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Comparable Primary Stability Between Current-Generation Adjustable Loop Cortical Buttons for Anterior Cruciate Ligament Reconstruction – A Biomechanical Study

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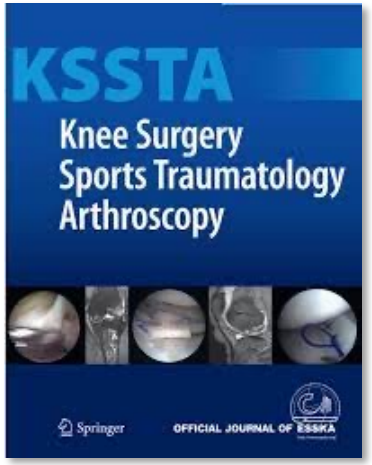
Disclosures

The authors have no conflicts of interest to disclose

Introduction



Adjustable buttons for ACL graft cortical fixation partially fail with cyclic loading and unloading

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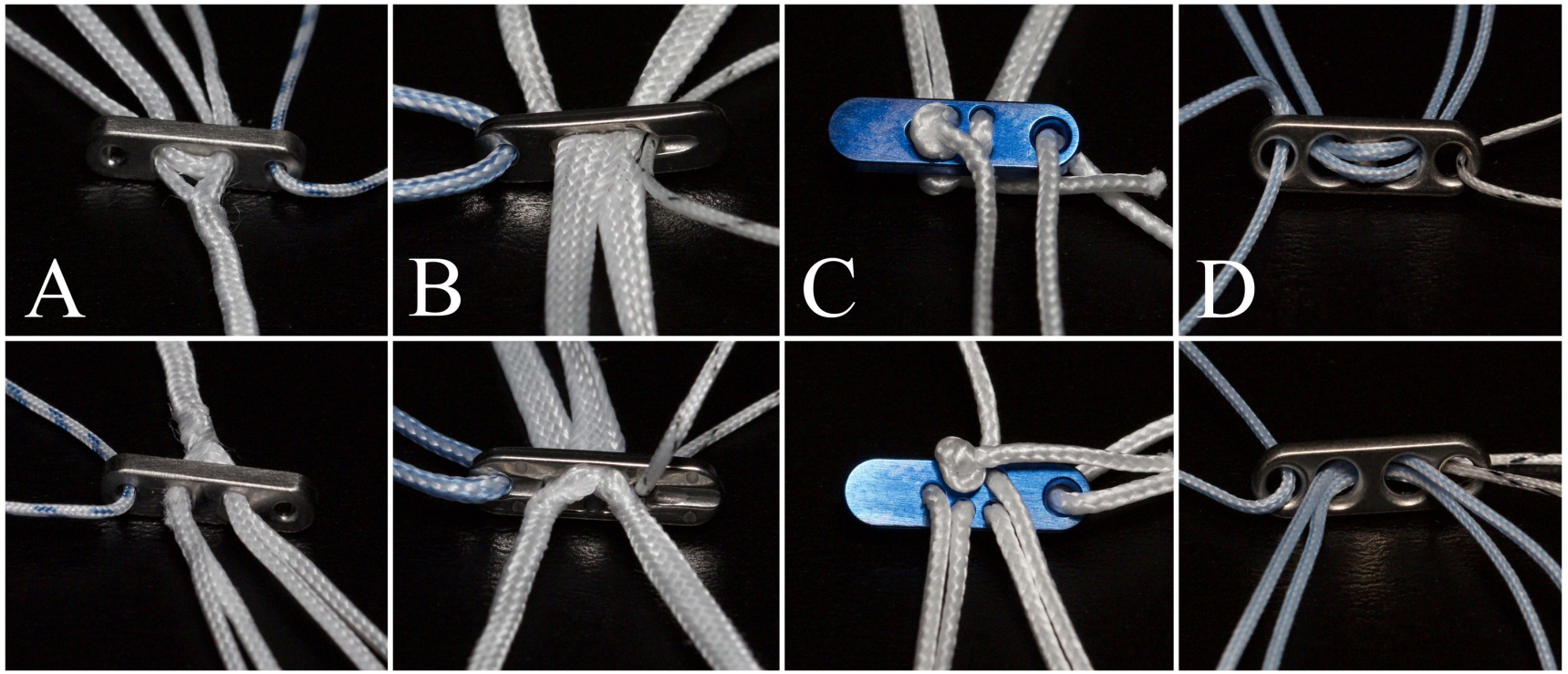
- Previous generations of adjustable loop buttons (ALB) showed increased construct elongation under cyclic loading with complete unloading, which might lead to construct failure of anterior cruciate ligament reconstruction (ACLR).

Purpose → To compare contemporary ALB regarding their primary stability and to compare them to a continuous loop button (CLB) construct.

Methods – Implants used



A = Infinity™ Button (ConMed, Utica, New York) = ALB 1

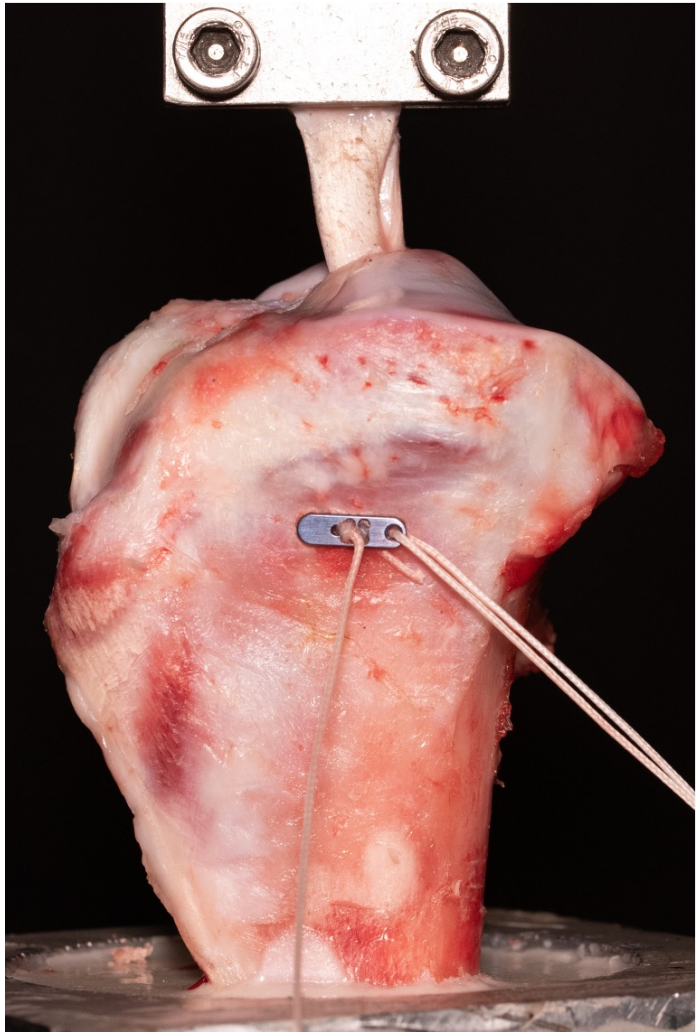
B = Tightrope® II RT (Arthrex, Naples, Florida) = ALB 2

C = A-TACK (Karl Storz, Tuttlingen, Germany) = ALB 3

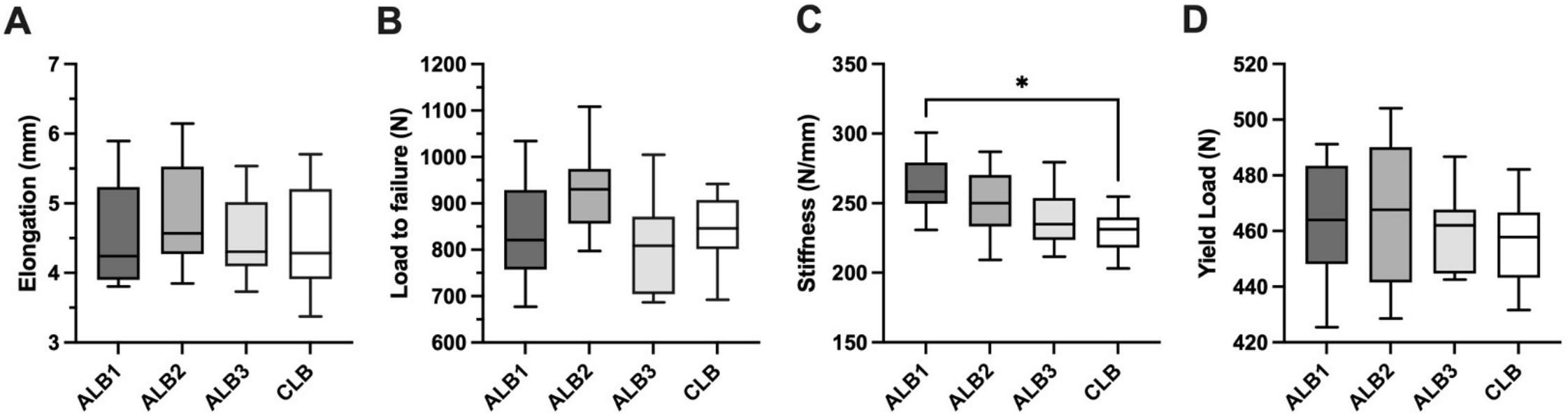
D = FlippTack (Karl Storz, Tuttlingen, Germany) = CLB

Methods – Test Protocol

- Testing performed with uniaxial testing machine (model Z005, Zwick/Roell, Ulm, Germany)
- Test protocol
  - Cyclic loading
    - 1000 cycles from 0 to 250 N
  - Load to failure (25 mm/min)
- Determination of stiffness and yield load from the load to failure curve
- Statistical comparison by Kruskall-Wallis test with posthoc Dunn's correction



Results



No significant differences between button constructs regarding elongation and load to failure, stiffness, and yield load

ALB1 = Infinity™ Button (ConMed, Utica, New York)
ALB2 = Tightrope® II RT (Arthrex, Naples, Florida)
ALB3 = A-TACK (Karl Storz, Tuttlingen, Germany)
CLB = FlippTack (Karl Storz, Tuttlingen, Germany)

Conclusion

Contemporary ALB devices do not show significant differences regarding elongation and load to failure, attributable to implant design, and in comparison to a CLB device. Therefore, all tested implants can be used for ACLR.

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Thank you!

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