2014 has been another significant year for the Distal Extremity division at Arthrex and we are excited to create the first ever Hand & Wrist Ortho Update issue. Although hand & wrist has been part of Distal Extremities for many years, we are pleased to announce a dedicated team of product managers focused solely on hand & wrist solutions. With this focus and expansion our hand & wrist portfolio is growing rapidly and will continue to grow for many years to come. Some of the new hand & wrist solutions coming from Arthrex this year include the new Wrist Plating System, Headless Compression Screws and unique product solutions for CMC suspensionplasty and scapholunate pathologies, among others.

Our hand & wrist medical education continues to expand and train more surgeons than ever before. This year alone we have hosted multiple dedicated hand & wrist courses with training facilities in: Naples, FL; Vail, CO; Manhattan, NY; Scottsdale, AZ; Kerlan-Jobe Orthopaedic Clinic (Los Angeles, CA) and University of California Irvine (Irvine, CA). We hosted our largest ever hand & wrist training event here in Naples, FL this past May.

We look forward to continuing our innovation and growth into this exciting market and hope you will follow us, as they are just a few of the exciting highlights happening at Arthrex. Stay tuned for more updates, as they become available, or visit us on our website at www.arthrex.com.

RJ Choinski
Senior Product Manager
Arthrex Inc.
Ronald.Choinski@Arthrex.com

Distal Radius

Arthrex is pleased to announce that we are expanding our Hand & Wrist portfolio to include a new Wrist Plating System. With a dedicated Distal Extremities sales force, Arthrex is tackling this market with a comprehensive distal radius and fracture-specific set. The initial release in Spring 2014 included volar distal radius plates followed by fracture-specific plating later this year.

The plate is made from titanium and incorporates comprehensive features that will simplify fracture reduction and fixation of these common cases. In addition to a comprehensive plate selection, multiple screw options are available including fixed angle locking, variable angle locking and nonlocking options. With variable angle locking in a 20 degree cone, fixation and fragment targeting options are maximized.

The modular instrumentation inserts are easy to identify. The screws sit in a graduated tray to ensure the proper length is given to the surgeon, reducing the time needed to measure screws by hand.
**SCIENTIFIC ARTICLE SUMMARIES**

**Anchors**

- “The Corkscrew Suture Anchor showed a significantly superior performance in load-to-failure, load at first significant displacement, and gap formation at the tendon-bone interface.” — Halat et al
- “Minor gap formation in the Corkscrew group suggest that this might be a better implant for patients undergoing an immediate passive mobilization protocol.” — Halat et al
- “In view of our observation, the principal reason for the higher strength of the Corkscrew was the FiberWire suture compared with the Orthocord suture.” — Halat et al

**CONCLUSION:** The Micro Corkscrew FT Suture Anchor loaded with 2-0 FiberWire improves outcomes for patients undergoing a flexor digitorum profundus reattachment.


**CMC TightRope®**

- The Mini TightRope suspensionplasty achieves similar stability as K-wire fixation (as shown in the literature), but allows mobilization of the thumb as early as ten days postoperatively.
- This unique ability to allow early movement may lead to faster rehabilitation, a shorter recovery period, and increased patient satisfaction.
- The high level of satisfaction shown using QuickDASH scores, excellent range-of-motion, and strength achieved at a minimum 2-year follow-up support the benefits of Mini TightRope suspensionplasty in the treatment of thumb carpometacarpal joint arthritis.

**CONCLUSION:** CMC suspensionplasty with the Mini TightRope has now been clinically proven to offer substantial benefits over current techniques. The two year follow-up builds on previous publications which have shown the biomechanical stability of the construct compared to K-wire fixation and outlined the technique in clinical practice.

ANCHOR SPOTLIGHT

Pull-out Strength in 30 lb/ft³ (lbf) Ultimate Load*

- **Arthrex**
  - 2.2 x 4 mm Micro Corkscrew FT
  - 2.7 x 7 mm Mini Corkscrew FT
  - 2.5 x 10 mm Corkscrew FT
  - 2.5 x 12 mm Corkscrew
  - 5 x 15 mm Corkscrew
  - 2.4 x 7.5 mm FASTak
- **Competitor**
  - 2.9 mm PushLock
  - 2.5 x 8 mm Bio-PushLock
  - 3 x 14 mm Small Joint SutureTak
  - 2.4 x 8.5 mm Mini SutureTak
  - 2.4 x 6.5 mm Micro SutureTak
  - 2.5 x 8 mm PEEK PushLock

*data on file

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<th>Anchor Type</th>
<th>Arthrex Ultimate Load</th>
<th>Competitor Ultimate Load</th>
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<td>5 x 15 mm Corkscrew</td>
<td>18.4 lbf</td>
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<tr>
<td>2.4 x 7.5 mm FASTak</td>
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*Pull-out Strength in 30 lb/ft³ (lbf) Ultimate Load*
Q. How long have you been using the Mini TightRope for CMC arthritis?
A. 6 years

Q. What are the overall benefits of using the TightRope versus a more traditional ligament reconstruction tendon interposition (LRTI) or hematoma distraction arthroplasty?
A. By using the TightRope, I don’t have to wait for soft tissue reconstruction to heal (LRTI, APL suspensionplasty) and I also don’t have to leave any external K-wires to maintain the trapeziectomy space (hematoma distraction arthroplasty). Therefore, I can initiate a rehabilitation protocol as early as 5–7 days after surgery with this implanted device, maintaining my trapeziectomy space.

Q. What type of patient is the TightRope indicated for?
A. Any patient with thumb carpometacarpal joint arthritis that fails nonsurgical treatment measures (such as splints, injections, activity modifications and therapy).

Q. How has this changed your post-op protocol?
A. This device has been a game changer for me because instead of immobilizing my patients for 4 weeks (with or without an external K-wire), I am able to accelerate the post-op protocol by starting it 5–7 days following surgery. I don’t start therapy immediately because I do believe a week is appropriate to allow the skin and other soft tissues to heal, but I suppose immediate therapy would be ok as well with this technique.

Q. How many patients have you performed this procedure on?
A. Over 50

Q. How have your patients responded to the CMC Mini TightRope in contrast to previous technique options?
A. The overall recovery is much faster with this technique. Typical full recovery is around 3 months as compared to 3–6 months or more for my previously-preferred techniques (arthroscopic hemitrapeziectomy and pinning for 4 weeks or APL suspensionplasty). It has been most telling in my patients who had one of those previous procedures on one thumb and then had the TightRope suspensionplasty on the second thumb and they have been universally happier with the TightRope procedure because of the decreased recovery time.
Q. What made you decide to use headless screws over a four-corner fusion plate for a four-corner fusion?
A. I used different four-corner fusion plates for several years and was never completely satisfied with the results, especially with the nonunions. I also did not like the large amount of dorsal reaming required to make the concave recess necessary for placement of the plate. With the excellent compression provided by Headless Compression Screws, their ease of placement and their completely buried locations within the carpal bones, I quickly made the transition to using them for intercarpal fusions, including four-corner fusions. I have been very pleased with the results. Nonunions have become very rare in my experience with these screws and even when they do occur, they are oftentimes not painful due to the rigid fixation provided by the screws.

Q. What is your preferred placement for these screws?
A. For four-corner fusions, my preferred placement is as follows: one retrograde 3.5 mm screw across the capitolunate joint (with a starting point at the dorsal base of the third metacarpal), one ulnar-volar to radial-dorsal 3.5 screw across the lunotriquetral joint and one ulnar-dorsal to radial-volar 3.5 mm screw across the triquetrum-hamate-capitate joints. An alternative construct is using four screws, one for each of the intercarpal joints, but I’ve found that three screws do just as well.

Q. Are there any advantages with the new Compression FT Screws over screws that you were previously using?
A. The Compression FT Screws provide excellent compression and fixation, similar to other Headless Compression Screws that I was using before. One advantage I saw immediately when using the screw for the first time was that the guidewire did not become stuck and routinely came out with the cannulated drill bit after drilling. This saves time and money. I did not have to fiddle with trying to find the drill hole with a new guidewire and I did not have to ask for a new drill bit for the next screw. Another advantage is the star-drive design of the screw head, which allows for increased torque with the screwdriver and less risk of stripping. The straight outer diameter, or nonconical shape of the screw, is another advantage. If you end up undersizing or oversizing the length of the screw, you can insert the same diameter screw with a different length and still get excellent compression and fixation. The straight diameter drill bit means that you’re not obligated to leave the screw in or go to a larger diameter screw.

Q. How have your results been after your first few cases?
A. My results after my first few cases using the Compression FT Screws for four-corner fusions have been great. No nonunions, no loose screws, and very satisfied patients!

Q. What are some other indications for which you would use Headless Compression Screws?
A. I use Headless Compression Screws for a number of other indications in the hand and wrist, including scaphoid fractures, radial styloid fractures, large ulnar styloid fractures (with DRLJ instability), other intercarpal fusions, and thumb and finger fusions. Specifically with the Compression FT Screws, I’ve used them across the scapholunate (SL) joint for chronic SL ligament tears (without arthrosis) and lunate dislocations (one across the SL joint and one across the LT joint).
WHAT’S IN MY BAG?
3.5 mm SwiveLock

Steven J. Lee, MD
Lenox Hill Hospital
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Q. What made you start using the SwiveLock anchor for scapholunate dissociations?
A. Currently, treatments of scapholunate dissociations are suboptimal and often unsatisfactory. Direct repairs are rarely successful and typically fall apart so we rely on a secondary procedure like a capsulodesis to help control DISI deformity. Therefore, a reconstruction makes more sense. However, current reconstructions are either too complex to perform or have weak fixation strength. SwiveLocks are easy to use and have unbelievably strong fixation strength allowing the tendon to heal into the bone as opposed to the surface of the bone.

Q. Can you describe your operating technique when using these SwiveLocks?
A. The operative technique entails using a tendon graft to reconstruct the dorsal portion of the scapholunate interosseous ligament as well as to control the relationship of the lunate to the distal pole of the scaphoid. After restoring the DISI deformity to normal alignment using K-wires, the tendon graft along with a 2-0 FiberLoop is dunked into the proximal pole of the scaphoid with a modified 3.5 mm PEEK SwiveLock. Both the tendon graft and the FiberLoop are dunked into the lunate and secured with another 3.5 mm SwiveLock. Then the graft and FiberLoop is dunked into the distal pole of the scaphoid with a third SwiveLock. The tendon graft is reinforced with the double-stranded 2-0 FiberLoop as an internal brace to provide extra fixation strength during the time that the tendon graft is healing into the bone. I have been leaving the K-wires in for added provisional fixation, and taking them out at about six weeks.

Q. What are a few of the significant advantages over current techniques you have tried?
A. The advantages of this technique are that it does not rely on the healing of the native ligament which in my mind usually does not heal after a direct repair (sort of like an ACL). Therefore, it can be used acutely or chronically as long as significant arthritis hasn’t set in and the carpal bones are still reducible. Also, this repair is super strong—much stronger than anything I am currently using, and this reconstruction addresses not only SUL, but also the flexion of the scaphoid and the extension of the lunate. Finally, it’s relatively easy and fast to do. Typically this surgery takes about 30-45 minutes to perform.

Q. What is your post-op protocol?
A. I put the patient into a plaster thumb spica splint immediately post-op, then change them over to an orthoplasty type thumb spica splint, which stays on until about six weeks post-op. I take out the K-wires and start on a hand therapy program that typically goes for about six weeks.
CMC Mini TightRope

Drilling with the C-Ring Guide – To avoid skiving while holding the C-Ring guide in place, first insert the K-wire in the approximate trajectory wanted in the base of the thumb. The guide can then be assembled on and around the K-wire. Advance the K-wire with the help of the C-Ring Guide to achieve the correct trajectory.

Drilling Freehand – It is often easier to drill from the second metacarpal to the base of the first metacarpal. By drilling in this direction, the knot stack will be on the base of the thumb. The best way to avoid soft tissue irritation is to bury the knots under the APL.

Placing the Mini TightRope – To make sure that the thumb is maintained in an anatomic position, place the Mini TightRope before performing the trapeziectomy. Throw two to three provisional knots on the Mini TightRope, perform your trapeziectomy, and verify the tension of the construct. Proceed with tying down the last few knots or loosen and adjust the tension.

A good rule of thumb for tensioning is to place Kelly forceps under the second button and tie over it. This will prevent overtightening the construct.

SLAM

Drill Separately – The two holes in the lunate and the scaphoid can be drilled independently as well as with the SLAM guide. Place one K-wire perpendicularly into the dorsal side of the lunate and another into the scaphoid. Using these two K-wires as joysticks, open up the scapholunate joint and visualize the articular surface of the lunate. Using the stepped drill, drill into the center of the lunate until you feel the second cortex and stop.

Insert the graft anchor loaded with the Palmaris longus graft and optional LabralTape into the lunate hole. The LabralTape provides extra strength and prevents any elongation of the graft. Tap the graft anchor into the undersized hole until seated firmly.

Visualize the articular surface of the scaphoid. Aiming for the center axis of the scaphoid, drill completely through both cortices until the larger stepped part of the drill exits radially.

Using a tendon passer or a Nitinol wire, pass the Palmaris suture tails exiting the lunate through the scaphoid from the ulnar pole to the radial pole. Secure with a 4 mm Tenodesis Screw and continue the procedure as outlined in the surgical technique.
Distal Radius

The Wrist Plating System provides a comprehensive solution for distal radius fracture management. A wide array of plates are available in narrow, standard, and wide, as well as multiple shaft lengths. A variety of screw fixation options, aiming guides and instrumentation allows for customization according to the surgeon’s needs, and the complexity of the fracture—developed to provide the answer to all your distal radius fixation needs.

Advantages:

Anatomic – Plates are developed to fit the anatomy and contours of the distal radius for a low profile repair and anatomic reduction of the fracture.

Comprehensive – In addition to a comprehensive plate selection, multiple screw options are available including fixed angle locking, variable angle locking and nonlocking options.

Options – Fracture patterns pose unique challenges and the variety of fixation options included allow multiple solutions for even the more complex fracture patterns.

Straightforward Instrumentation – The instrumentation for the 2.4 and 3.5 mm screws are easy to identify in specific modules. The screws sit in a graduated tray to ensure the proper length is given to the surgeon, reducing the time needed to measure screws by hand.

Distal Extremities 2.9 mm PushLock

The 2.9 mm PushLock knotless soft tissue repair anchor was designed to be used with 2.0, 0, #1, or #2 suture. Its revolutionary two-piece design facilitates controlled suture-tensioning intraoperatively prior to committing the anchor in bone, allowing for precise tissue reduction.

NEW PRODUCTS

Wrist Plating System Instrument Set — AR-8916S
The Scapholunate Axis Method (SLAM) reconstruction is performed with the Graft Anchor Implant Delivery System, AR-8826DS. It is indicated for dynamic and static scapholunate instability where there is inadequate ligament to repair, the carpal cartilage is preserved (no arthrosis) and the carpus is reducible. The two-tailed tendon graft is fixed in the lunate bone and scaphoid bone to minimize the creep ("bungee-cord effect") of the graft. The remaining tendon graft is fixed to the dorsal aspect of the carpus, thus reconstructing the scapholunate ligament from inside and outside the carpus. This reconstruction not only addresses the dorsal scapholunate ligament, but also restores the scapholunate articulation along its axis. In a recent biomechanical analysis of SLAM compared to the Blatt capsulodesis and the three-ligament tenodesis procedure, the SLAM had the best biomechanical characteristics with regard to maintenance of scapholunate gap and angle.

Compresssion FT

The headless, titanium 2.5 Micro, 3.5 Mini and 4.0 Standard Compression FT Screws can be used for a wide range of indications in the upper and lower extremities. They are intended for intra-articular and extra-articular fractures and nonunions of small bones and small bone fragments, arthrodesis and osteotomies. The variable stepped thread pitch headless design reduces the risk of profile complications, provides compression and allows for simplified insertion. With these screws, surgeons can now achieve zero-profile stable fixation.

Features and Benefits:
- **Variable Stepped Thread Pitch** – The screw tip’s wider thread pitch enters the bone faster than trailing threads, gradually compressing the fragments as the screw is advanced.
- **Headless** – The titanium screws can be implanted intra-articularly and extra-articularly with minimal risk of impingement or soft tissue irritation.
- **Self-drilling and Self-tapping** – Two sets of cutting flutes facilitate insertion.
- **Multiple Size Options** – The screws are available in 2.5, 3.5 and 4.0.
- **Cannulation** – Assists in accurate placement for both percutaneous and open indications.
- **Improved Driver Engagement** – Hexalobe recess in 3.5 and 4.0 Compression FT Screws provide improved torque transmission. Note: 2.5 screw has 1.5 mm hex driver.
- **Available in titanium alloy.**
DISTAL EXTREMITIES EDUCATION

Remainder of 2014 Course Schedule

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Product Development Team

- Pete Denove: Director of Project Management
- Karen Gallen: Director of Engineering
- Carolyn Brunner: Senior Administrative Assistant
- RJ Choinski: Senior Product Manager
- Abigail Freigang: Associate Product Manager
- Chris Powell: Senior Product Manager
- Lindsey Hall: Product Manager
- Michael Karnes: Product Manager
- Zack Day: Product Manager
- Todd Earhart: Product Manager
- Michelle Morar: Senior Project Engineer
- Scott Peterson: Senior Engineer
- Jerome Gulvas: Senior Designer
- Stephanie Bare: Project Engineer
- Adam Garlock: Associate Engineer
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