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No Impact of Graft Size or Time to Surgery on Anterior Tibial Translation Under Weight-Bearing Following ACL Reconstruction

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Faculty Disclosure Information

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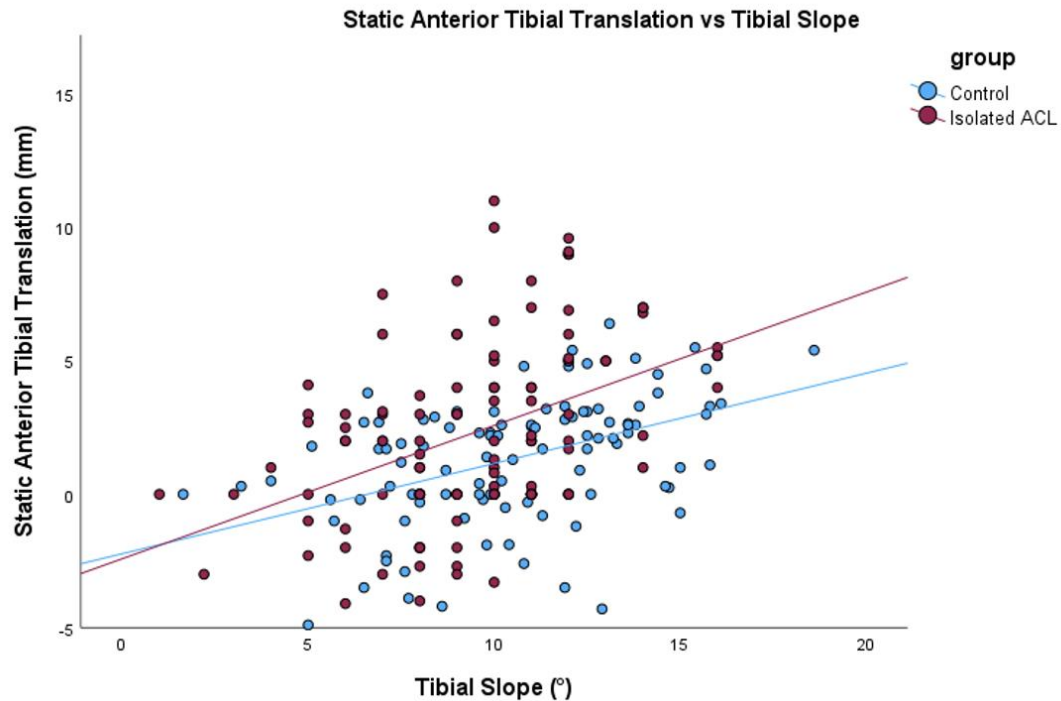


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Static Anterior Tibial Translation (SATT)



- Increased postoperative **SATT**:
 - Higher **stress** on ACL graft¹
 - Risk of graft **failure**²
- Only established method to **reduce SATT**^{3,4}
 - Tibial deflection osteotomy (**TDO**)

Objectives

1. Evaluate the impact of **graft size** on **postoperative SATT** and dynamic anterior tibial translation (**DATT**) in ACL reconstruction
2. Assess the correlation between **time from injury to surgery** and **SATT/DATT** changes

We hypothesized that neither graft size nor time to surgery significantly affects SATT or DATT

Methods



Retrospective (2020 – 2022)

Primary ACL reconstruction



Exclusion:

- Bone – Tendon – Bone graft
- Quad. Tendon graft
- Concomitant Osteotomy



X-rays institutional protocol
(Preoperative + Postoperative - 9 months)

- Lateral monopodal weight-bearing
- Telos x-rays (15 kg)



X-ray measurements
HOROs DICOM software
(version 3.3.6)

Methods



Figure 1. Posterior Tibial Slope (PTS)



Figure 2. Static Anterior Tibial Translation (SATT)

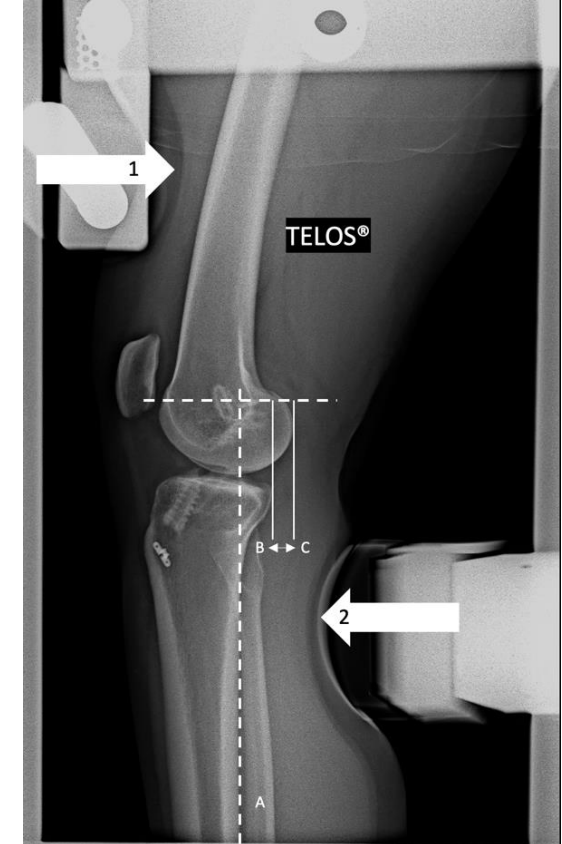


Figure 3. Dynamic Tibial Translation (DATT)
(Telos -15 kgs)

Results

Table 1. Demographics and Surgical Details

		Range
Gender, Male (%)	36 (54.5%)	
Side, R (%)	43 (65.2%)	
Age (years), mean (SD)	26.6 (8.5)	15 - 51
Time to Surgery (mo), median (IQR)	3.0 (8.0)	1 - 275
Graft Size (mm), mean (SD)	8.4 (1.12)	7.75 - 10
Meniscal Tear, n (%)		
MM	18 (27.3%)	
LM	20 (30.5%)	
Meniscal Treatment, n (%)		
MM Meniscectomy	4 (6%)	
MM Suture	14 (21.3%)	
LM Meniscectomy	5 (7.6%)	
LM Suture	15 (22.7%)	
PTS (°), mean (SD)	9.53 (2.73)	0 - 17
Preop SATT (mm), mean (SD)	2.41 (2.98)	- 5 - 9.5
Preop DATT (mm), mean (SD)	9.09 (3.19)	3 - 19
Postop SATT (mm), mean (SD)	2.14 (2.47)	- 3.5 - 7.4
Postop DATT (mm), mean (SD)	5.28 (2.55)	0 - 10.6
Δ SATT, mean (SD)	0.27 (3.15)	- 9.8 - 7.8
Δ DATT, mean (SD)	-3.8 (3.32)	- 11.7 - 3.2

R=Right; SD= Standard Deviation; mo = months; IQR = Interquartile Range; MM = Medial Meniscus (Includes tear, ramp and root lesions); LM = Lateral Meniscus (Includes tear and root lesions); PTS = Posterior Tibial Slope; SATT= Static Anterior Tibial Translation; DATT= Dynamic Anterior Tibial Translation; Δ = Postoperative - Preoperative Difference.

Discussion

Key Findings

- Graft size and time to surgery do not significantly affect SATT or DATT.
- ACL reconstruction effectively reduces DATT but has no impact on SATT.
- Persistent anterior laxity remains a risk factor for graft failure.

Discussion

Clinical Relevance

- Larger grafts (>9 mm) vs. smaller grafts (<8 mm) → **No significant difference** in SATT reduction.
- **Time from injury to surgery** does **not** determine postoperative SATT changes.
- Meniscal integrity may influence DATT, but its role in SATT remains unclear.
- **TDO** remains the **gold standard** for reducing SATT.

Conclusion

1. **Graft size** and **time to surgery** do **not** significantly affect **postoperative SATT** or **DATT**.
2. **Preoperative SATT** and **DATT** should **not** be an indication for using **larger grafts**.
3. Other factors influencing SATT reduction need **further investigation**.

References

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