DOES CARTILAGE THICKNESS CHANGE DIFFER BETWEEN ACL DEFICIENT KNEES WITH AND WITHOUT RECONSTRUCTION SURGERY?

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Disclosures

- Wolfgang Wirth: Freelancer for Chondrometrics GmbH, Ainring, Germany; Share-holder of Chondrometrics GmbH, Ainring, Germany; Received consulting fees from Merck Serono S.A.
- Martin Hudelmaier: Part-time employment with Chondrometrics GmbH
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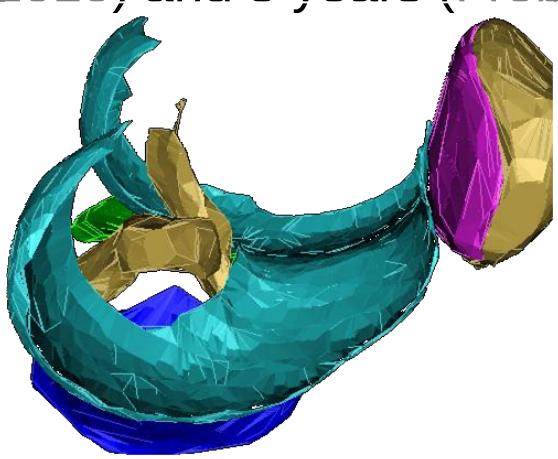
- Stefan Lohmander & Richard Frobell: No disclosures

Anterior cruciate ligament (ACL) tears

- ACL tear is a serious and common injury
- Surgical ACL reconstruction is frequently perfomed in ACL deficient knees
- ACL injuries associated with elevated risk of developing knee OA

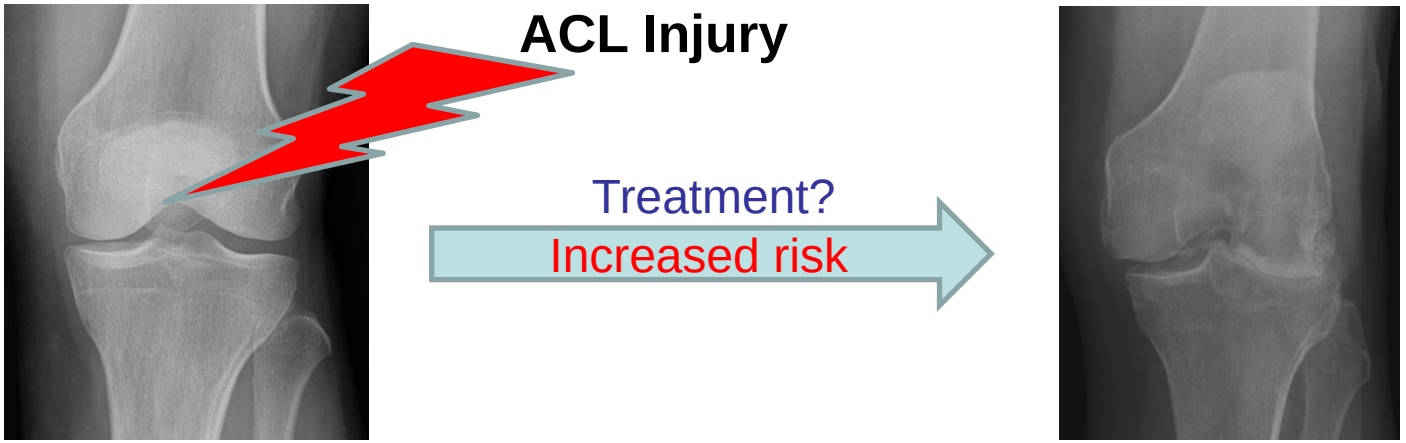
The KANON trial

- Comparison of surgical vs. non-surgical treatment in young, active adults with rotational trauma to previously uninjured knee
- Randomization to either:
  - » early ACL reconstruction and structured rehabilitation or
  - » structured rehabilitation with optional delayed ACL reconstruction
- Primary objective: Patient reported outcomes (Knee injury and Osteoarthritis Outcome Score, KOOS)
- No significant differences in patient reported outcomes after 2 (Frobell et al. N Engl. J. Med. 2010) and 5 years (Frobell et al. BMJ 2013).



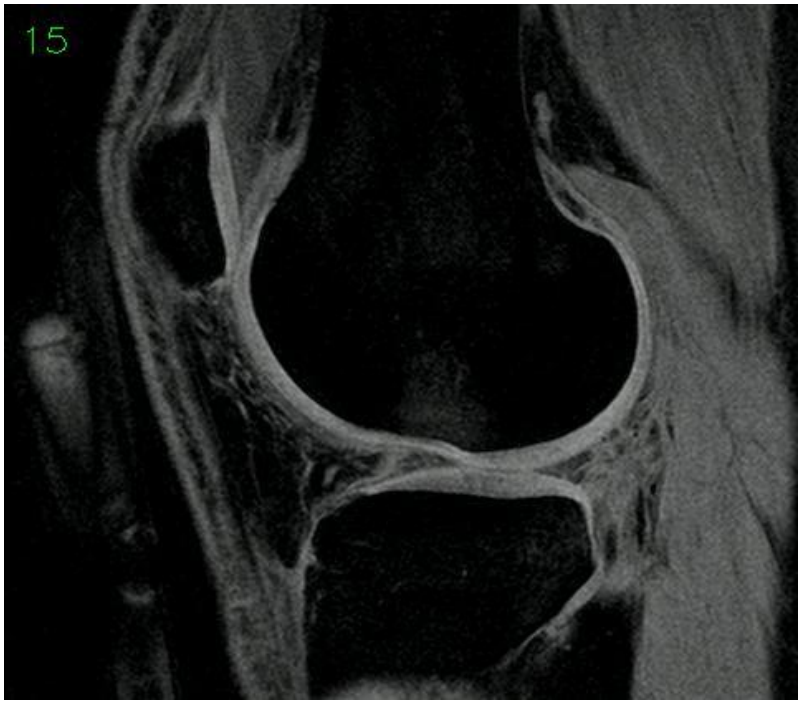
Objectives

- Does the treatment of the initial injury influence change in femorotibial cartilage thickness over the first five years after injury?
  - » Change in cartilage thickness in the initial two-year period
  - » Change in cartilage thickness in the subsequent three-year period



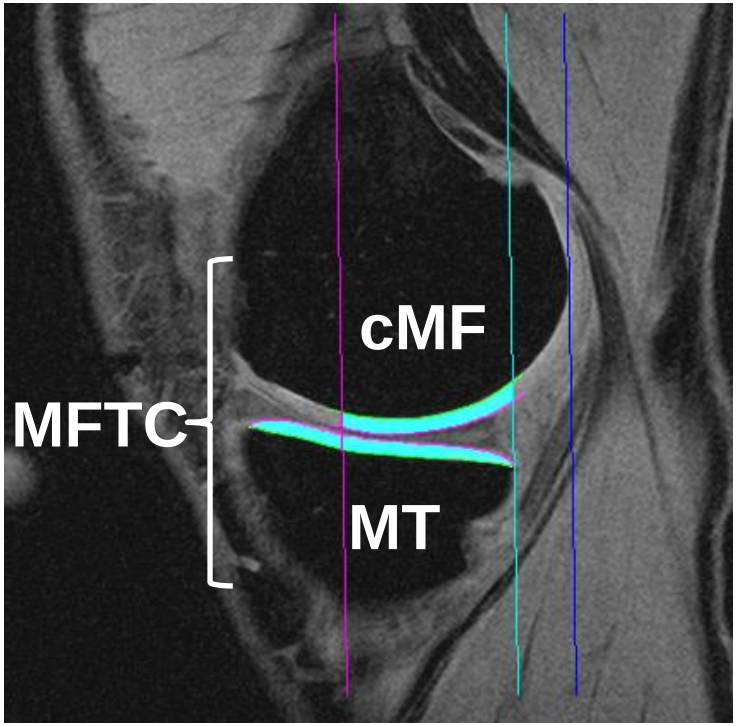
Study participants

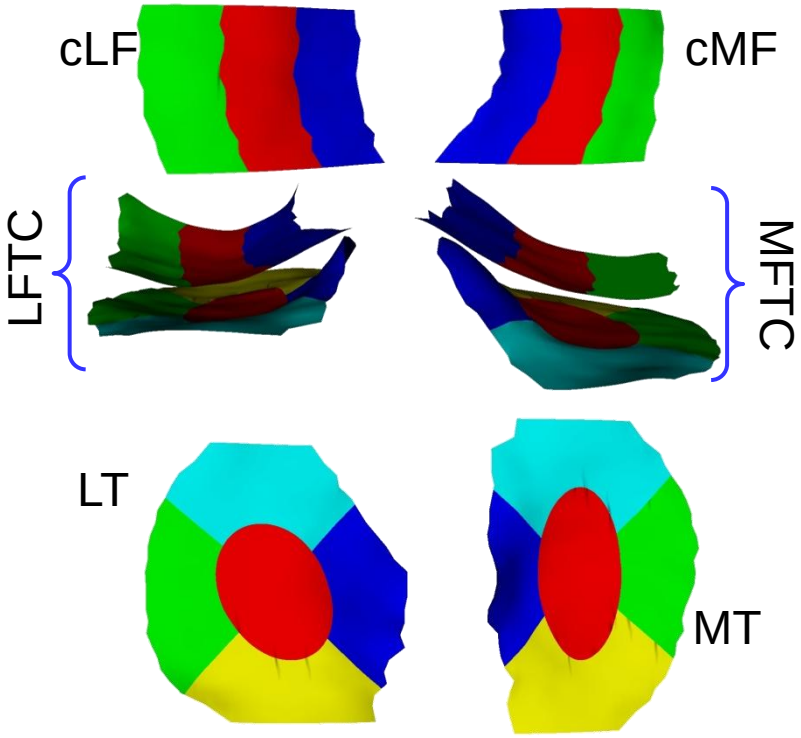
- 106 of 121 participants with complete MRI and clinical data
- Demographics at baseline (BL):
  - » 26 female and 80 male participants
  - » Age: 26.4 ± 4.8 years
  - » BMI: 24.2 ± 2.9 kg/m^2
- Image acquisition at visits:
  - » Recruitment (BL = baseline)
  - » Year 2 (Y2) follow-up
  - » Year 5 (Y5) follow-up
- Sagittal FLASH (1.5T, 0.29mm IPR, 1.5mm slice spacing)



Cartilage segmentation & computation

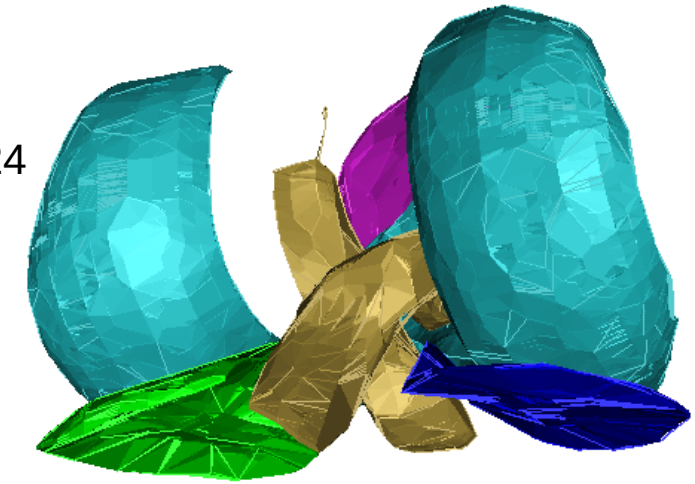
- Manual segmentation of cartilages:
  - » Medial and lateral tibia (MT/LT)
  - » Central 75% of the medial and lateral femoral condyle (cMF/cLF)
- Computation of cartilage thickness in cartilage plates and subregions





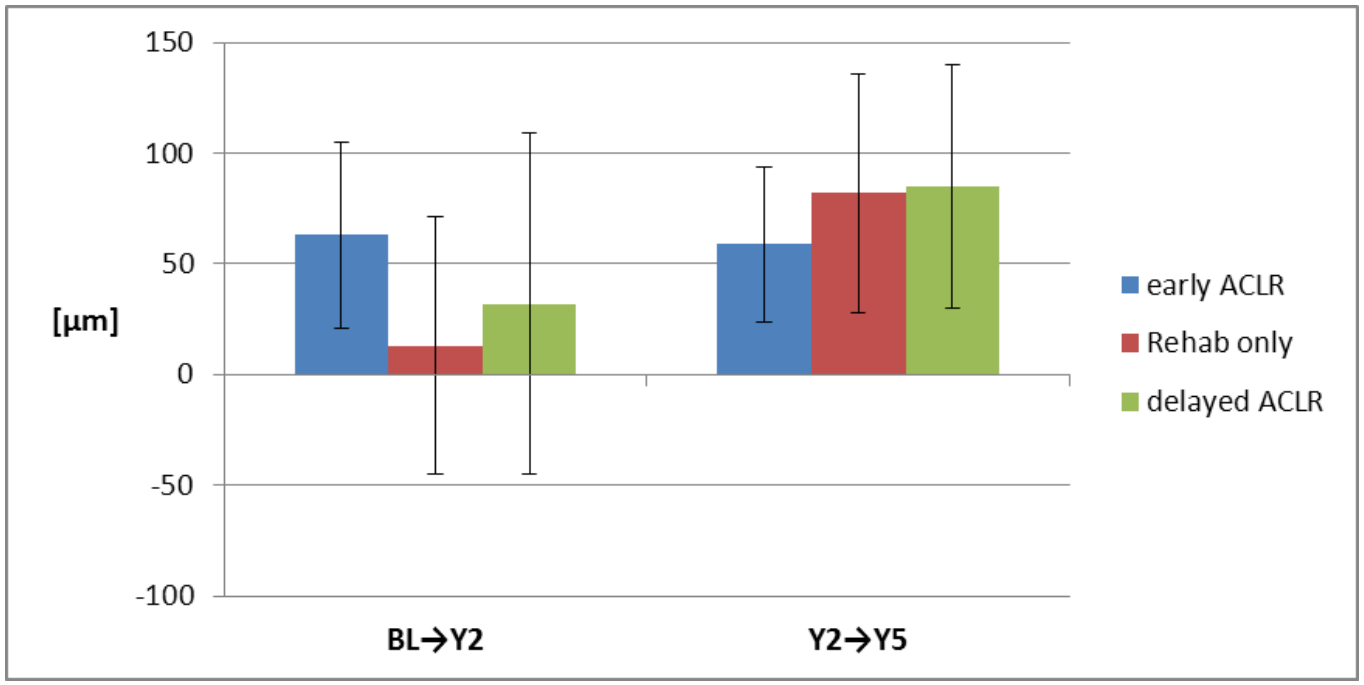
Statistical analysis

- Primary outcome: Change in medial femorotibial compartment (MFTC)
- Secondary outcomes: Ordered values 1 (subregion with the most negative change within each knee) and 16 (subregion with the most positive change within each knee)
- Observation periods:
  - » Baseline → Year 2 (BL→Y2)
  - » Year 2 → Year 5 (Y2→Y5)
- As-treated analysis:
  - » Early ACL reconstruction: N=57
  - » Delayed ACLR: N=25
  - » Rehabilitation only (no ACL reconstruction): N=24
- T-test (crude analysis)
- Analysis of covariance (analysis with adjustment for age, sex & BMI)



Medial femorotibial compartment (MFTC)

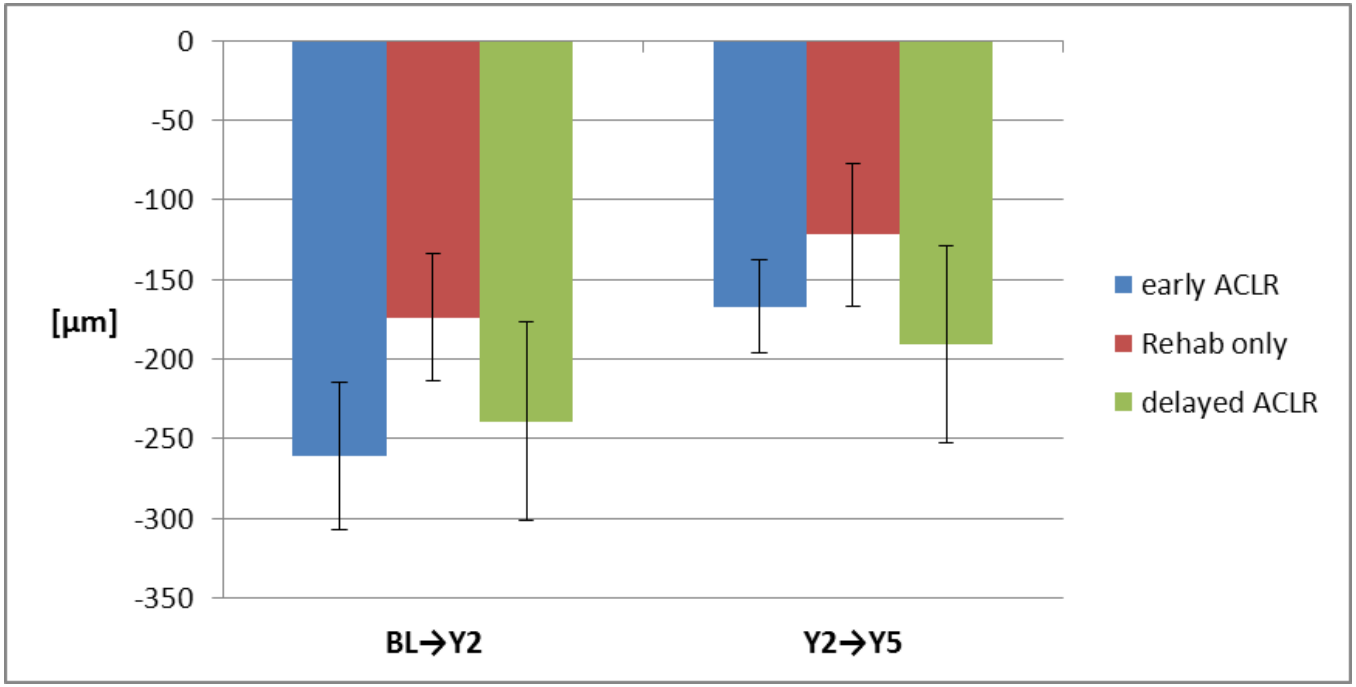
- Increase in cartilage thickness observed in both periods
- No significant differences between treatment grups in the initial and the subsequent observation periods (crude/adjusted p≥0.18 / p ≥ 0.16)



Mean change ± 95% confidence intervals

Ordered value 1

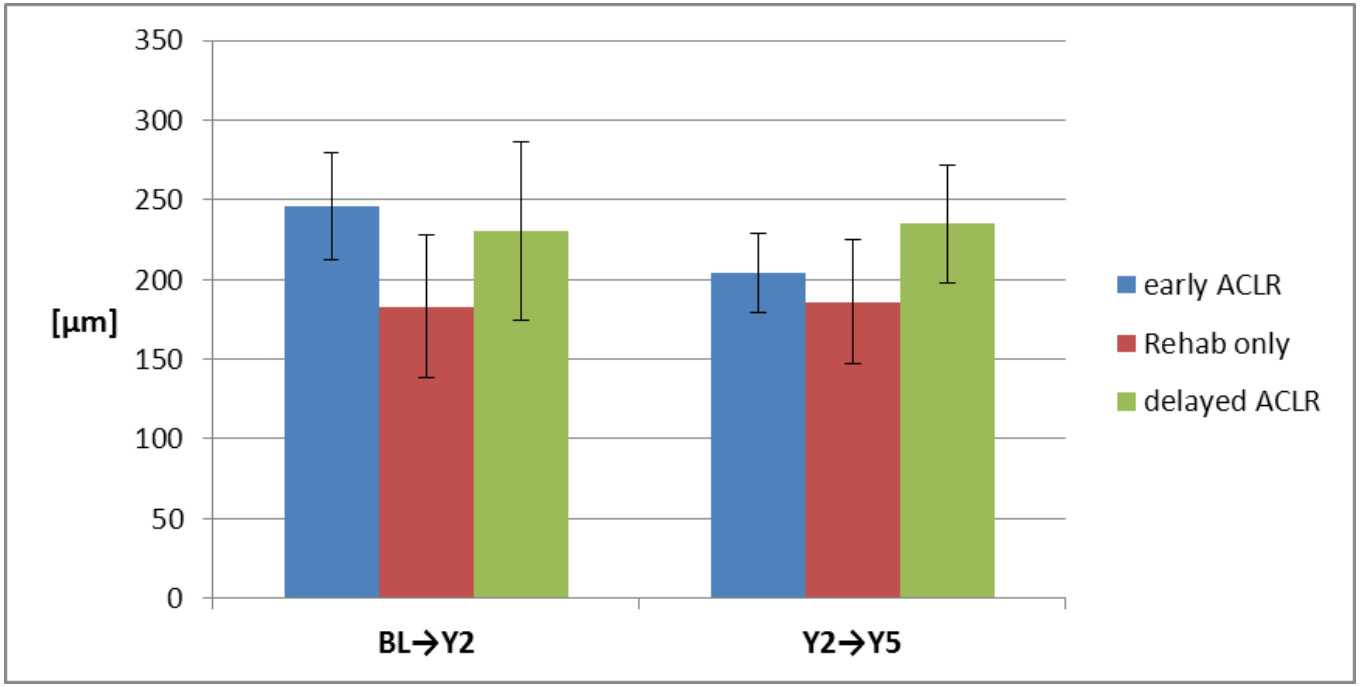
- OV 1 significantly greater for early ACLR than in knees without ACLR between BL and Y2 (crude/adjusted p=0.02/0.02)
- OV 1 tended to be greater in knees with delayed ACLR than in knees without ACLR in both periods (crude/adjusted p>=0.08/0.09)



Mean change ± 95% confidence intervals

Ordered value 16

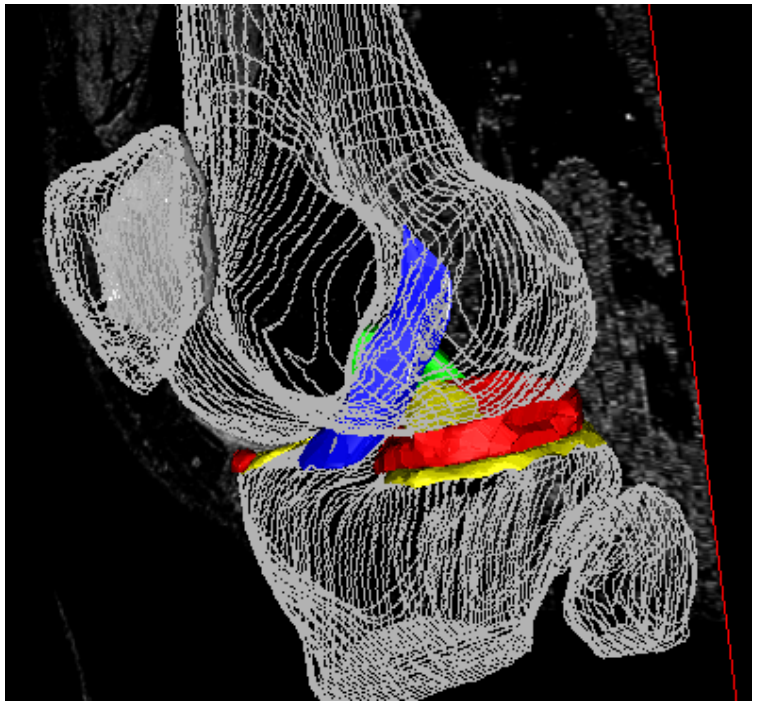
- OV 16 significantly greater for early ACLR than in knees without ACLR between BL and Y2 (crude/adjusted p=0.04/0.03)
- OV 16 tended to be greater in knees with delayed ACLR than in knees without ACLR in both intervals (crude/adjusted p>=0.07/0.04)

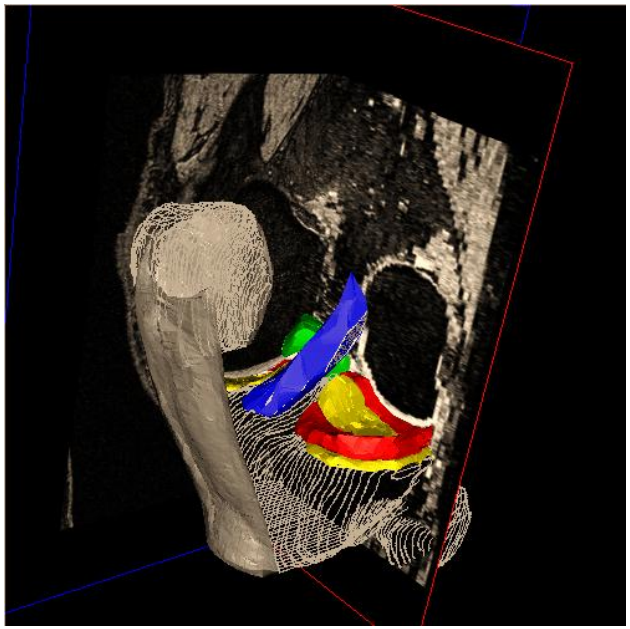


Mean change ± 95% confidence intervals

Conclusions

- Increase in MFTC cartilage thickness observed over both periods
- No significant differences observed for primary outcome between treatment groups
- Greater magnitude of subregional change in knees with early ACLR than in knees without ACLR in initial 2 year period
- Somewhat greater magnitude of subregional change in knees with delayed ACLR than in knees without ACLR in both periods
- ACL reconstruction surgery may induce elevated magnitude of subregional cartilage thickness change in the period following the surgery but not in later periods.





Further KANON abstracts :

- #118
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NanoDiaRA

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