

**DOES THE ANATOMICAL
ANTEROLATERAL LIGAMENT
RECONSTRUCTION
CHANGE THE ROTATIONAL STABILITY IN
ACL RECONSTRUCTION ?
(THE CADAVERIC STUDY)**

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DECLARATION OF INTEREST

No held shares

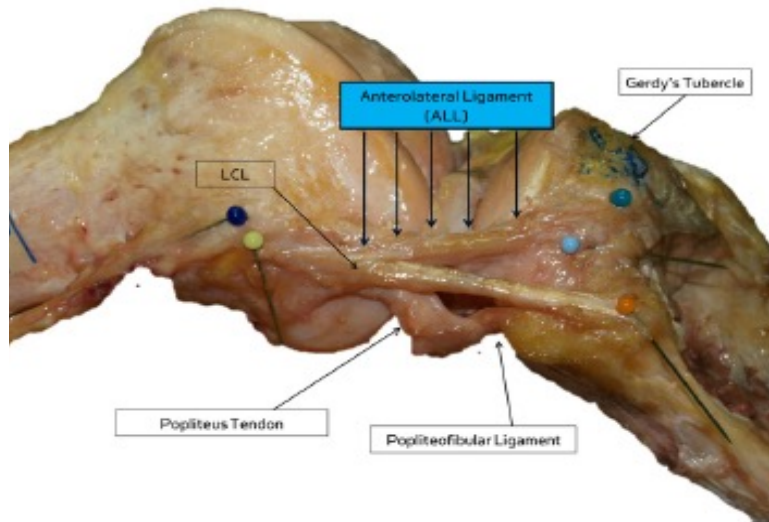
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Received institutional support from : Faculty of
Medicine Ramathibodi Hospital, Mahidol university

INTRODUCTION



Steven Claes et al. J. Anat. (2013)

Anatomic anterior cruciate ligament (ACL) reconstruction is favorable for long-term clinical outcomes, but the normal anterolateral rotational stability of the knee is not fully restored.

According to an in vitro study, isolated ACL transection could only produce a pivot shift not higher than grade I whereas the additional ALL transection resulted in a high-grade pivot shift in all specimens.

These findings suggested a high correlation between ALL lesion and high-grade pivot shift. Thus, the rotational stability might be controlled by additional ALL reconstruction

PURPOSE OF STUDY



Campbell's operative orthopaedics 13th ed

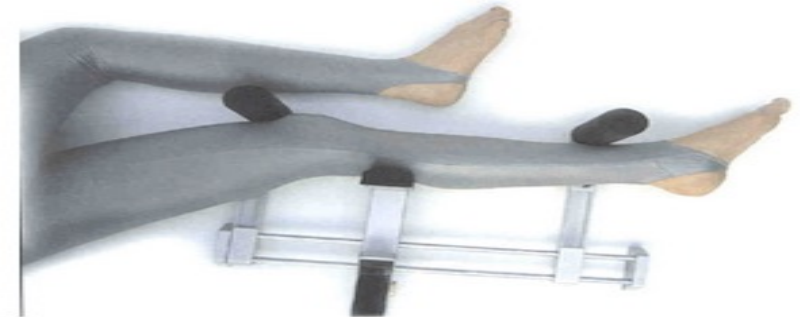
To compare rotational stability between anatomic single bundle ACL reconstruction and anatomic single bundle ACL reconstruction plus anterolateral ligament (ALL) reconstruction.

Primary outcome of this study is anterior tibial translation measured by Slocum test to represent rotational stability.

MATERIAL AND METHOD

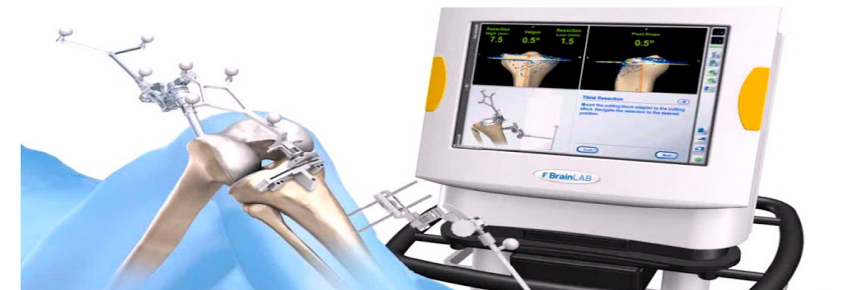
5 fresh frozen human cadaveric knees
(Randomized side with sealed envelope)

Telos stress device create anterior tibial translation



Telos stress device GA-III/E

BrainLab measure amount of anterior tibial translation



BrainLab : Kolibri , software ACL

Intact knee

Record T1

Cut ACL

Record T2

Cut ALL

Record T3

ACL reconstruction

Record T4

ALL reconstruction

Record T5

PROTOCOL

All translations (T) were recorded in 4 positions

30° flexion Neutral rotation	30° flexion Internal rotation
90° flexion Neutral rotation	90° flexion Internal rotation

T1 = Intact ACL & ALL
T2 = ACL deficiency & intact ALL
T3 = ACL & ALL deficiency
T4 = ACL Reconstruction
T5 = ACL + ALL Reconstruction



Create tunnels at femoral and tibial insertion



Pass semitendinosus graft through tunnels

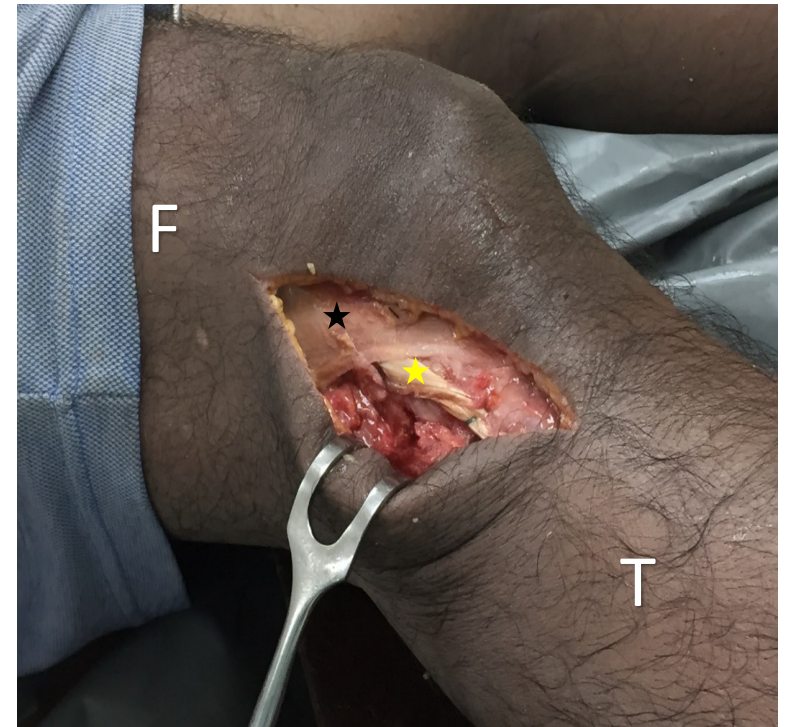


Fix semitendinosus graft at femoral insertion



Fix semitendinosus graft at tibial insertion

ALL RECONSTRUCTION



★ ALL graft

F Femur

★ Iliotibial band

T Tibia

Result

Anterior translation in each procedure (mm)

	Normal	Cut ACL	p-value compared to normal	Cut ALL	p-value compared to normal	ACLR	p-value compared to normal	ACLR + ALLR	p-value compared to normal
Neutral 30°	4.8 ± 2.1	8.0 ± 3.4	<0.01	11.0 ± 1.0	<0.01	5.2 ± 4.8	0.87	7.0 ± 4.4	0.36
Neutral 90°	3.8 ± 1.1	5.8 ± 1.9	0.01	7.6 ± 3.1	0.02	6.4 ± 2.6	0.03	6.2 ± 2.2	0.06
Internal rotation 30°	6.0 ± 3.1	6.6 ± 4.2	0.43	11.0 ± 4.2	<0.01	3.8 ± 4.4	0.14	6.0 ± 4.7	1.00
Internal rotate 90°	4.0 ± 2.7	5.0 ± 2.0	0.33	7.8 ± 3.0	0.03	5.0 ± 3.5	0.62	4.0 ± 2.7	1.00

Significant p-value < 0.05

Anterior translation in comparison between isolated ACLR and ACLR+ALLR

	ACLR	ACLR + ALLR	P-Value
Neutral 30°	5.2 ± 4.8	7.0 ± 4.4	0.02
Internal rotate 30°	3.8 ± 4.4	6.0 ± 4.6	0.03
Neutral 90°	6.4 ± 2.6	6.2 ± 2.2	0.84
Internal rotate 90°	5.0 ± 3.5	4.0 ± 2.7	0.23

Decrease anterior translation in flexion angle 90°

DISCUSSION

Anterior tibial translation was significantly increase when cut ACL and neutral rotation position of the knee (both 30° and 90° flexion).

It was not significantly increase when cut ACL and internal rotation position of the knee (both 30° and 90° flexion).

Anterior tibial translation was significantly increase (compare with normal knee) when cut ALL in all position.

This study showed that ALL was a secondary stabilizer which controlled both neutral and internal rotation position especially in internal rotation.

CONCLUSION

ALL has a role in restraint of anterior translation in **internal rotation** position

Anatomical ALL reconstruction might have a role in controlling rotational stability in **90° flexion** but had little effect in 30° flexion

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