ISAKOS CONGRESS 2023

Boston Massachusetts June 18–June 21

Lateral tibial cartilage slope and meniscal geometry in patients with and without ACL injury

Steffen Sauer, MD Aleris Hospital Aarhus, Denmark

George Tsironis, MD Team Physician Werder Bremen, Germany

ISAKOS CONGRESS 2023

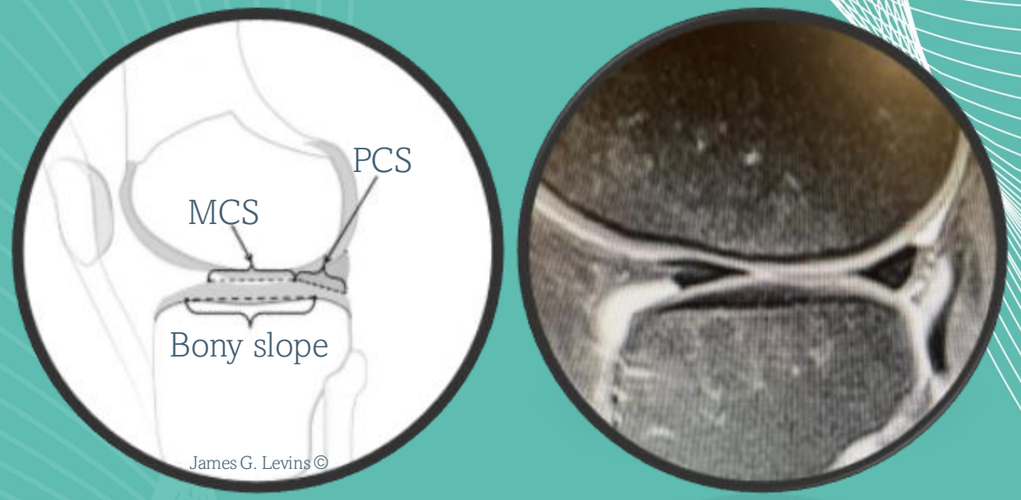
Boston
Massachusetts
June 18–June 21

Disclosures: None

Lateral tibial cartilage slope and meniscal geometry in patients with and without ACL injury

Background

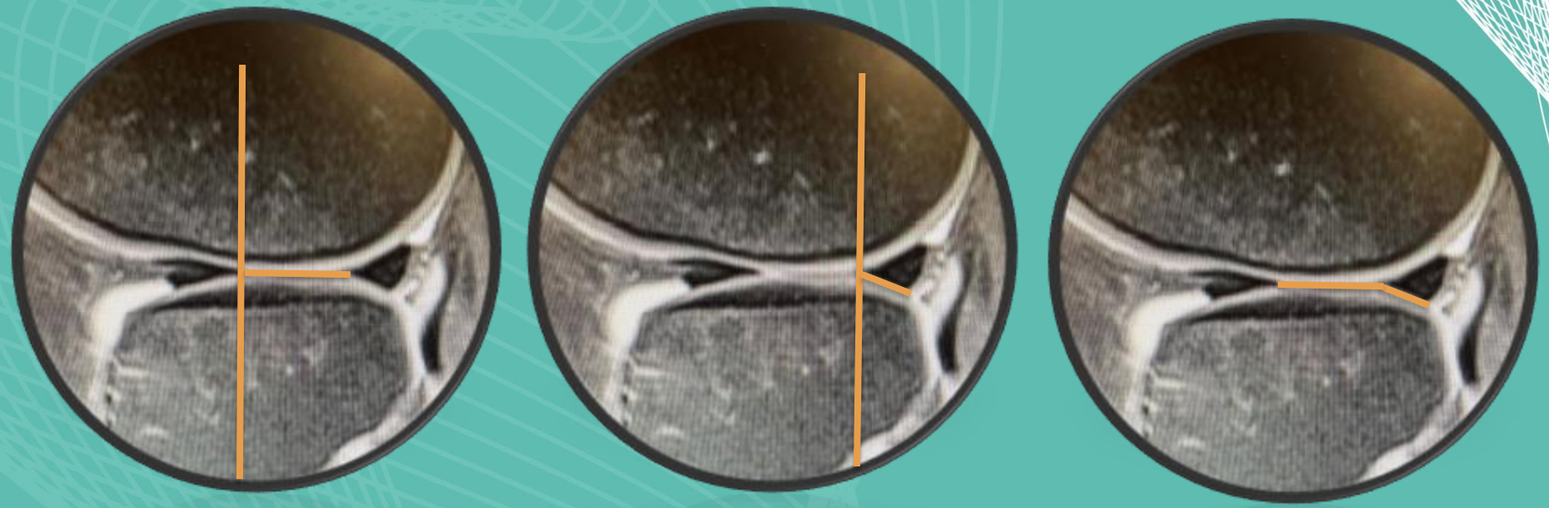
- ACL deficient knees undergo changes in cartilage slopes shortly after ACL injury.
- With internal tibial rotation, the lateral tibiofemoral contact area is moved from the middle tibial cartilage slope towards the steeper posterior tibial cartilage slope.
- Middle (MCS) and posterior (PCS) tibial cartilage slopes may therefore have independent roles regarding the risk of ACL injury.



Lateral tibial cartilage slope and meniscal geometry in patients with and without ACL injury

Material and Methods:

- 50 consecutive patients with isolated ACL injury were matched according to age, sex and BMI.
- Middle tibial cartilage slope (MCS), posterior tibial cartilage slope (PCS), meniscal slope (MS), meniscal wedge angle (MWA), and cartilage slope angulation (MCS-PCS) were measured on MRI.



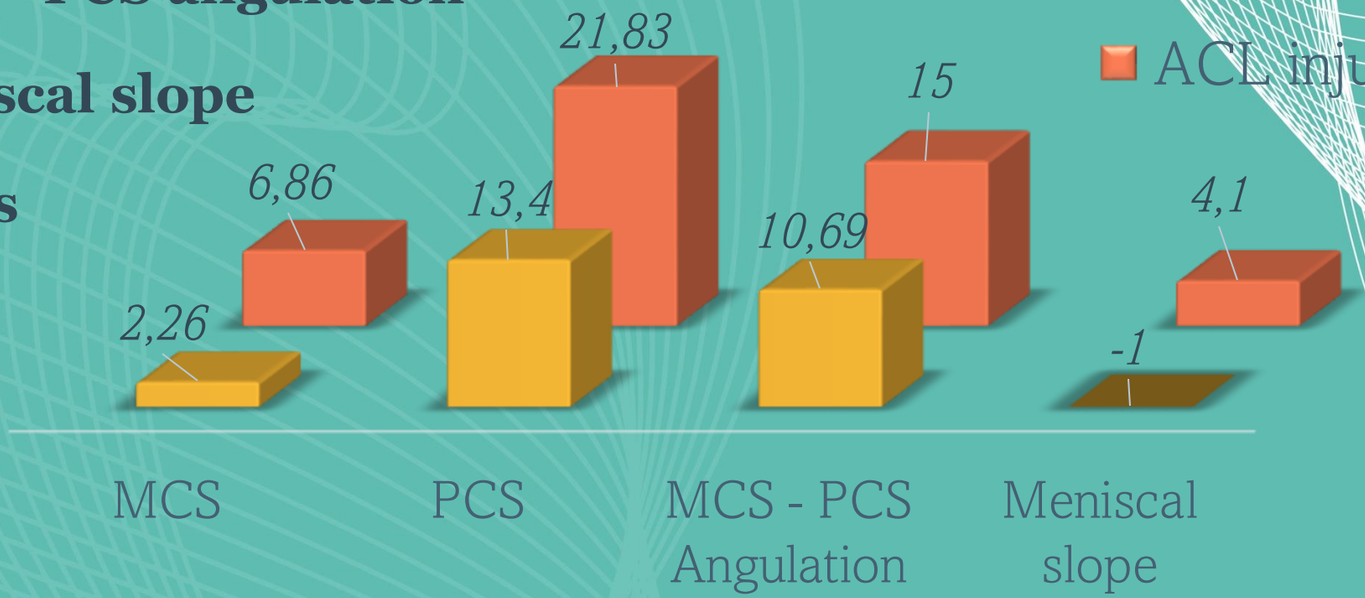
MCS PCS MCS-PCS Ang.

Lateral tibial cartilage slope and meniscal geometry in patients with and without ACL injury

Results:

- **ACL injured knees showed …**
  - **significantly increased middle (MCS) and posterior lateral tibial cartilage slope (PCS)**
  - **significantly increased MCS – PCS angulation**
  - **significantly increased meniscal slope**

… compared to ACL intact knees



Lateral tibial cartilage slope and meniscal geometry in patients with and without ACL injury

Conclusion

- ACL deficient knees showed increased middle and posterior cartilage slopes as well as increased cartilage slope angulation compared to ACL intact knees.
- The resulting steeper drop-off may influence the risk of ACLR failure.

Lateral tibial cartilage slope and meniscal geometry in patients with and without ACL injury

References

- Hudek R, Schmutz S, Regenfelder F, Fuchs B, Koch PP. Novel measurement technique of the tibial slope on conventional MRI. Clin Orthop Relat Res. 2009 Aug;467(8):2066-72. doi: 10.1007/s11999-009-0711-3. Epub 2009 Feb 4. PMID: 19190973; PMCID: PMC2706341.

- Korthaus A, Krause M, Pagenstert G, Warncke M, Brembach F, Frosch KH, Kolb JP. Tibial slope in the posterolateral quadrant with and without ACL injury. Arch Orthop Trauma Surg. 2022 Dec;142(12):3917-3925. doi: 10.1007/s00402-021-04298-w. Epub 2021 Dec 28. PMID: 34964068; PMCID: PMC9596559.

- Sturnick DR, Van Gorder R, Vacek PM, DeSarno MJ, Gardner-Morse MG, Tourville TW, Slauterbeck JR, Johnson RJ, Shultz SJ, Beynnon BD. Tibial articular cartilage and meniscus geometries combine to influence female risk of anterior cruciate ligament injury. J Orthop Res. 2014 Nov;32(11):1487-94. doi: 10.1002/jor.22702. Epub 2014 Aug 6. PMID: 25099246; PMCID: PMC6886124.