“Iso-Elastic” Polymer Cerclage Provides Improved Fixation Versus Inelastic Cerclage Devices

The SuperCable® Iso-elastic Polymer Cerclage system has been shown to provide more durable fixation in both cyclic and static load tests versus cerclage devices of other types. No other cerclage system, whether polymer or metal-based, offers the SuperCable’s iso-elastic property, which is key to its improved fixation performance. Each SuperCable cerclage implant consists of two strands made from UHMWPe fibers and a Nylon monofilament core. UHMWPe fibers are intrinsically very inelastic, however, due to the woven configuration of these fibers around the central nylon core, an engineered iso-elastic property is achieved. This elasticity allows the cable to absorb and dissipate loading when bone flexes. Importantly, it provides a unique capability to maintain construct stability even when there is slight bone resorption or settling at the fracture site, with the elasticity of the applied cable maintaining compression.

A study in *Journal of Orthopaedics* showed SuperCable outperformed both Arthrex FiberTape “static cerclage” (and a 2-screw construct) in both cyclic loading and load-to-failure tests.[1] In cyclic loading, SuperCable resisted failure at 100-200 N, while Arthrex FiberTape failed at 5-50 N and the 2-screw construct at 25-50 N. In load-to-failure tests, SuperCable withstood 558.1 N, compared to 422.0 N for the 2-screw construct and 366.8 N for FiberTape. Notably, Arthrex FiberTape showed higher variability, indicated by a much larger standard deviation.

In vitro cyclic testing was also conducted on a sternal closure model comparing SuperCable, braided metal cable, and monofilament wire.[2] A pressure sensor was placed in the osteotomy plane to record “closure force” before, during, and after ten load cycles of 800 Newtons each. The closure force provided by SuperCable was greater than that of both the braided cable and monofilament wire at all time points. Of particular note, residual closure force after cyclic loading was almost completely lost with both the braided cable and the wire due to deformation of the bone analog test material at the site of cerclage contact. This bone deformation is commonly referred to as “cut-though” in sternal closure. SuperCable reduces the risk of this issue because of its elastic property, which allows energy absorption and rebound of the fixation thereby reducing contact stresses on the bone (Fig 1).

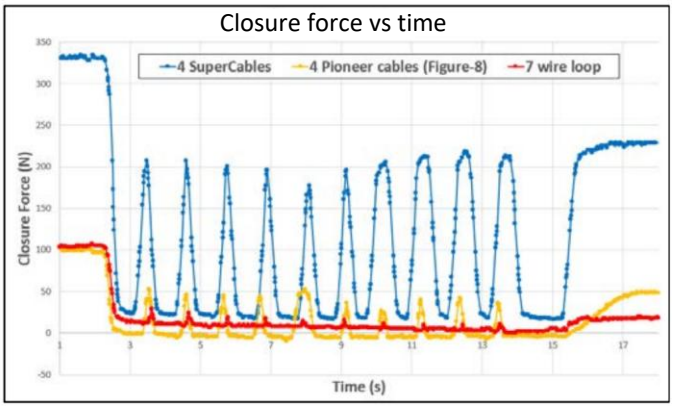

Fig. 1. Fixation force during cyclic loading, showing maintenance of fixation with iso-elastic SuperCable (blue line) versus loosening of metal cables (yellow line) and wire (red line).[2]

1. Paul et al (2025). Non-screw glenoid augmentation constructs for shoulder instability with bone loss: A biomechanical assessment of static and elastic cerclage constructs. Journal of Orthopaedics 66:1-7.
2. Sternotomy Closure Force Under Cyclic Lateral Distraction: Comparison of Three Closure Techniques. Test report on file at Kinamed.

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