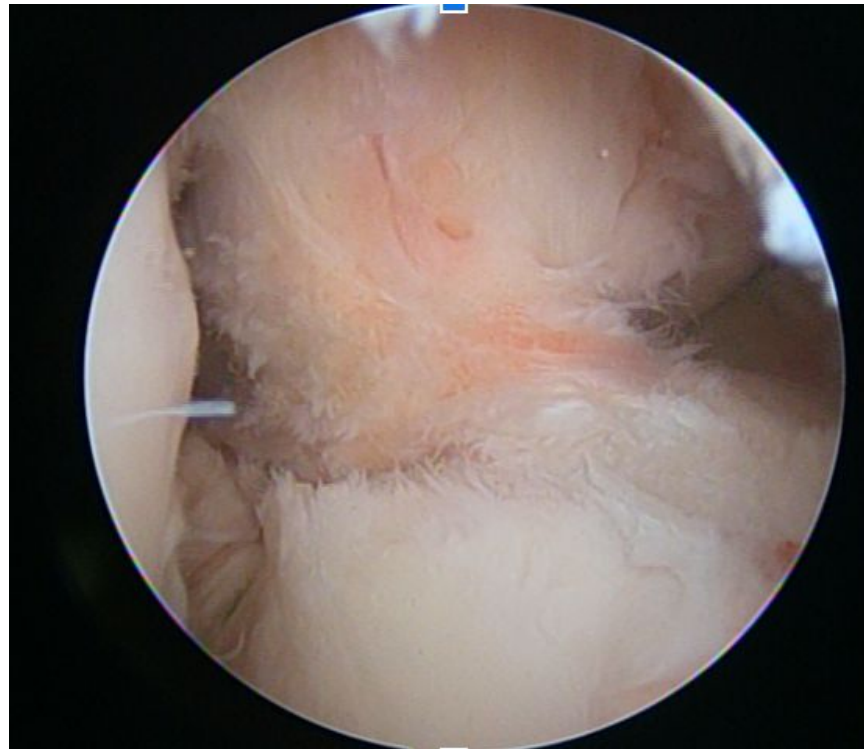
ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11

❖ Graft failure identification

- Arthroscopic revision or MRI evidence



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11

❖ Graft failure analyze

- 57 patients
- 9 with graft failure
- Failure rate: 15.8%

9 patient with 11 failure graft		Auto	Allo	Total
ACL	(8/57=14.0%)	3	5	8
PCL	(3/57=5.3%)	0	3	3
Total		3	8	11



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11

❖ Results

- ✓ ACLR using allograft reveals significant high graft failure

Table2. Patients with and without graft failure

	Failure (n = 9)	Nonfailure (n = 48)	<i>P</i> Value
Age, yr	33.6 ± 12.1	36.2 ± 12.2	0.563
Sex (%)			0.704
Female	2 (22.2 %)	16 (33.3%)	
Male	7 (77.8 %)	32 (66.7%)	
Body mass index (kg/m ²)	27.1 ± 6.5	25.0 ± 4.9	0.265
Injury mechanism			0.921
Sports-related, n (%)	2(22.2%)	12(25.0%)	1.000
Traffic-related, n (%)	5(55.6%)	23(47.9%)	0.730
Traumatic impact to anterior tibia, n (%)	2(22.2%)	11(22.9%)	1.000
Other, n (%)	0(0.0%)	2(4.2%)	1.000
Concomitant meniscus injury	3 (33.3%)	14 (29.2%)	1.000
Concomitant MCL injury	1(11.1%)	6(12.5%)	1.000
Concomitant PLC injury	0(0.0%)	5(10.4%)	0.582
Medial meniscus meniscectomy	0(0.0%)	4(8.3%)	1.000
Lateral meniscus meniscectomy	0(0.0%)	5(10.4%)	0.582
Graft type			
ACL, allo:auto	6:3	8:40	0.004
PCL, allo:auto	5:4	30:18	0.722

NOTE. Data are expressed as mean ± standard deviation unless otherwise stated.



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8–11

❖ Results

- ✓ ACLR using allograft reveals significant high ACL graft failure

Table. Graft types under patients with and without ACL-graft failure

	A failure (n=8)	A non-failure(n=49)	P value
ACL, auto: allo	3:5	40:9	0.017
PCL, auto: allo	3:5	19:30	1.000

NOTE. Data are expressed via Fisher exact test

- ✓ Graft type reveals no significant with PCL graft failure

Table. Graft types under patients with and without PCL-graft failure

	P-failure (n=3)	P-non-failure (n=54)	P value
ACL, auto: allo	1:2	42:12	0.146
PCL, auto: allo	1:2	21:33	1.000

NOTE. Data are expressed via Fisher exact test



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11



❖ Results

- ✓ **Graft type** reveals **no** significant with patient reported outcomes

Table. PROs under patients with ACL autograft and ACL allograft

	Total	autograft	allograft	p-value
IKDC	80.5±14.4	80.8±15.9	79.3±8.6	0.741
Lysholm	84±13.4	84.1±14.7	83.9±9.0	0.946
Tegner	4.6±1.8	4.7±1.9	4.3±1.6	0.430
VAS	1.7±1.9	1.6±2.0	2.1±1.6	0.368

NOTE. Data are expressed as mean ± standard deviation unless otherwise stated.

PROs, patient reported outcomes

IKDC, International Knee Documentation Committee



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11



❖ Conclusions & Limitation

- ✓ High graft failure rate (15.8%) was found in bicruciate reconstruction (ACL>PCL)
- ✓ Use of allograft for ACLR in bicruciate reconstruction is significant associated with higher graft failure
- ✓ Autografts for ACL reconstruction was recommended in bicruciate ligament combined surgeries
- ✓ Limitation: retrospective nature, small sample size, less prior research studies (on bicruciate reconstruction graft failure)



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11



◆ References

- Panigrahi et al. *Asian Journal of Sports Medicine*. 2016 Mar; 7(1): 29287
- Costa GG et al. *J Exp Orthop*. 2022 Mar 15;9(1):26
- Cruz et al. *JB JS Open Access*. 2020 Dec 30;5(4):20.00106.
- Martin et al. *Arthroscopy*, 2019 Jun, Volume 35, Issue 1, 275 - 276
- Conyer RT et al. *Orthop J Sports Med*. 2024 May 15;12(5):23259671241249473



ISAKOS
CONGRESS
2025



MUNICH
GERMANY
June 8-11