Clinical Summary

Pull-Through Strength of Regeneten Tendon Anchor vs. #2 Mattress Stitch in Porcine Rotator Cuff

BioBrace® Publications

Aim:

This study evaluates the pull-through strength of the Regeneten™ Tendon Anchor (Smith & Nephew) versus the conventional #2 Hi-Fi® Mattress Stitch (CONMED) in an ex vivo porcine rotator cuff model under clinically relevant shear loading, providing a biomechanical assessment of their performance in tendon repair.

Methods

Twelve matched pair porcine rotator cuffs were fixed to a uniaxial testing machine. Each specimen was fixed to the grips and the stitch or anchor was pulled to failure at 48mm/min.

- Test Groups: (n = 12 per group)
  - #2 Mattress Stitches
  - Tendon Anchors
  - Outputs: Max Load (N) - Load when the sample failed

Results

- Primary Findings:
  - Mattress stitches were 10x than tendon anchors ($p < 0.001$).
  - Average max load:
    - Mattress Stitch: 101.8 ± 41.5 N
    - Tendon Anchor: 9.6 ± 2.8 N
- Failure Modes:
  - **Mattress Stitch:** Suture pull-through at tendon edge.
  - **Tendon Anchor:**
    - **Pull-out:** The anchor slipped out of the tendon (7.3 N average).
    - **Breakage:** The anchor itself broke under pressure (11.8 N average).
    - Statistically significant difference between these two modes ($p = 0.002$).

Key Takeaways

- **Superior Strength:** Mattress stitches are 10x stronger than Regeneten Tendon Anchors in rotator cuff fixation (101.8 N vs. 9.6 N).
- **Clinical Advantage:** Stronger fixation at surgery time supports better healing and implant stability.

CONMED