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Radiographic Investigation of Differences in Static Anterior Tibial Translation With Axial Load Between Isolated ACL Injury and Controls

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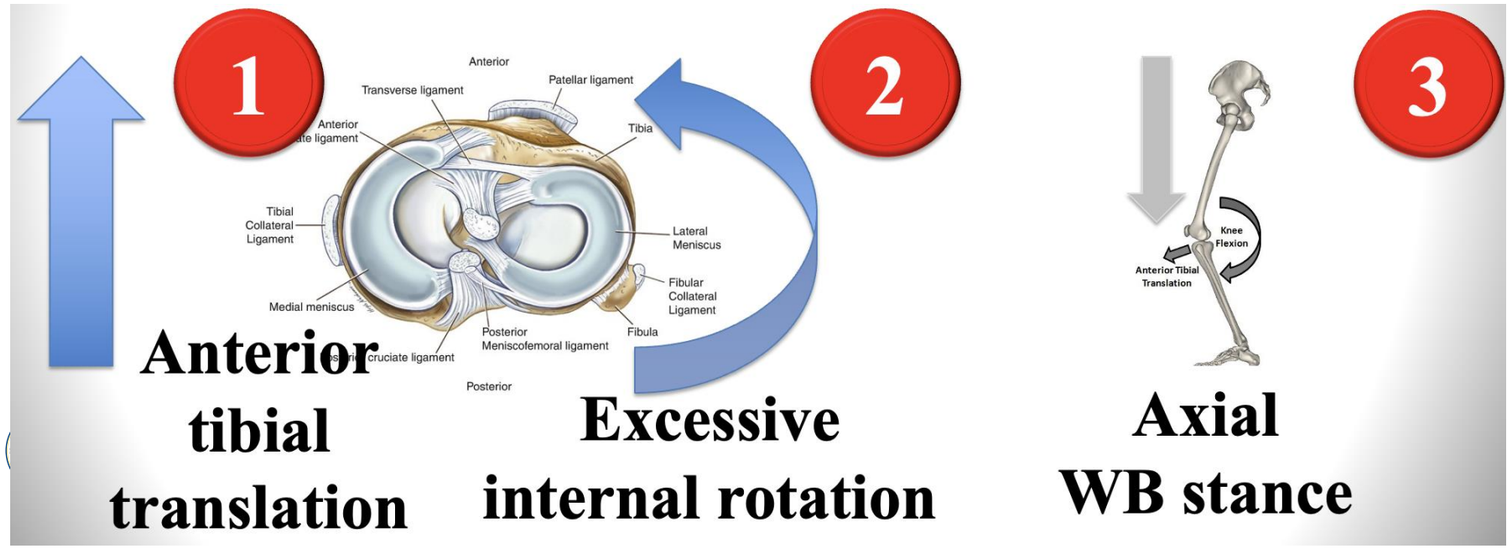
Faculty Disclosure Information

- Nothing to disclosure

Introduction

Laxity in ACL surgery can be assessed by the response to:

1) Translational force – Lachman test/ KT-1000
2) Excessive internal rotation- Pivot shift
3) Axial load= ‘Static anterior tibial translation’



Introduction- Axial load measurement

Static anterior tibial translation(SATT)
= In vivo measure of ACLR graft stress.

= radiographic measure of the amount of tibial translation
in response to the physiological **axial load** during a single-leg stance

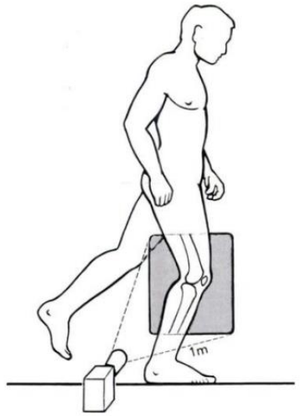


Fig. 1

The technique of the lateral monopodal stance test.

Fig. 2

The radiological measurement of medial anterior tibial translation (MATT-MS) in a monopodal stance test on a patient with chronic anterior laxity of one knee. On the right knee which had ACL rupture and a damaged medial meniscus, the MATT-MS was 10 mm, on the left (normal) knee it was 2 mm, giving a difference of 8 mm.

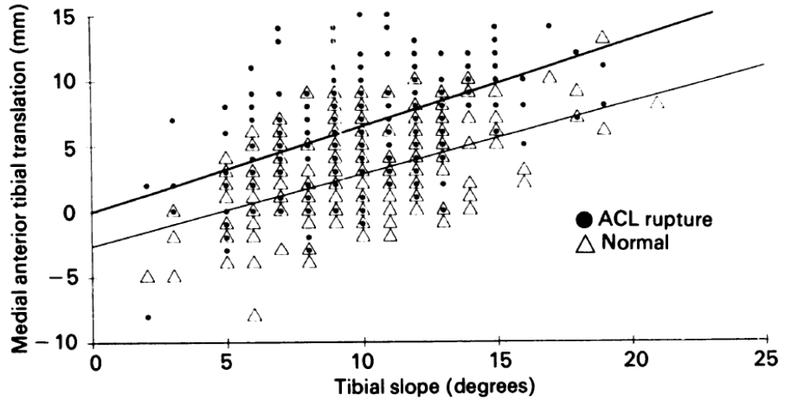


Fig. 6

Correlation between the slope of the tibial plateau and medial anterior tibial translation in monopodal stance (see text).

Slope and translation correlated,
even if ACL intact

Introduction

H Dejour et al first described SATT but only in ACL injured limb + contralateral limb, no true ‘normal’ cohort

AIM= establish normal values for SATT compared to ACL injured patients

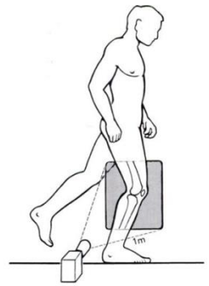


Fig. 1
The technique of the lateral monopodal stance test.

Methods

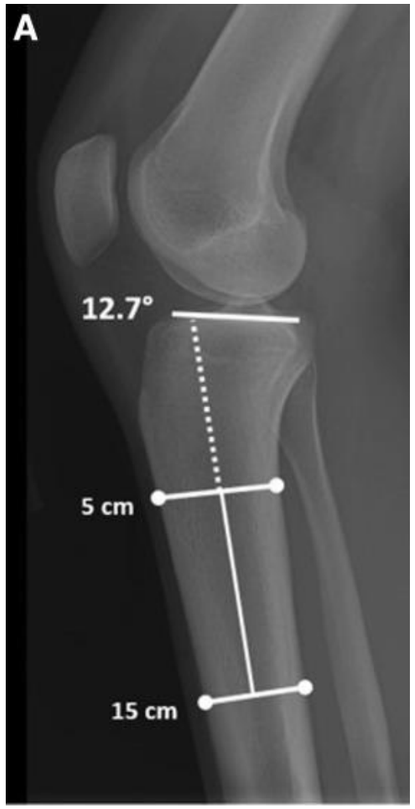
Consecutive series of patients without ligamentous or meniscal injuries between 2019 and 2022 was reviewed.

A matched consecutive cohort nonacute ACL injuries (surgery between 6 and 12 weeks after injury) without concomitant pathology was reviewed.

Methods

Measured;

SATT + Slope → Regression analysis



Results

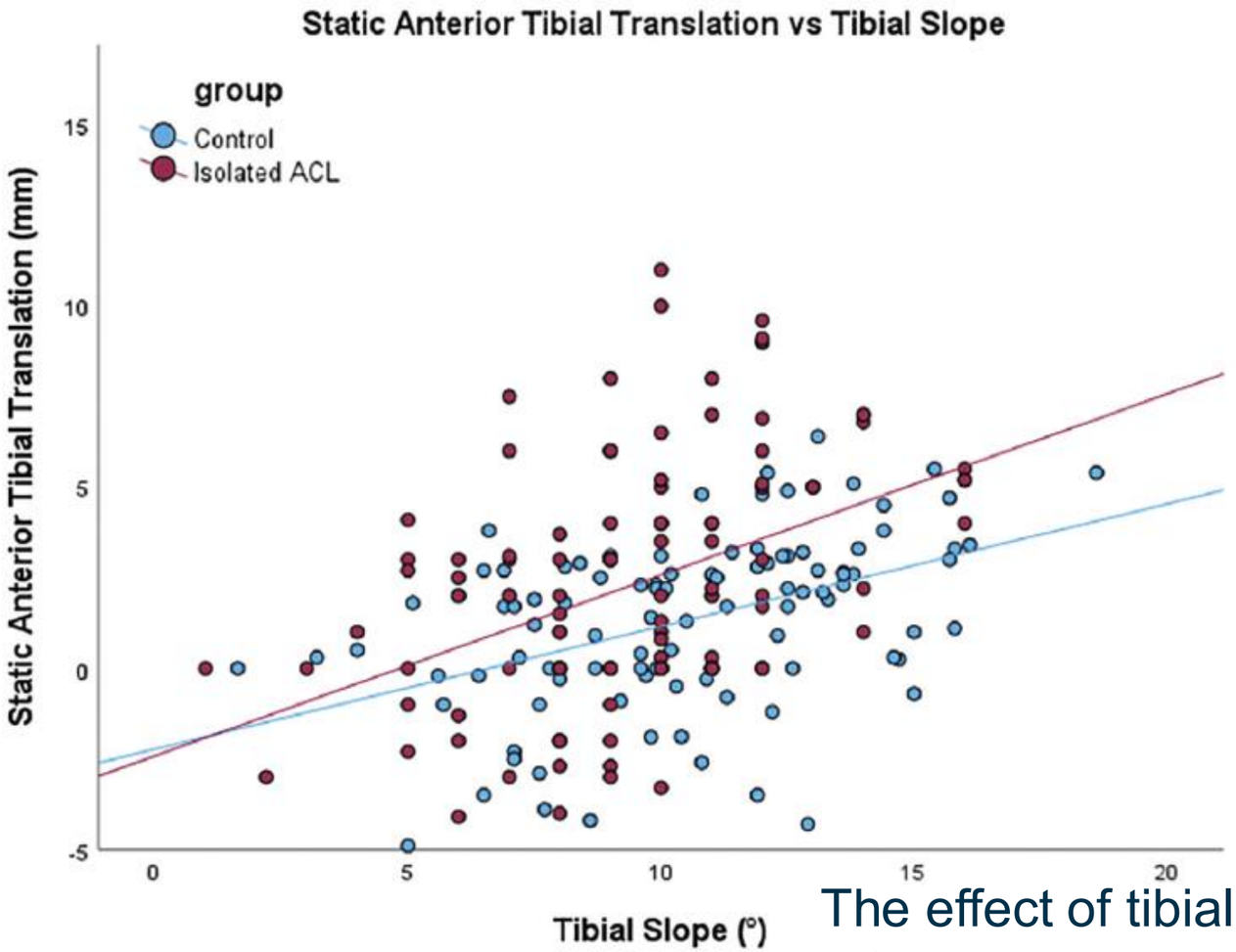
Patient Characteristics[a]

	Control Cohort	ACL-Injured Cohort	*P* Value
Number	101	115	—
Male sex	37/36.6%	56/48.7%	.074
Right side	52/51.5%	60/52.2%	.98
Age, y	22.91 (8.02)	32.81 (10.74)	**<.001**
SATT, mm	1.31 (2.44)	2.27 (3.36)	**.018**
PTS, deg	10.61 (3.28)	9.46 (2.85)	**.016**

ACL patients had greater SATT despite lower mean slope

Mean SATT normal cohort 1.31mm vs 2.27mm in ACL injured patient

Results



Line of best fit plotted for:

ACL (y = 2.42 + 0.5x)

control cohort (y = 2.33 + 0.34x)

The effect of tibial slope on SATT was greater in the ACL-injured cohort than in the control cohort

For every 1° increase in slope→0.5mm increase SATT

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Discussion

Most important finding= reference values for SATT

Control cohort mean SATT 1.31 mm (SD 2.44 mm)

vs.

ACL injury = mean SATT 2.27 mm (SD 3.36 mm)

Discussion

SATT correlated with tibial slope

0.34-0.6mm increase in SATT per 1° of PTS

SATT **not improved** with ACL reconstruction alone

KSSTA Knee Surgery Sports Traumatology Arthroscopy

Tibial slope and medial meniscectomy significantly influence short-term knee laxity following ACL reconstruction

David Dejour, Marco Pungitore, Jeremy Valluy, Luca Nover, Mo Saffarini & Guillaume Demey

Deflexion slope reducing osteotomy decreases SATT

Reduction in SATT from 11.7 mm to 4.3 mm by reducing the PTS from 13.2° to 4.4°

KNEE

Check for updates

First revision ACL reconstruction combined with tibial deflexion osteotomy improves clinical scores at 2 to 7 years follow-up

David Dejour[1] · Anouk Rozinthe[1] · Guillaume Demey[1] · ReSurg[2]

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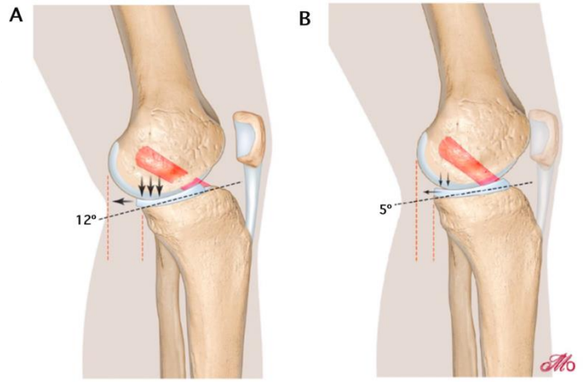

Conclusion

The effect of slope on weightbearing anterior tibial translation was greater in the ACL-injured population compared with the control cohort.

A reference SATT value should be considered in the preoperative planning of ACLR revision surgery when TDO is needed.

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