Biomechanical Comparison of 4 Achilles Tendon Repairs: In vitro Study in Bovine Achilles Tendons

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**Summary**
Modifying the number of strands in the repair of the Achilles tendon results in the greatest increase of tensile strength and gap resistance compared to Krackow, Dresden and oblique techniques.

**Introduction**
Operative treatment for acute achilles tendon ruptures is generally recommended. Minimally invasive procedures have been designed in order to decrease soft tissue complications. Any repair should be able to withstand early postoperative motion.  
Our objective was to evaluate the strength of a mini open repair with and without modifications in bovine achilles tendons.

**Methods**
Twenty fresh bovine Achilles tendon were incised 4 cm proximal to the calcaneal insertion, then were randomly repaired using either a mini open technique (Dresden technique), modified oblique Dresden technique (Oblique technique), modified triple strand Dresden technique (Triple technique) and Krackow repair (Krackow). All tendons were repaired using a number 2 polyblend suture. Each tendon was loaded to failure. Force at 5 mm gap formation, peak load to failure and the failure mechanism were registered.

**Results**
Gapping resistance was significantly greater for the triple repair (246.1 N to initial gapping) versus the Dresden (180 N, p=0.012) and the Krackow repair (101 N, p< 0.001), Krackow (223.6 N, p

**Conclusion**
The triple strand technique significantly increased the tensile strength and gap resistance of bovine tendon repairs. Improving our tendon repair strength will allow early postoperative rehabilitation and hopefully achieve better functional results.