Tissue rip-through protection technology
ZipE® Knotless Tissue Repair Devices

Most arthroscopic surgical constructs rely on a direct suture-tendon interface repair method. High mechanical stress concentrations around the suture zone may lead to progressive tissue damage causing early rip-through failure. Present devices are permanent sutures in a closed loop system. It has been reported that rotator cuff repairs can have re-tear rates as high as 57% after 6 months.

ZipE® Knotless Tissue Repair devices function as a protective system against rip-through, by distributing the same surgical construct forces in a much larger tissue interface area (33 mm² for ZipE® vs 0.19 mm² using a single USP class 2 surgical suture). The larger area of ZipE® reduces the stress concentration significantly, and thus protects the tissue against progressive damage. Lower stress concentration not only diminishes the probability of a rip-through failure but also helps the tissue healing process by not restricting blood perfusion around the repair area due to a lower compressive and shear stress concentration. Finally, the lower stress concentration is helpful when repairing weak, damaged or degenerated tissue, which is often friable.

A series of in-vitro mechanical tests were conducted to compare the different surgical constructs using UHMWPE suture for rip-through performance. Overall, ZipE® proves to be a knotless surgical repair technology that protects the tissue against the shearing effect of standalone suture by preventing direct suture-tendon contact while also distributing the force into a larger contact area, thus reducing the stress concentration. The ZipE® device provides for a stronger construct designed to resist rip-through better than common device suture configurations.

Average maximum force before rip-through failure
Higher is better


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