

SCOPE THIS OUT

A Technical Pearls Newsletter for Arthroscopists

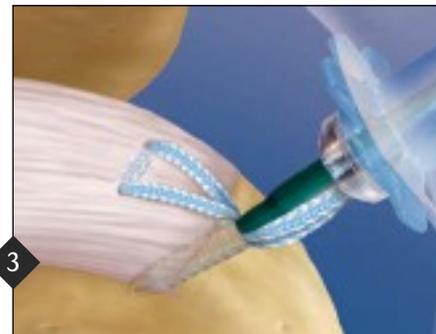
SpeedFix – Knotless Single Row Rotator Cuff Repair

Knotless, single row rotator cuff repair is made simple with the SpeedFix. Threaded Bio-SwiveLock C suture anchors (a) are combined with 2 mm FiberTape (b) to create a quick and secure construct. FiberTape provides broad compression and testing has shown that it resists tissue cut-through more than standard #2 sutures. The high strength Bio-SwiveLock C is available in both 4.75 and 5.5 mm diameters and is cannulated to facilitate the channeling of bone marrow to the repair site.

The SpeedFix takes advantage of the new Expanula Cannula (c) and Double Scorpion Suture Passer. The Expanula has a deployable collar that is used to retract the deltoid and expand the working area in the subacromial space. The Double Scorpion Suture Passer is used to pass an inverted mattress stitch in a single step. The FiberTape tails are retrieved laterally and loaded through the eyelet of a Bio-SwiveLock C suture anchor. The Bio-SwiveLock C eyelet is inserted into a prepared bone socket until the anchor body contacts bone. FiberTape tension can now be seen and optimized. The anchor body is then threaded into its final position. FiberTape tails are cut flush, completing the knotless repair.



2 Retrieve both FiberTape tails, load them through the SwiveLock C eyelet, and prepare bone socket



3 Insert the anchor into bone socket until the anchor body contacts bone. Adjust tension if necessary. Rotate SwiveLock C driver in a clockwise direction to complete insertion. Cut the FiberTape tails, one at a time, with an open-ended FiberWire cutter.



b



1



Load both tails of a FiberTape into the Double Scorpion and pass an inverted mattress stitch

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PRODUCT INFO

Upper Extremity

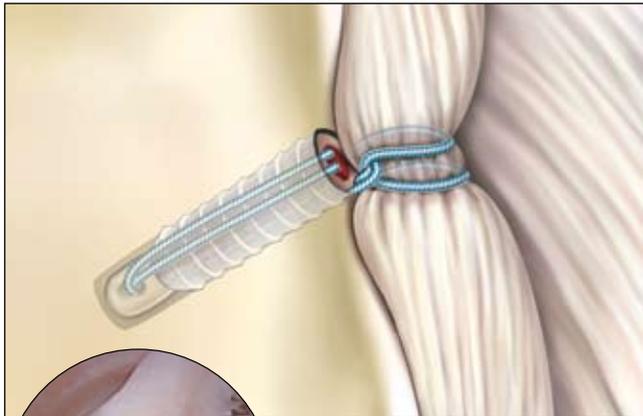


2.9 mm PushLock

The reduced size of the 2.9 mm PushLock has been optimized for glenohumeral joint procedures while maintaining secure knotless fixation.

The PushLock technique provides the surgeon the convenience of passing FiberWire prior to anchor placement, with passing options for multiple suture configurations.

The cannulated design of the PushLock permits bone marrow channeling directly to the repair site to possibly enhance the biological repair.



Knotless Cinch Stitch



Vertical Mattress Stitch w/PushLock
(Courtesy of Neal ElAttrache, M.D.)

Shoulder Repair Set

The Shoulder Repair Set will undergo an improvement/update to allow it to hold a greater number and variety of instruments. This change will affect the design of the insert that holds the suture passing and bone preparation instruments. It will be able to accommodate spears and trocars for all PushLock and SutureTak implants and the punches and taps for all rotator cuff anchors. It will also accommodate any combination of ring handle or WishBone suture passing instruments like the BirdBeak and the Penetrator. Additionally, it will hold any combination of three Scorpion or NeedlePunch instruments.



5.5 mm Bio-Corkscrew FT TriplePlay

This unique implant is the only biodegradable triple-loaded anchor on the market. While using the same anchor body design as our current fully threaded anchors, a material eyelet was added to its distal end for three sutures to easily slide. An anchor with three FiberWire sutures is an essential option for complex tear patterns requiring variable suture configurations.



Distal Biceps Repair with the BicepsButton and Tension Slide Technique

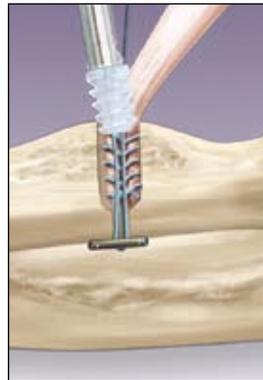
The Tension Slide technique with BicepsButton provides surgeons a simple, reproducible, and biomechanically stable repair of the distal biceps. This “tensioning” technique reliably draws the tendon against the distal cortex of the bone socket and therefore maximizes surface area for tendon-to-bone healing. The addition of a Tenodesis Screw improves the biomechanical strength and allows the tendon to be placed in a more anatomic position. Biomechanical testing has demonstrated excellent load-to-failure characteristics with minimal gap formation, allowing for earlier return to activities of daily living.



Whipstitch tendon using the FiberLoop. Feed the two suture tails through the BicepsButton using the FiberLoop needle.



Pass the button through the radius and draw the tendon to the base of the socket by tensioning the free suture limbs.



To complete the repair, add the Tenodesis Screw to push the tendon to the more ulnar and anatomic position. Tie the free suture ends over the Tenodesis Screw.

PRODUCT INFO

Knee & Hip

Minimally Invasive Hamstring Harvest Technique for All-Inside ACL RetroConstruction

The “mini” hamstring harvest allows simple tendon identification and release with minimized soft tissue trauma and can be accomplished through a small posterior incision.

The mini hamstring harvest is done with no change in position from standard prep for ACLR. The knee is kept flexed and the hip is externally rotated. The tendons are palpated in the area of the posteromedial knee crease and a 2 cm transverse incision is made just medial to the midline. The semitendinosus and gracilis tendons are very superficial at this level and can be easily recognized after simple dissection of overlying fascia. Fascial attachments are easily visualized at this level and can be released, decreasing the chances of premature amputation.

This technique is perfect for autograft harvest for the all-inside ACL technique and is more reproducible and less invasive than standard open techniques.



1 Externally rotate the knee, palpate the hamstring tendons and make a small horizontal incision along the knee crease



2 Identify the tendons and release from the surrounding tissue



3 The short, mini harvest Pigtail Hamstring Tendon Stripper is used to strip the tendon from the proximal musculotendinous attachment



4 The short, mini harvest Semitendinosus Tendon Stripper is used to detach the tendon from the distal tibial insertion

RESEARCH CORNER

BioComposite Interference Screw Ovine ACL Reconstruction Model – 26 Week Data

In an ovine ACL reconstruction model, the BioComposite Interference Screw (70% PLDLA and 30% biphasic calcium phosphate) and the Mitek Milagro Interference Screw (70% PLGA and 30% β -TCP) are currently being analyzed at various time points to evaluate the potential for inflammatory response and osteonecrosis, as well as to investigate absorption rates, soft tissue healing trends and evidence of osteogenesis.

CT data at 26 weeks shows no significant degradation for either screw type. However, initial bone integration (white) at the tibial insertion site is seen with the BioComposite Interference Screws (Figure 1a), while minimal to no bone integration with the Milagro screws (Figure 1b) is observed. Histology slides of the tendon-bone interface at the tibial insertion site shows Sharpey's fibers (black arrows) between tendon and bone using the BioComposite Interference screws (Figure 2a), while there was close direct contact without Sharpey's fibers between the tendon and bone using the Milagro screws (Figure 2b). A normal tendon-to-bone attachment is shown in Figure 2c for comparison. An interesting finding for the BioComposite Interference Screws was the formation of new bone (black arrows) within the tibial screw site (Figure 2d) and within the tendon at the tibial implantation site, while this was not seen with the Mitek Milagro screw. There was no significant inflammatory response seen with either screw.

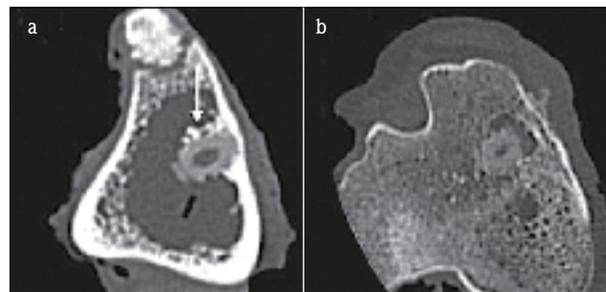


Figure 1

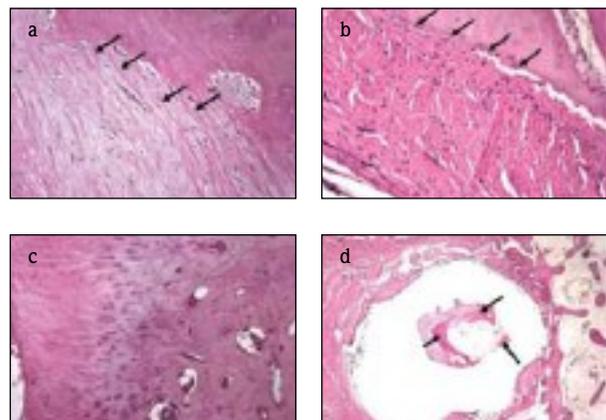


Figure 2

PRODUCT INFO

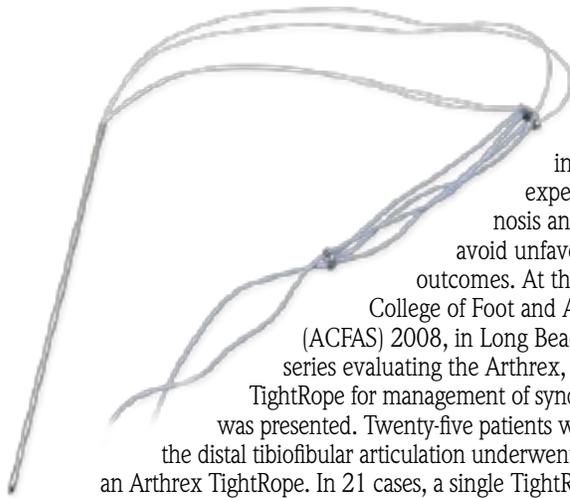
Small Joint



Syndesmosis TightRope Scientific Support

Christopher F. Hyer, D.P.M., Columbus, Ohio
James Cotton, D.P.M., Sarasota, Florida
Gregory C. Berlet, M.D., Columbus, Ohio
Terrence M. Philbin, M.D., Columbus, Ohio

Coming Soon to: *Foot & Ankle International*, August 2008



The complexity of syndesmosis injuries, often with both bone and soft tissue injury, mandates an expeditious diagnosis and treatment to avoid unfavorable long-term outcomes. At the American

College of Foot and Ankle Surgeons (ACFAS) 2008, in Long Beach, California, a series evaluating the Arthrex, Inc. (*Naples, FL*) TightRope for management of syndesmosis injuries was presented. Twenty-five patients with disruption of the distal tibiofibular articulation underwent treatment with an Arthrex TightRope. In 21 cases, a single TightRope was placed and in four cases two TightRopes were placed. Associated ankle fractures were treated using proper AO technique. Patients with diabetes and/or neuroarthropathic changes in the foot or ankle were not included in this study. Postoperative evaluation parameters included radiographic measurements, a modified AOFAS scoring system as well as evaluation of the SF-12.

Average follow-up was 10.78 months. The mean time to full weight-bearing was 5.52 weeks (2-8). The subset of the Maisonneuve fracture group and the isolated soft tissue injuries had a mean time to full weight-bearing of 4.93 weeks (2-8). Postoperative radiographic analysis of the mean distance from the tibial plafond to the placement of the TightRope(s), medial clear space, average postoperative tibiofibular overlap and the mean tibiofibular clear space demonstrated no evidence of redisplacement of the syndesmosis complex at an average of 10.78 months (6-12). The modified AOFAS hindfoot scoring scale and SF-12 both demonstrated significant improvements.

Using the TightRope for syndesmosis reconstruction allows for an expeditious surgical technique, and is minimally invasive with reproducible results. Our series demonstrated no hardware complications eliminating the need for a second surgery to remove hardware. Our patients were able to engage in early full weight-bearing and ultimately returned to activities of daily living, sports and work.

Reference:

1. Hyer, C.F., Cotton J., Berlet G.C., Philbin, T.M. *Treatment of Syndesmosis Injuries using the Arthrex TightRope: A Report of 25 Cases.* ACFAS Annual Scientific Conference, Long Beach, California, February 24, 2008, (3rd place manuscript).

Mini TightRope Simplifies Thumb CMC Procedures



Whether used for instability or arthroplasty, the Mini TightRope is enabling surgeons to perform common CMC procedures without harvesting tendons. Surgeons in Germany were the first to try the device for arthroplasty almost a year and a half ago, and several surgeon groups in the United States have embraced the technique for reconstruction in instances of instability and arthroplasty. To date, there have been over 40 cases done worldwide with very good results.

Advantages that have been described by surgeons include reduced morbidity, shortened surgical time, and earlier rehabilitation with excellent postoperative grip and pinch strength scores.

In the past, these procedures would have required that a tendon sling using FCR, ECRL, EPB or APL be created to stabilize the thumb metacarpal. While results for these procedures are mostly good or excellent, the morbidity associated with using these other structures has been accepted as a necessary evil.

With the Mini TightRope, the greater good can now be accomplished without sacrificing functional anatomy.



Pre-op

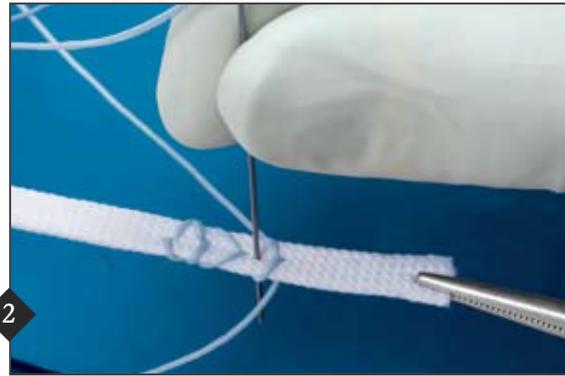


Post-op

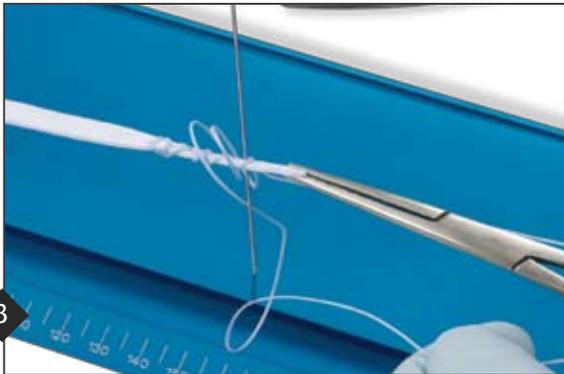
IN THE Loop

Increase Graft Strength with Super SpeedWhip

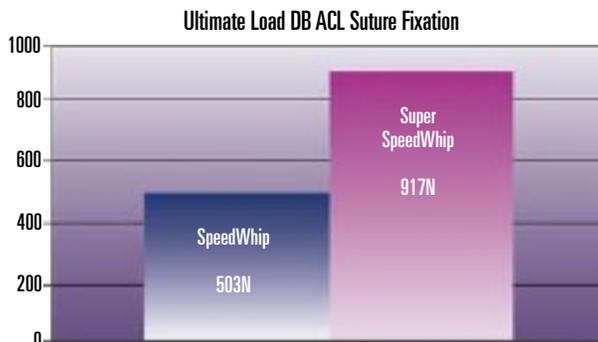
SpeedWhip has already been shown to have increased strength and stiffness over standard whipstitching techniques.* The new Super SpeedWhip technique increases strength by over 80%.



Simply stitch the graft according to the standard SpeedWhip technique and lock every 2-3 stitches by passing the needle proximal to the last stitch.



Place a “collar stitch” in the end of the graft by cutting the end of the suture loop, wrapping one tail of the suture around the end of the graft 2-3 times, and passing this tail back through the graft above the last stitch using the FiberLoop needle.



This technique is ideal for reinforcement of soft tissue grafts and can increase pull-out strength of primary and secondary fixation methods.

*Botero et al. *Comparison of the Krackow Locking Stitch to the Novel Continuous Loop Suture Technique for Fixation of Free Tendon Ends*. Presented SOMOS 2007.

Pointers and Pearls

Mini TightRope FT Fixation

The Mini TightRope FT was developed to offer surgeons a new technique for the correction of the intermetatarsal angle (IMA) for hallux valgus. As is with the standard Mini TightRope placed distally, the Mini TightRope FT can support correction of the IMA if used proximally along the 1st metatarsal. The Mini TightRope FT uses a 4.5 mm (fully threaded) Bio-Corkscrew FT, #2 FiberWire and a cupped stainless steel button. This construct can be used with a distal osteotomy, acting as a backstop to help prevent recurrence of the deformity (inset).



1 Release the lateral soft tissue structures and reduce the bunion deformity.



2 Insert a K-wire, starting on the medial cortex of the 1st metatarsal, at least 1.5 to 2.5 cm distal to aim for the base of the 2nd metatarsal.



3 Pass the step drill over the K-wire until the pin tip of the drill penetrates the medial cortex of the 2nd metatarsal. Confirm proper alignment with fluoroscopy. Remove the drill bit and the K-wire.
Note: Do not penetrate the medial cortex of the 2nd metatarsal farther than 3 mm (length of the step drill).



4 Pass the cutting punch/tap through the 1st metatarsal and the 2nd metatarsal, making sure you do not advance the instrument beyond the lateral wall of the 2nd metatarsal base. Confirm on fluoroscopy.



5 Advance the Mini TightRope FT on the driver through the 1st metatarsal and thread the anchor into the 2nd metatarsal. Confirm on fluoroscopy.
Note: You can visualize the anchor only by observing the metal tip. The bioabsorbable anchor is 6 mm past the metal driver tip.



6 Tighten the trailing medial button over the 1st metatarsal. Use at least three half-hitches to tie off suture and lock button in place medially. Cut the suture ends long enough to allow the knot and suture to lie down, reducing knot prominence.



Distal Chevron



What's in My Bag?



Featuring: Neal ElAttrache, M.D.

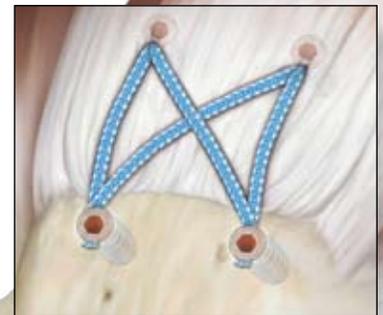
*Director of Sports Medicine Fellowship,
Kerlan-Jobe Orthopaedic Clinic, Los Angeles, California*

Q. Your landmark article on the first generation SutureBridge construct suggested that the interconnected sutures provided greater resistance to cyclic loading and a broad compression of the tendon footprint. What other testing have you done or has been published?

A. Our initial studies developing the SutureBridge concept of rotator cuff repair focused primarily on the significant enhancement of footprint coverage and compression, as well as the biomechanical endurance and strength under cyclic and ultimate linear loads. Since then, we have published studies showing superior performance of the SutureBridge compared to single row and standard double row constructs when exposed to rotational loads, loads during abduction/adduction and repairs under tension. The summary of this body of work is that the “suturebridging” construct provides the most secure tendon-to-bone repair over the largest area of the bony footprint, maximizing cuff healing potential. We have found the integrity of this construct to be superior to other constructs under simulated *in vivo* forces.

Q. What developments have occurred with this construct since its original inception?

A. Over the past four years we have worked with Arthrex to develop and modify anchors and suture material to facilitate even greater efficiency in performing bridging repair constructs. These products include the larger diameter 4.5 mm PushLock, the self-punching metal-tipped PushLock and FiberTape suture material. The PushLock anchors are very easy to use and quick to deploy. Fine-tuning of the repair tension can be trialed and readjusted by tensing or relaxing the bridging sutures placed through the PushLock eyelet up to final deployment of the anchor. The self-punching PushLock allows one-step placement of the lateral fixation. The introduction of FiberTape offers exciting advantages. Biomechanical testing has shown that small and moderate size tears can be securely fixed to the footprint with a knotless SutureBridge construct called the “SpeedBridge.” This uses the broader FiberTape material instead of FiberWire in the medial anchors, passing both limbs of the FiberTape from each anchor in the usual mattress cross-bridging fashion but without tying medial knots. The FiberTape sutures are passed through the eyelet of a newer device called the closed-eyelet SwiveLock or SwiveLock C which fixes the FiberTape into the lateral wall of the tuberosity similar to the PushLock. Recently, we have been using the 4.75 SwiveLock C for the medial row of anchors, as well as the lateral row. For larger tears, we load the medial anchors with both a FiberWire and a FiberTape. The FiberWire and FiberTape limbs are passed in mattress fashion tying and cutting the FiberWire, while leaving the FiberTape untied to cross-bridge over the tendon and fix into the lateral wall with another pair of SwiveLock C anchors. We feel that larger tears benefit from medial knots to seal the healing zone from the synovial environment and decrease strain transmitted across the footprint to the lateral fixation. Another attractive advantage of using the SwiveLock C anchors medially is the cannulated design of the anchor. Recent studies from HSS have shown increased endosteal blood flow at anchor sites in the greater tuberosity after cuff repair. The cannulation of the anchor provides an open channel through the anchor for passage of marrow elements which can bathe the bone-tendon interface of the repaired footprint.



continued

Q. How long have you been using this construct and what correlations have you found between the data from your paper and your patient outcomes?

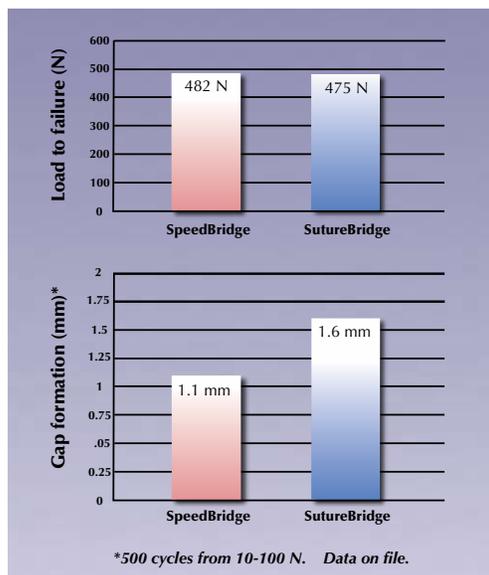
A. We have now been incorporating the SutureBridge construct and its variations as mentioned above for rotator cuff repair for approximately four years. This has become one of the most satisfying operations in my practice. This construct has allowed us to permit earlier passive and active range of motion especially in rotation. This is consistent with reports we have been receiving from Europe and Asia, where they have been more aggressive in moving their patients post-op. Importantly, we have documented and reported excellent outcomes with MRI confirmed intact repairs approaching 90% at one year in a study which included large and massive tears.

Q. What future developments in rotator cuff repair techniques do you believe will further contribute toward improved patient outcomes?

A. In the future, we hope to further enhance the rate of healing with manipulation and optimization of biologic factors. This includes biologically active anchors, suture material, and collagen templates. We also look forward to the commercial release by Arthrex of an autologous concentrated blood product recovery and delivery system, currently in the final stages of development and approval. This system of biologic enhancement combined with the proven biomechanically successful repair constructs will provide the consistent high rates of clinical success that we hope to provide for our patients.

...the Science Behind the Technology

Matched-pair cadaveric testing shows that the SpeedBridge is substantially equivalent to the SutureBridge in both strength and gap formation.



STO Featured Product Information

SwiveLock C, 4.75 mm x 15 mm	AR-2324BSLC
SwiveLock C, 5.5 mm x 15 mm	AR-2323BSLC
Double Scorpion Suture Passer.....	AR-13994
Double Scorpion Needle.....	AR-13994N
Expanula Cannula, 8.25 mm I.D. x 7.5 mm.....	AR-6569
FiberTape	AR-7237-7
PEEK 2.9 mm PushLock.....	AR-1923PS
Master Shoulder Repair Set.....	AR-8402MS
Bio-Corkscrew FT, w/three #2 FiberWire	AR-1927BF-3
BicepsButton.....	AR-2261
Pigtail Hamstring Tendon Stripper, short.....	AR-1278P
Semitendinosus Stripper, short.....	AR-1278
BioComposite Interference Screw, 7 mm	AR-1370C
BioComposite Interference Screw, 8 mm	AR-1380C
BioComposite Interference Screw, 9 mm	AR-1390C
BioComposite Interference Screw, 10 mm	AR-1400C
TightRope Syndesmosis Repair Kit, titanium.....	AR-8920CDS
TightRope Syndesmosis Repair Kit, stainless steel.....	AR-8921CDS
Mini TightRope Repair Kit.....	AR-8911DS
#2 FiberLoop w/Straight Needle.....	AR-7234
#2 FiberLoop w/Straight Needle, w/TigerWire.....	AR-7234T
Mini TightRope FT Repair Kit.....	AR-8912DS
Bio-Corkscrew FT, 5.5 mm x 15 mm.....	AR-1927BF
Bio-PushLock, 3.5 mm x 14 mm	AR-1926B

For more information or to order, contact your Arthrex representative or call Customer Service at 800-934-4404.



Scope This Out is an informational newsletter designed to educate orthopaedic surgeons on state-of-the-art surgical procedures and “pearls” to assist in improving surgical skills. This newsletter is published quarterly by Arthrex, Inc., exclusively for the orthopaedic surgeon community.

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