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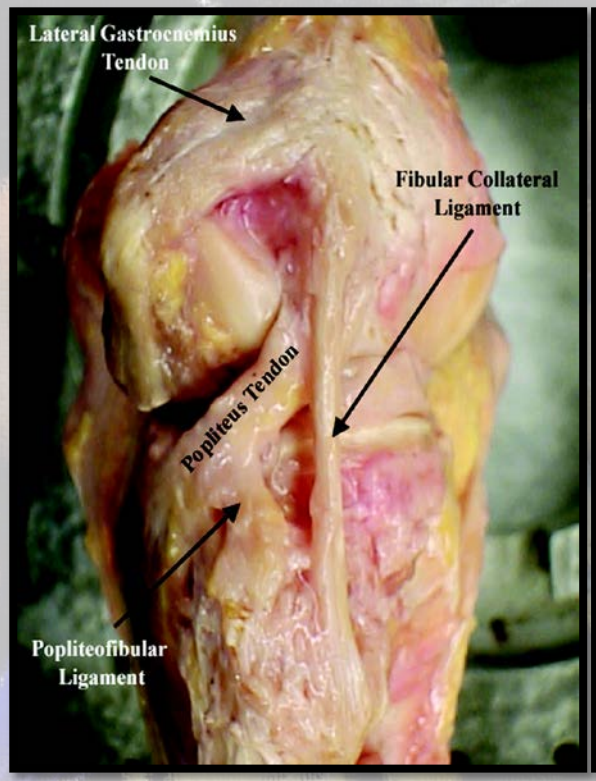
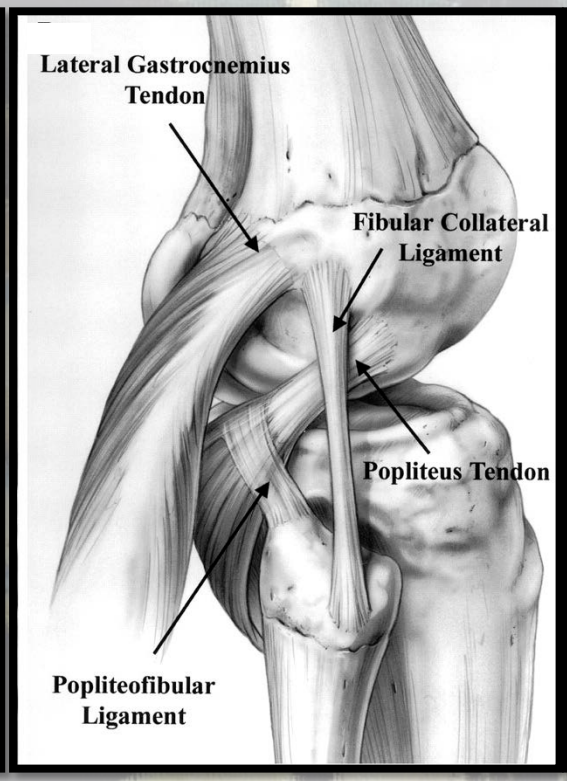
ARCIERO VS. LAPRADE: A BIOMECHANICAL COMPARISON OF TWO TECHNIQUES FOR KNEE POSTEROLATERAL CORNER RECONSTRUCTION

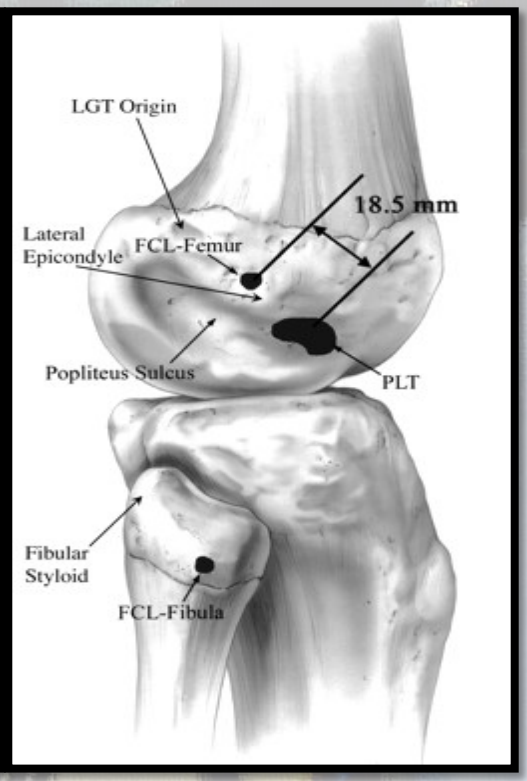
Gabriel Ortiz, G. Keith Gill, Heather Menzer, Dustin Richter, Paul Johnson, Robert Schenck, Gehron Treme, Fares Qeadan, Christina Salas

THE POSTEROLATERAL CORNER

The purpose of this study is to biomechanically compare the effectiveness of restoring stability to a deficient Posterolateral Corner (PLC) using two different PLC reconstruction techniques: Arciero and LaPrade.







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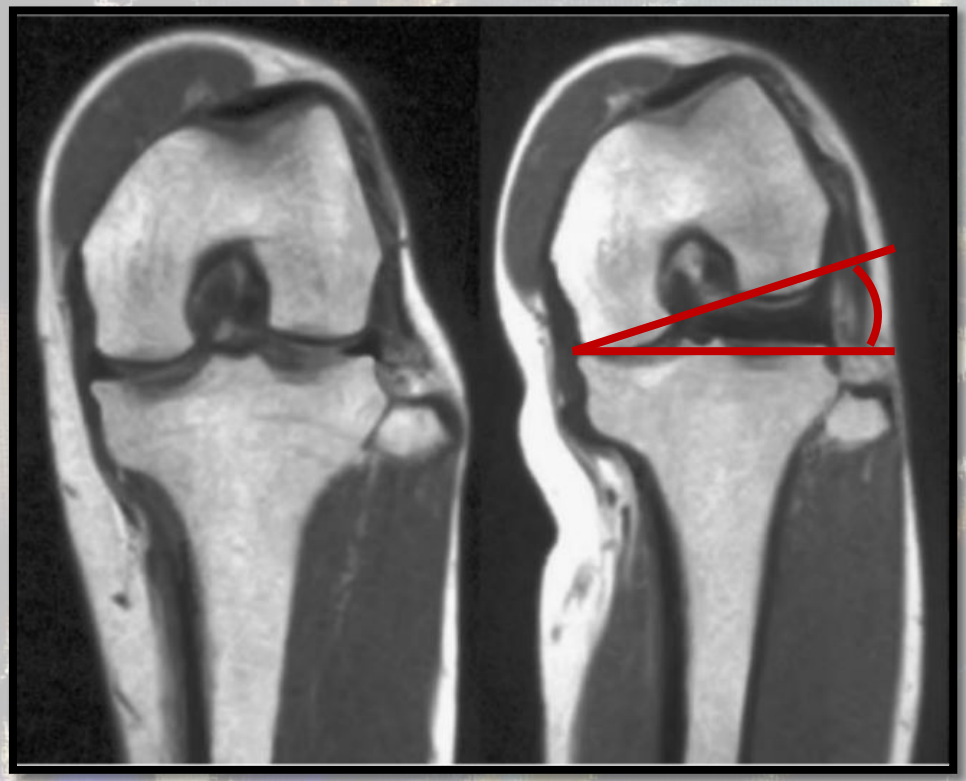
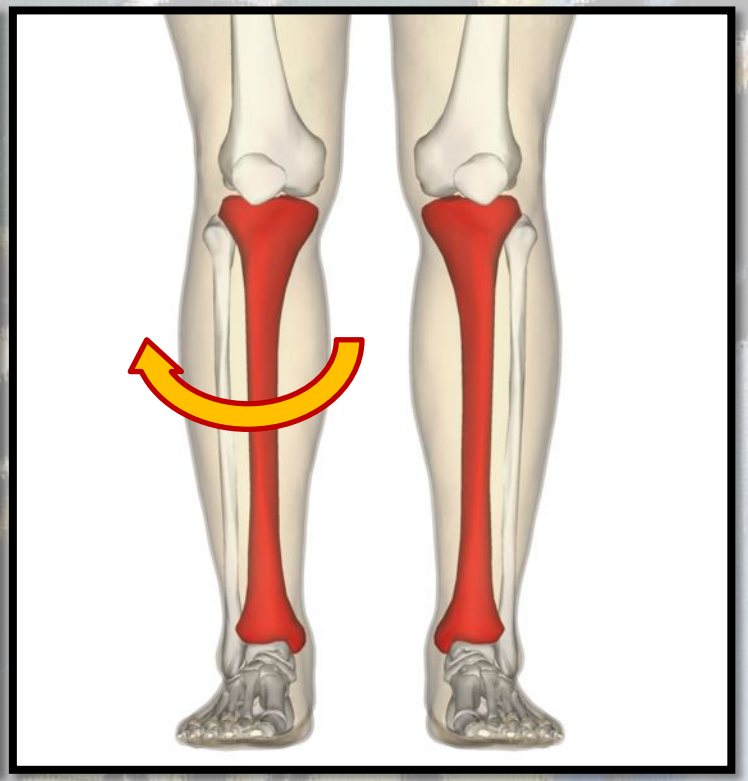
EXTERNAL ROTATION & VARUS ANGULATION



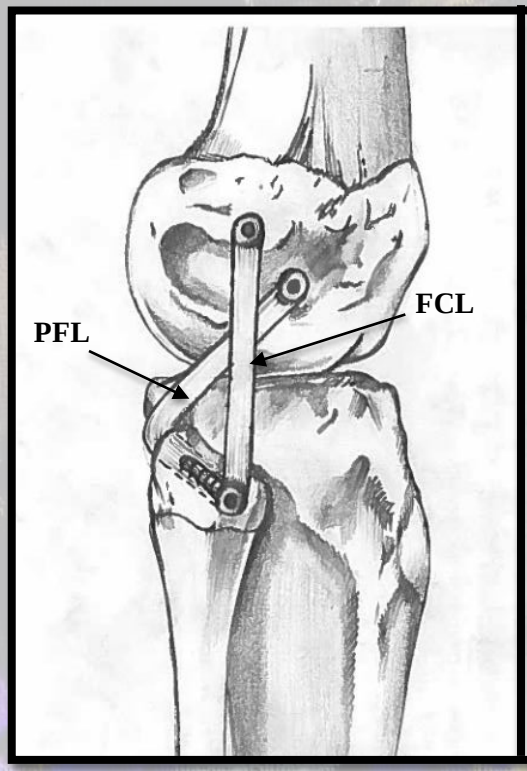
Varus Angulation

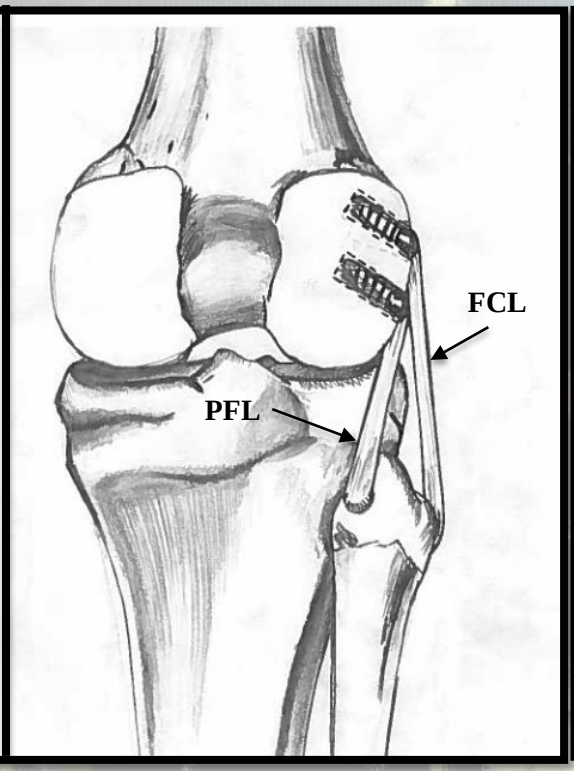


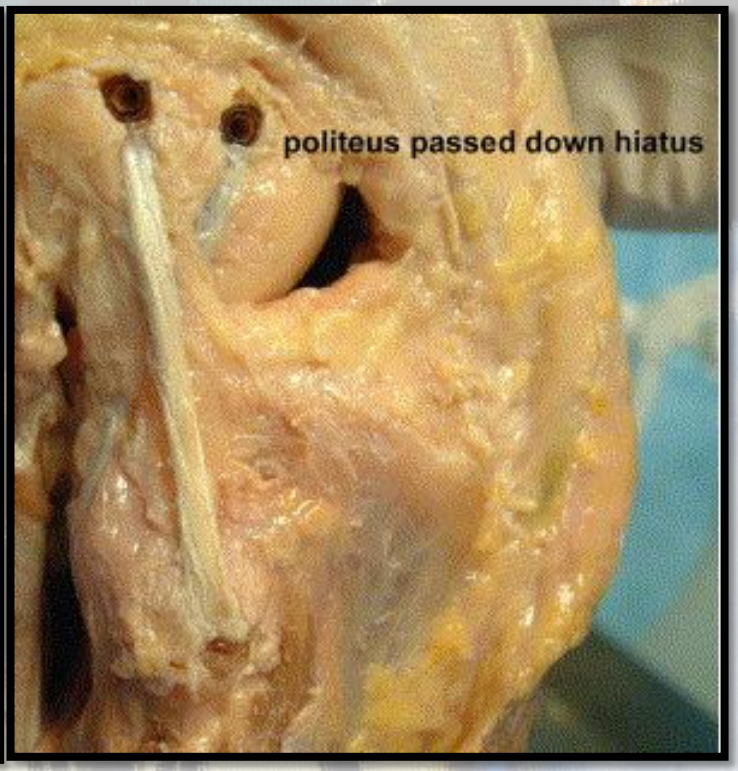
External Rotation

ARCIERO RECONSTRUCTION

The Arciero Reconstruction is distinguished by two femoral sockets and one fibular tunnel using a single graft to reconstruct the FCL and PFL.

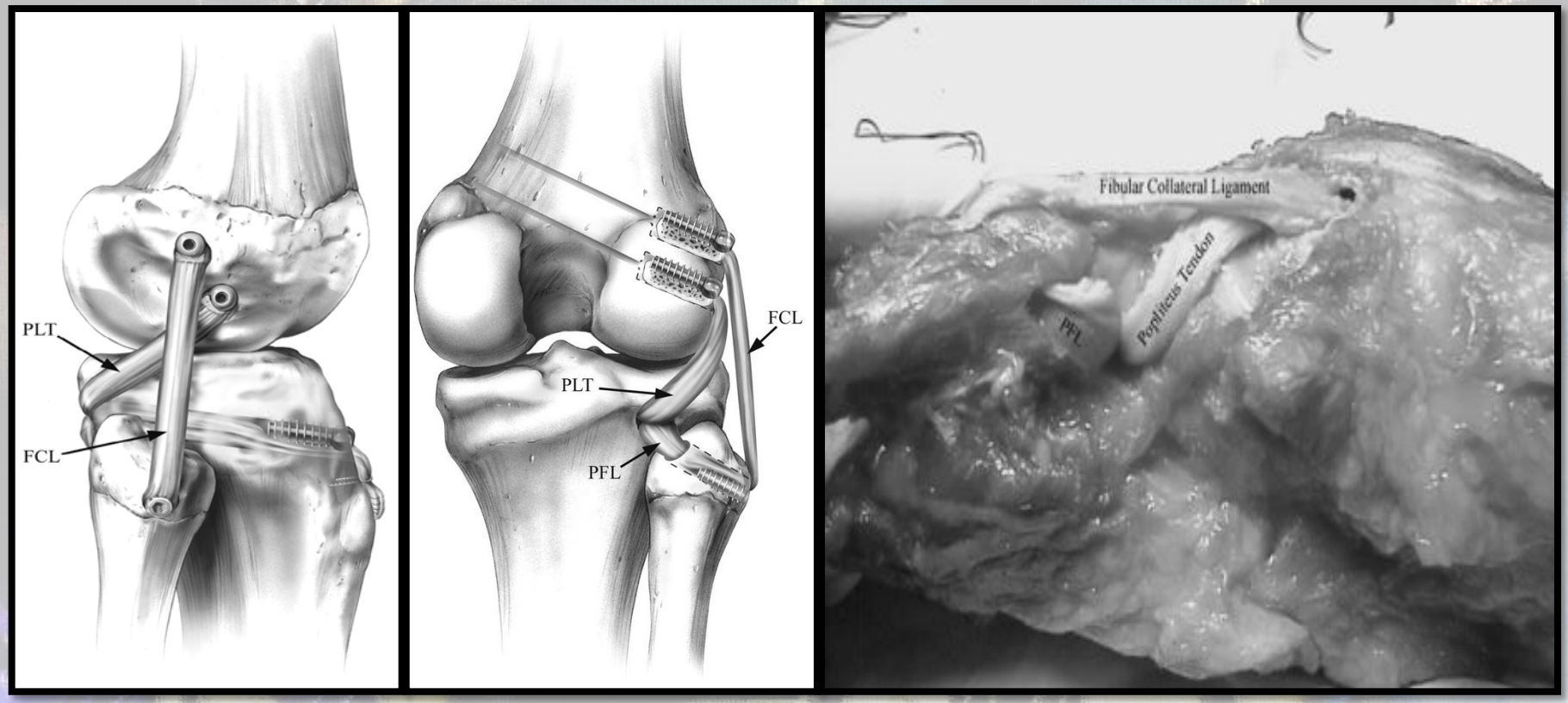






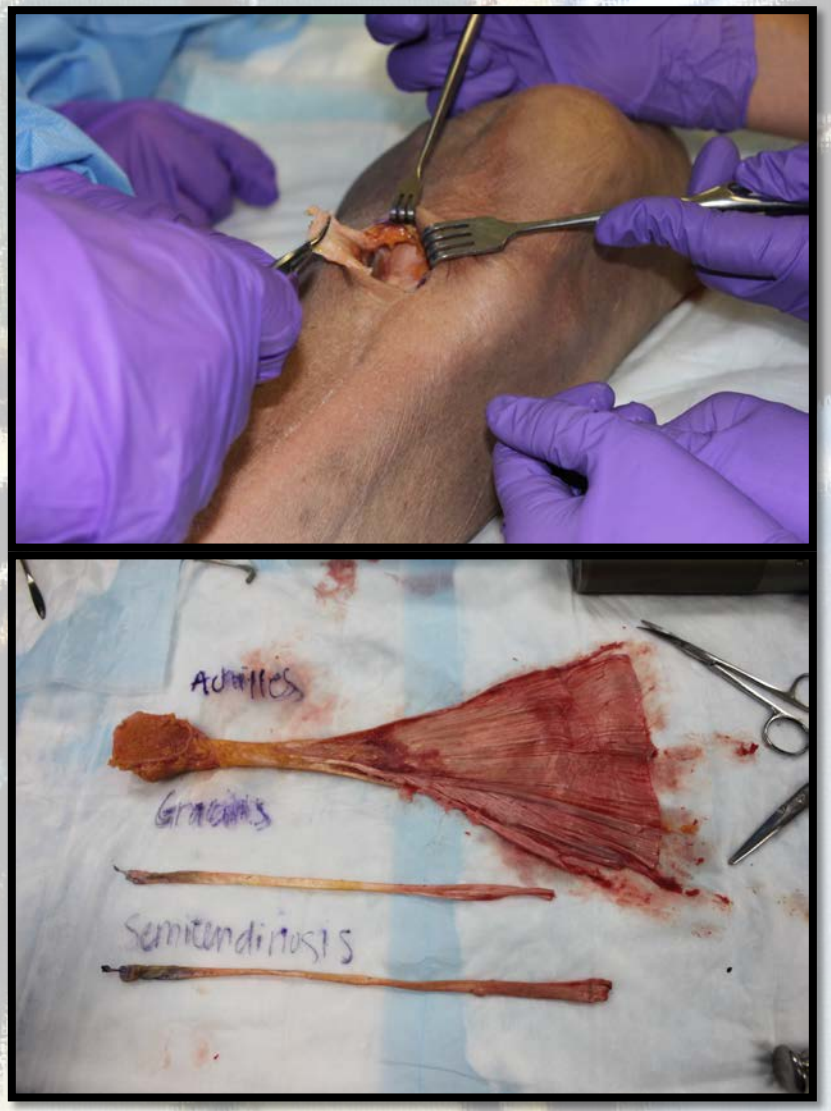
LAPRADE RECONSTRUCTION

The LaPrade PLC Reconstruction is distinguished by two femoral sockets, one fibular tunnel, and a tibial tunnel using two grafts to reconstruct the FCL, PLT, and PFL.



SPECIMEN PREPARATION

- **Ten matched paired fresh frozen cadaveric specimens from mid femur to foot were used.**
- **Trained orthopaedic surgeons harvested the Achilles, Gracilis, and Semitendinosus tendons.**
- **Skin and subcutaneous fat was removed.**
- **Disarticulation was performed at the ankle joint for each specimen.**
- **The articular surface of the distal tibia was reamed.**

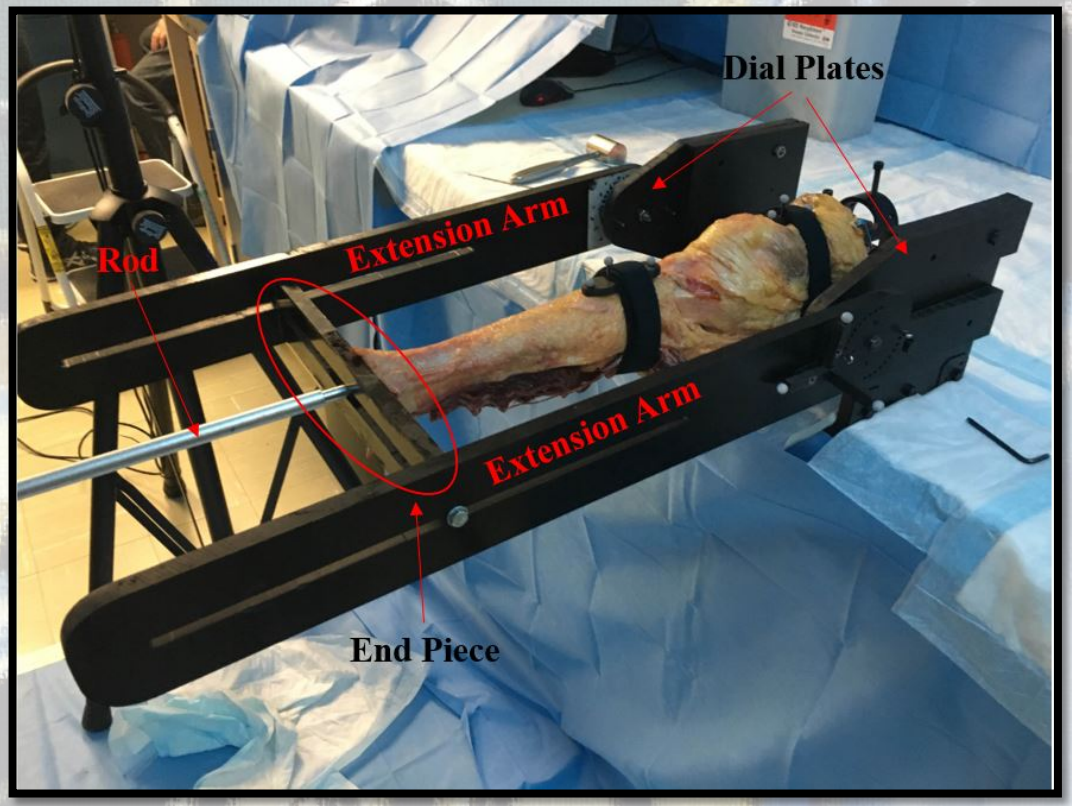


MATERIALS AND METHODS

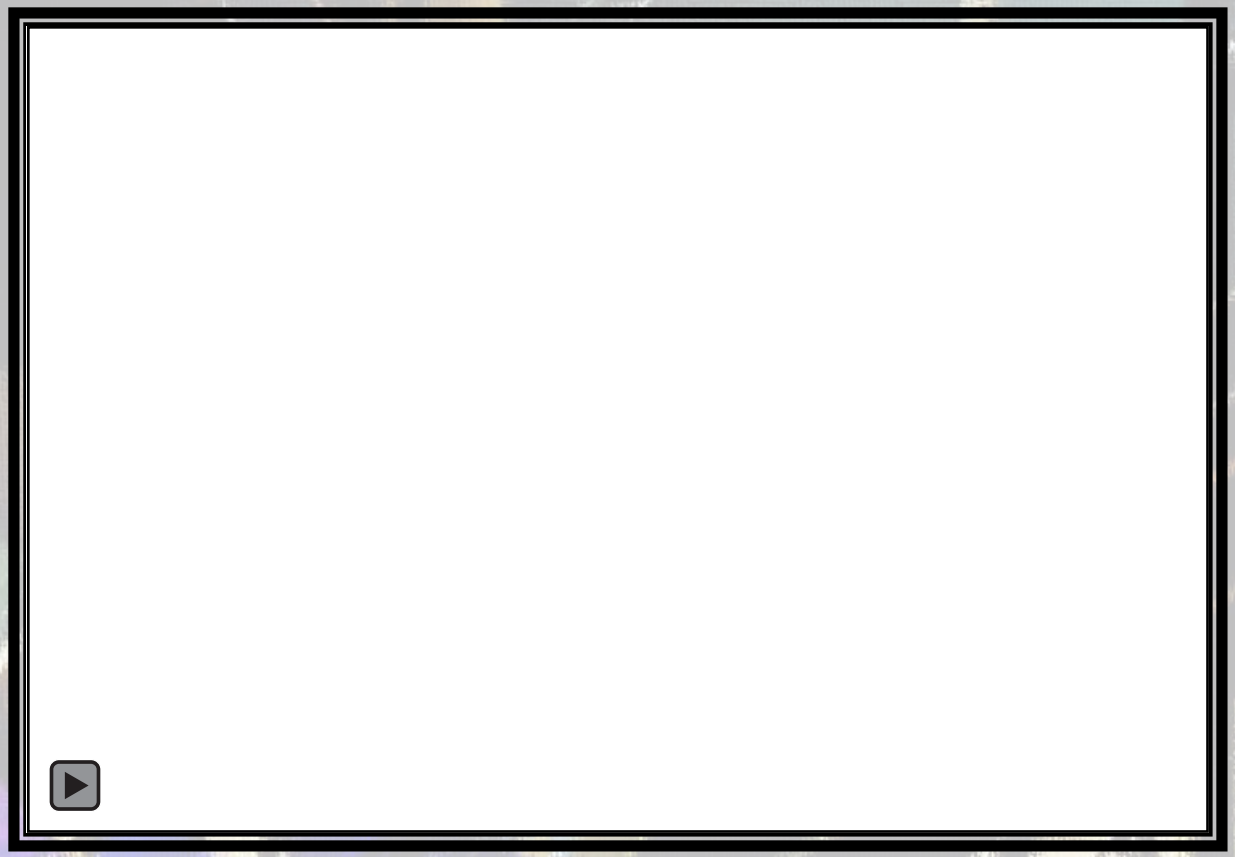
- A custom made testing fixture was created to isolate and test for 10 Nm varus angulation (VA) and 5 Nm external rotation (ER).

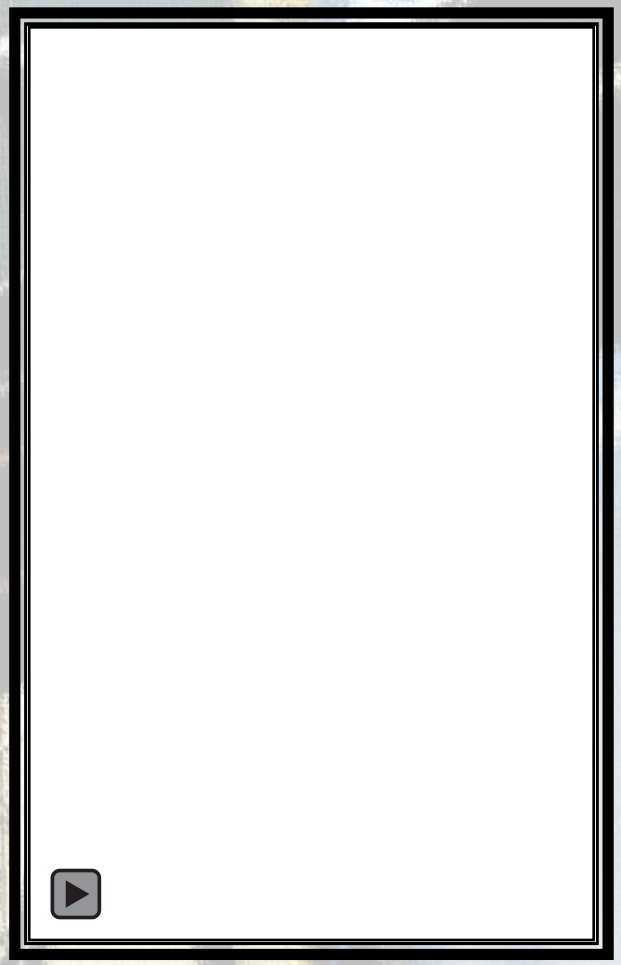
- Adjustable to 0^0, 20^0, 30^0, 60^0, and 90^0 degrees of knee flexion.

- Optitrack high resolution motion capture system used to measure tibial ER and VA.

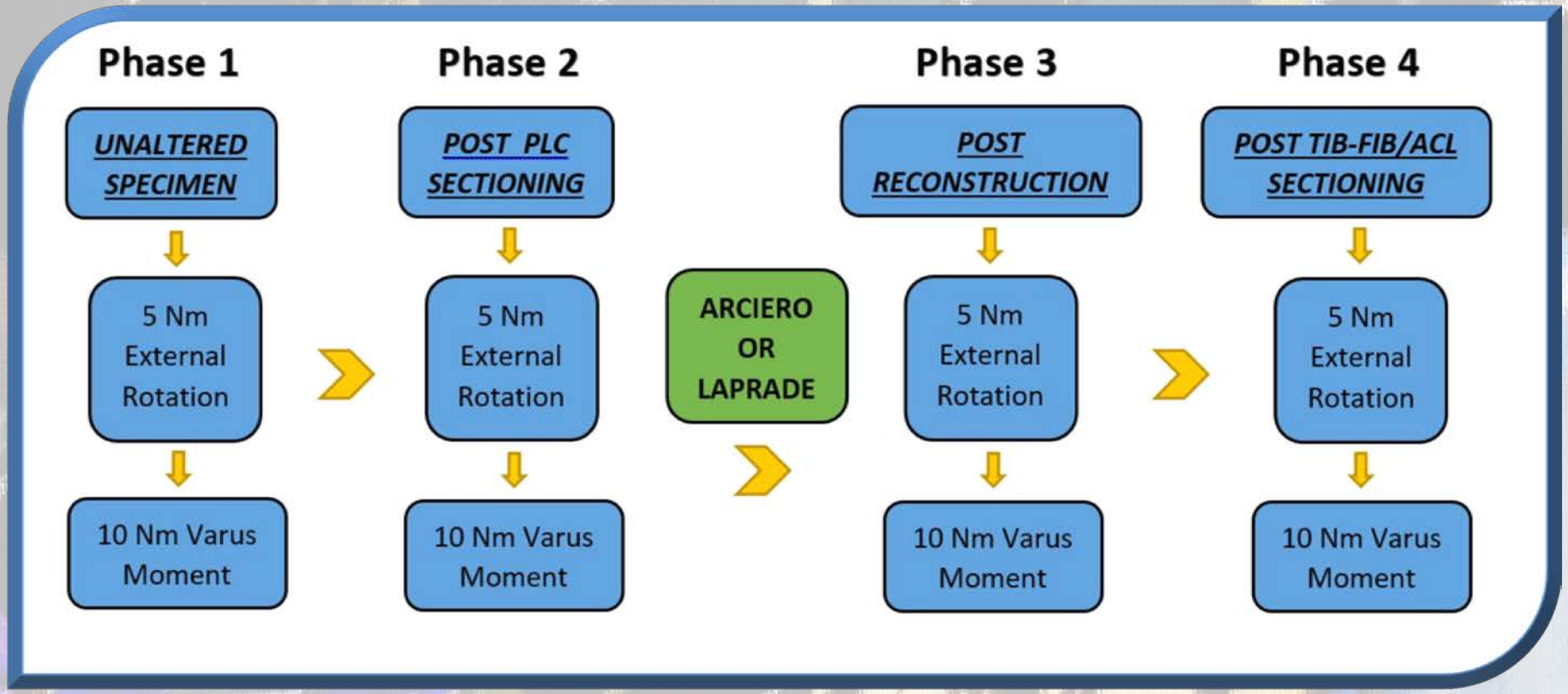


VA & ER APPLICATION

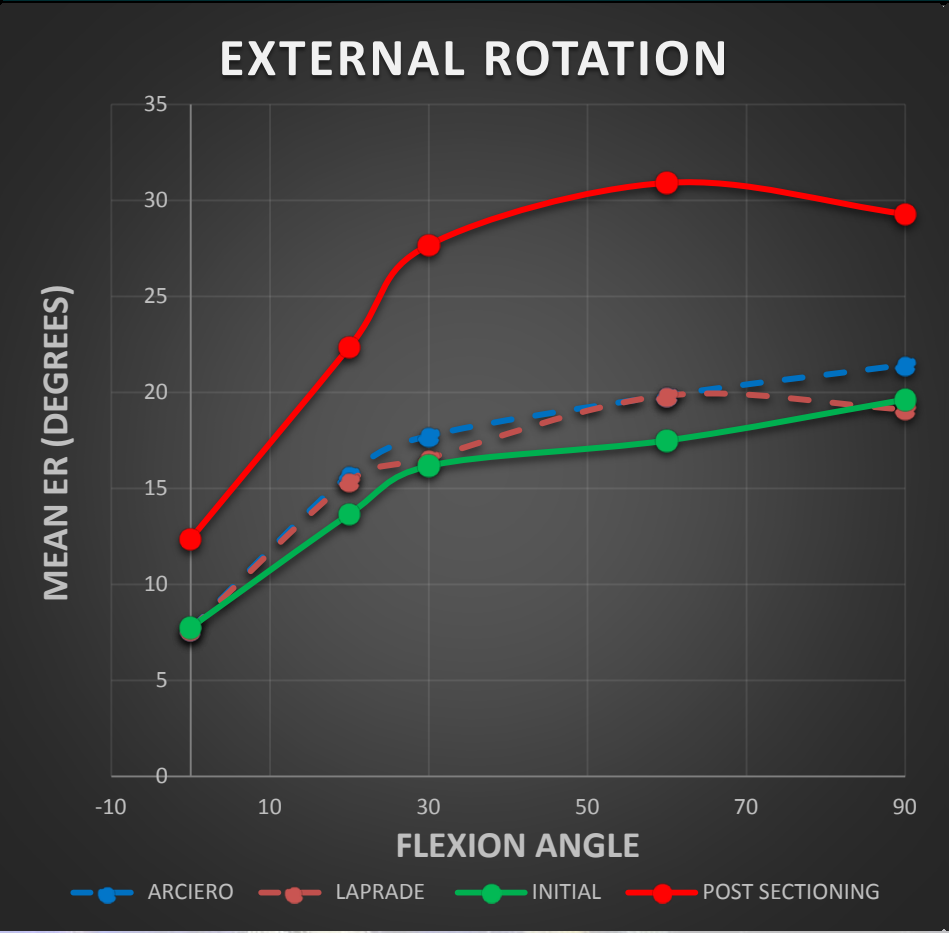


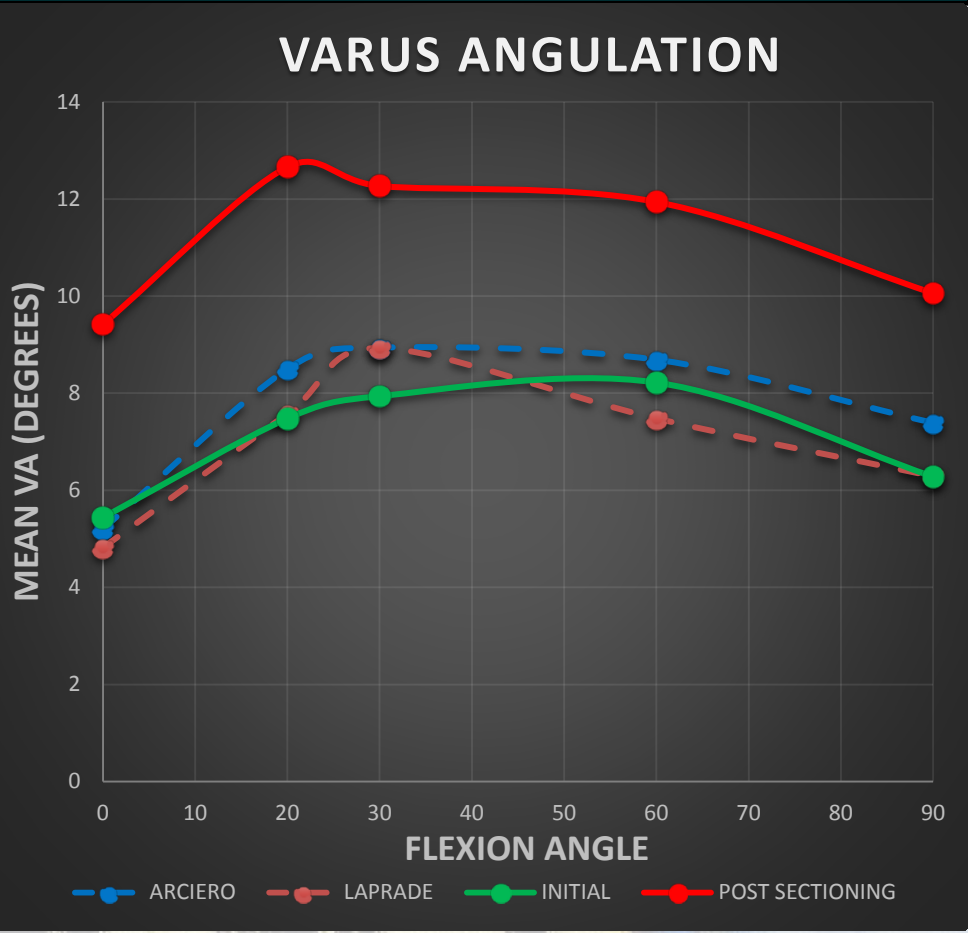


TESTING PROTOCOL



INITIAL & POST SECTIONING VS. ARCIERO & LAPRADE SPECIMENS AT POST RECONSTRUCTION





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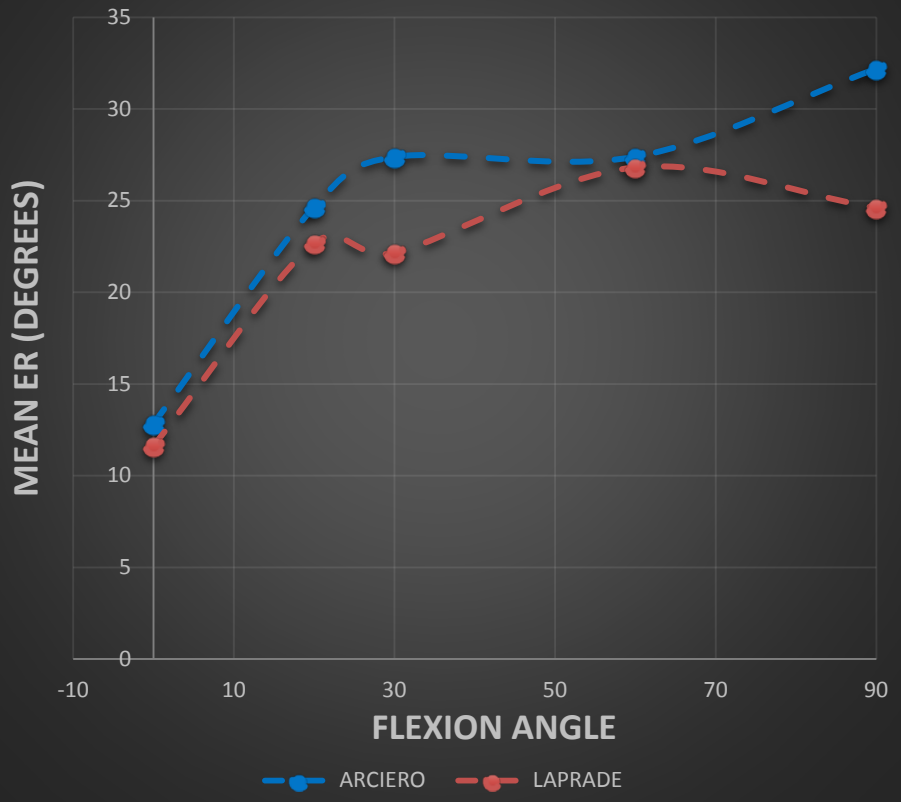
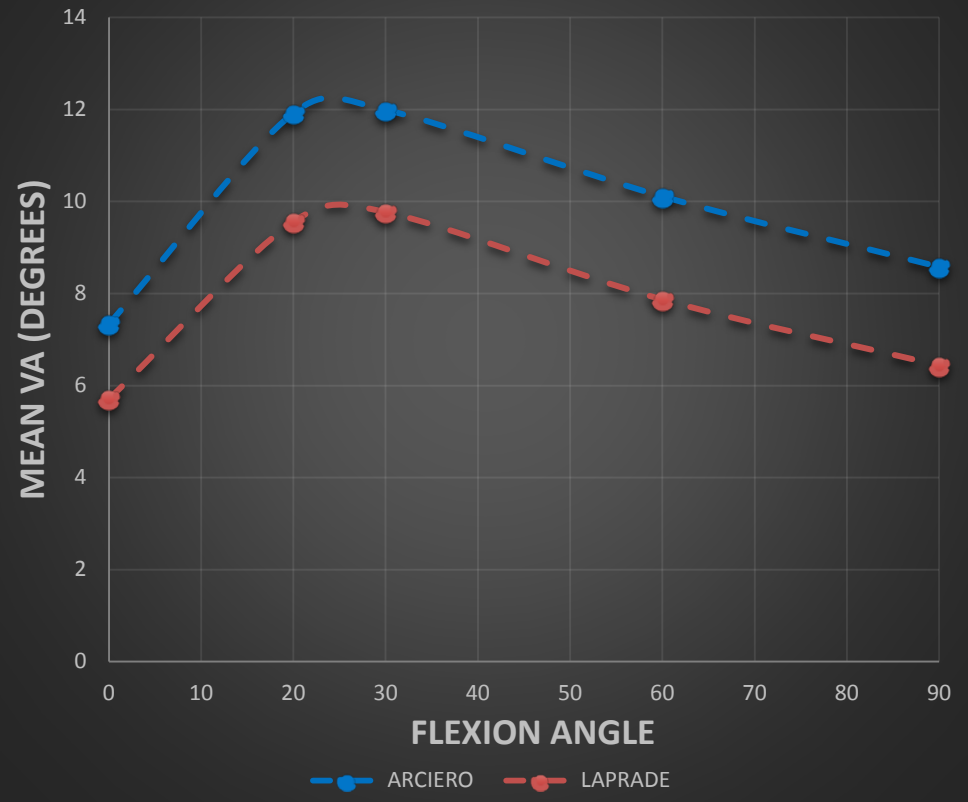
POST TIB-FIB SECTIONING





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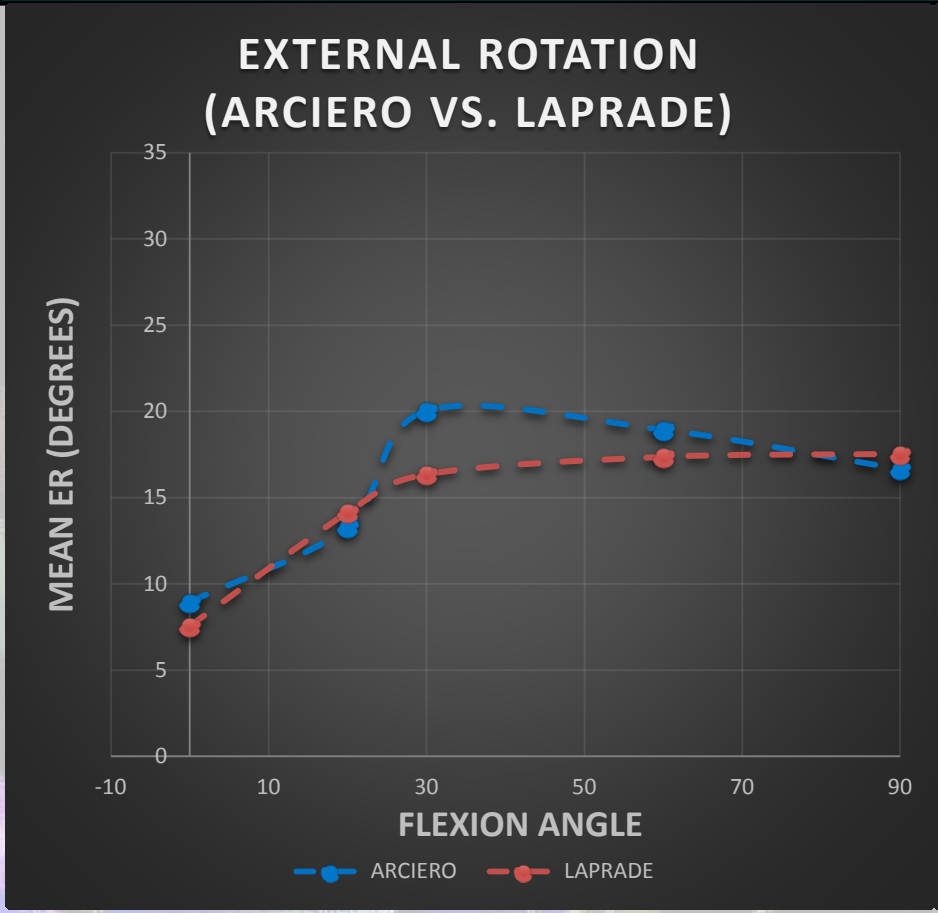
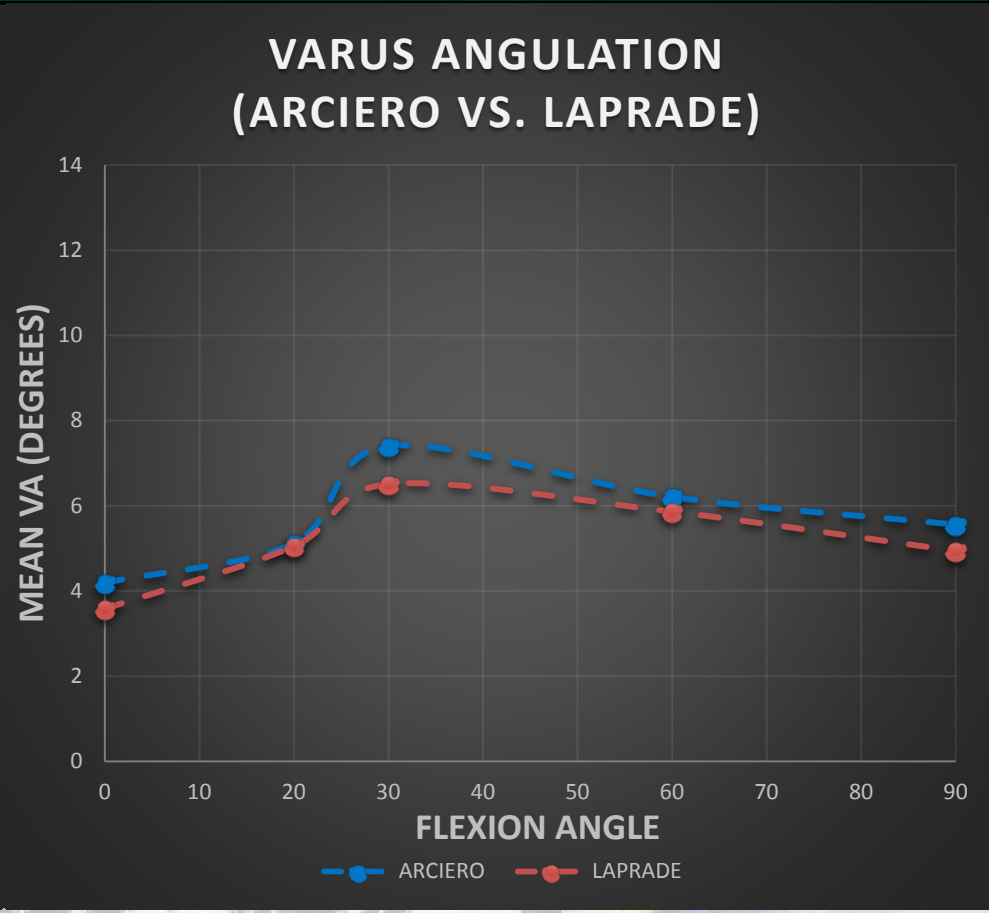
POST ACL SECTIONING





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TOTAL OF INSTANCES

OVERALL ER (17/17)		
Flexion Angle	LaPrade Counts	Arciero Counts
0	**11**	6
20	**11**	6
30	**12**	5
60	**9**	8
90	**9**	8

External Rotation

OVERALL VA (17/17)		
Flexion Angle	LaPrade Counts	Arciero Counts
0	**13**	4
20	**12**	5
30	**11**	6
60	**11**	6
90	**12**	5

Varus Angulation

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DISCUSSION

- **The greatest difference between the Arciero and LaPrade techniques were at the post tib-fib sectioning phase of the study. Specifically in VA.**
- **A positive post-hoc parallel profile test at all phases of the study was found indicating that a larger sample size may reveal a statistical difference.**
- **The LaPrade technique showed slightly better outcome measures at all phases of the study.**
- **No statistical significance was found between the Arciero and LaPrade reconstructions.**

LIMITATIONS

- **A cadaveric study such as this will never be able to truly simulate in vivo conditions.**
- **Particularly, graft healing and maturation is vital to the reconstruction.**
- **The age of the matched pairs used were all greater than 65 years of age. The strength of the their respective PLC's and allografts are not reflective of optimal healthy patients.**
- **The study is underpowered due to low sample size and inability to detect significance.**

CONCLUSIONS

- **We can conclude no statistical difference between the Arciero and LaPrade techniques at post reconstruction.**

- **This allows surgeons to select the technique they prefer based on their preference and training without concern of surgical outcomes affecting PLC stability.**

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