Ergonomic handpiece with a simplified, single-handed implant deployment wheel

FiberStitch™ Implant

The FiberStitch implant is an innovative all-inside meniscal repair system that replaces hard PEEK implants with soft suture sheaths. Double-stranded 2-0 coreless FiberWire® suture increases contact area and the pretied knot within the implant eliminates the need to push and tension a knot on the meniscal surface. The ergonomic handle is designed for single-handed implant delivery and the active implant deployment technology minimizes needle exposure beyond the meniscus, eliminating the need to past-point the needle.

Tensionable Knotless SwiveLock® Anchors

The next generation of tensionable knotless technology is now available with the 4.75 mm and 5.5 mm SwiveLock anchors. In the new versions, the tip-retention suture in the SwiveLock anchor eyelets has been replaced with the same tensionable knotless mechanism from our Knotless SutureTak®, Knotless Corkscrew®, and Knotless FiberTak® anchors. Combining our next-generation knotless technology with the trusted SwiveLock anchor design provides a wide variety of applications in rotator cuff surgery for low-profile knotless configurations:

- Interlinked knotless medial pulley
- Medial mattress/medial rip-stop
- Lateral dog-ear reduction
- Delivery of interposition DBM grafts such as AlloSync™ biobutton
- Delivery of ArthroFLEX® dermal allograft for rotator cuff augmentation
- Upper border subscapularis repair with concomitant Loop ’N Tack” biceps tenodesis

*ArthroFLEX is a registered trademark of LifeNet Health.
Acetabular Labral Repair and Reconstruction Using the Knotless 1.8 Hip FiberTak® Soft Anchor

The next-generation, self-tensioning Knotless Hip FiberTak soft anchor can be easily inserted through straight and curved drill guides and requires a small, 1.8 mm bone socket, making it one of the smallest knotless anchors available for acetabular labral repair and reconstruction. In addition to its small size, this implant’s adjustable tensioning ensures precise placement of the labrum, helping to avoid labral eversion away from the femoral head and maintaining the suction seal of the hip joint.

Advantages

- Adjustable tensioning to control labrum positioning
- No risk of knot impingement or loosening
- Simple, reproducible percutaneous insertion techniques
- Easily maintain the drill guide trajectory while drilling and inserting the implant
- Available with curved and straight drill guides

References

Two-Incision Distal Biceps Tenodesis Implant System

The Two-Incision Distal Biceps Implant System provides everything needed to perform a distal biceps repair from a posterior/anterior approach using two 7 mm tenodesis buttons. The 2-button onlay technique can help place the biceps tendon in a more anatomic position over the traditional trough and tunnel technique. An additional feature of the 7 mm × 2.6 mm tenodesis button is that it can flip easier inside the radius compared to longer buttons.

Knotless 2.6 FiberTak® Soft Anchor

The Knotless 2.6 FiberTak soft anchor combines the benefits of a soft anchor with those of a broad #5 repair suture for soft-tissue fixation. This anchor uses the same tensionable knotless technology as the Knotless 1.8 FiberTak soft anchor:

- Suture repair tension can be controlled and adjusted under direct visualization
- Minimum bone removal with 2.6 mm drill
- No risk of knot impingement or loosening
- Simple, reproducible insertion and passing techniques
- Procedures using the Knotless 2.6 FiberTak soft anchor:
  - Instability repair
  - Upper border subscapularis repair
  - Interconnected PASTA bridge
  - Interconnected remplissage

2.6 FiberTak Soft Anchors With Self-Punching Inserter for Rotator Cuff Repair

The self-punching inserter for select 2.6 FiberTak soft anchors allows for direct insertion into bone without a prepunched or predrilled socket for anchor insertion. The inserter can be used with or without a guide and can be placed directly into bone or used with a transtendon insertion technique.

PassPort Button™ Cannula Divider

Suture management can be one of the most challenging parts of complex shoulder cases like SCR. This new accessory helps by creating divided channels within the 12 mm PassPort Button cannula through which sutures can be retrieved, keeping them separated and untangled.

- Allows for easy and clear separation of sutures
- Removable once graft is ready to be introduced
- Works well with all standard suture and tape retrievers

3.9 mm SwiveLock® Anchor

This new 3.9 mm SwiveLock anchor, which is available in both PEEK and biocomposite materials, introduces a large eyelet design within a small footprint. The large eyelet size makes the anchor easy to use with FiberTape® suture, and its deep threads allow for strong fixation. The anchor’s small size is helpful when incorporating additional fixation points where space is limited or in small spaces where a deeper thread for robust fixation is preferred.

- Smaller vented anchor makes it ideal for tight spaces
- Suture eyelet easily accommodates 2 FiberTape or 3 SutureTape sutures
- NEW hexalobe driver for high insertional torque of the anchor in hard bone

Reference

Univers Revers™ Apex Humeral Stem

The Univers Revers Apex stem is shorter in length and offers the same proximal fixation geometry as the traditional length Univers Revers stem, which has been implanted in more than 50,000 patients since 2012.1

- Reduced intraosseous footprint
- Allows for both 135° and 155° inclination angle
  - Calcium phosphate coated
- Potentially conserves more bone during revision arthroplasty
- Shorter stem length may aid in placement during periprosthetic implantations
- Addition of lateral suture eyelets for soft-tissue repair
- May be used with any SutureCup from the Univers Revers System

Next-Generation VIP™ Glenoid Targeter

Web-based, preoperative planning with the VIP System helps surgeons plan anatomic and reverse shoulder arthroplasty procedures using patients’ CT scans in a 3-dimensional space. Arthrex shoulder arthroplasty glenoids can be used with the system, including the Univers VaultLock® glenoid system for anatomic shoulder replacement and the Univers Revers™ shoulder systems for reverse shoulder arthroplasty.

This next-generation, reusable glenoid targeter reduces calibration steps and the time required to dial in the approved preoperative plan. The targeter facilitates intuitive one-handed calibration with tactile feedback. It is designed for use in a wider range of patient anatomies as the targeter handle is longer and has recessed legs for an enhanced view of targeter engagement with the native glenoid. In conjunction with the glenoid targeter, a Nitinol pin will be released, which will allow for easier insertion of the cannulated glenoid preparation instrumentation while maintaining the desired trajectory.

Hallux Rigidus Arthroplasty

With ArthroFLEX® Dermal Allograft

The ArthroFLEX dermal allograft is a motion-sparing, protective covering for hallux rigidus of the 1st metatarsophalangeal (MTP) joint.1 Osteoarthritis of the 1st MTP joint is the most common arthritic condition in the foot, affecting 1 in 40 people over the age of 50.2 Progression of great toe arthritis is associated with pain and loss of motion. ArthroFLEX dermal allograft is a protective bio-implant that allows patients to retain the ability to move the MTP joint without the need for fusion.

*ArthroFLEX is a registered trademark of LifeNet Health.

References
Arthrex partnered with Fidia Pharma USA, Inc. in late 2019 to distribute and inform surgeons about Fidia’s hyaluronic acid products. Hyaluronic acid (HA), a substance naturally found in healthy joints, is FDA-approved as an injection treatment for pain associated with osteoarthritis of the knee.

Arthrex offers a 2-injection series Fidia product, called HYMOVIS®, and a 5-injection series Fidia product, called HYALGAN®, and will expand to offer a 3-injection Fidia product, TRILURON™, in 2020.

While HYALGAN has been on the market for some time, HYMOVIS high molecular weight viscoelastic hyaluronan is new and different from other HA products on the market. HYMOVIS has a unique molecular structure that gives it enhanced biomechanical properties. Unlike other HA products, it is not chemically cross-linked, instead incorporating alkyl side chains, which results in reversible hydrophobic interactions that increase viscosity and elasticity.

Arthrex faculty member Adam Anz, MD, is interested in the composition of HYMOVIS and is currently studying it in combination with other biologics products in an investigator-initiated study through a grant he received from the state of Florida.

“HA has been around for decades as a treatment for osteoarthritis knee pain and Fidia Pharma was the first when they developed HYALGAN in 1987. They developed the largest body of research with it and it was helping people. Since then, a lot of companies have followed in Fidia’s footsteps to bring other HA’s to the market,” he said. “But there is ambiguity about what works and what doesn’t. We want to provide the science to say what works and what doesn’t.”

Dr. Anz, who has been in the biologics space since 2009, said his research is focused on determining whether combining HA with biologics has value. He said while there are animal data to support this, work with humans has yet to be performed.

Currently, 60 patients are enrolled in his study. Dr. Anz said HYMOVIS will continue to be a focus area of his research because of the unique and minimally modified molecular structure, which provides a greater reduction of friction than other HA products.

“As the interest in regenerative medicine grows, there has been so little research that patients will start to ask questions, to find out if treatments live up to the hype,” he said. “While some companies make big statements about their products, some products like HYMOVIS have the FDA approval and clinical trials to support the claims they are making, which is a big step forward.”

Preclinical data may not be indicative of human clinical outcomes. Data on file, Fidia Farmaceutici S.p.A.
You have had considerable clinical experience and success with the InternalBrace system since 2014. Why consider the InternalBrace 2.0 system?

We’ve performed many InternalBrace ligament augmentation procedures in my practice, not only in the foot and ankle but also in the hand, wrist, knee, elbow, and shoulder. InternalBrace repair has greatly impacted our patients and transformed their recovery and return to function. The InternalBrace procedure has decreased surgical time and diminished morbidity involved with traditionally more extensive procedures. The new system includes all the latest improvements that facilitate InternalBrace ligament augmentation. Whether you are performing the procedure open, mini-open, or arthroscopically, the new kit optimizes instrumentation with a variety of size and material options.

- **Talus offset guide**: uniquely designed for reproducible placement of the talar SwiveLock® anchor. You can use the same guide to place a guidewire, drill, tap, and insert an anchor without losing your position.

- **Radiopaque marker and laser line window**: completely eliminates guesswork as to whether the anchor is completely seated.

- **Biologic advantage**: collagen-coated FiberTape® suture allows for better native tissue incorporation and JumpStart® dressing helps reduce microbial load.

- **Biomechanically superior to standard repair**: my athletes and laborers can return to full activity much quicker.

- **Cannulated drill and tap**: allow for better precision and safety in anchor placement (specifically with sustentaculum anchor) when used for spring or deltoid ligament repair with augmentation.

**Patient Selection**

**Lateral ligament repair with augmentation**

Whether the patient is a high-demand athlete or a weekend warrior, InternalBrace ligament augmentation has allowed me to accelerate their rehabilitation and return to activity, especially in the following settings:

- A moderate to severe instability where tissues have been stretched or thinned
- A high-demand athlete who may need the checkrein to allow expedited return to play
- For revision cases where there is attrition of remaining tissue, or
- In many cases where tendon augmentation was the only option

**Spring ligament/deltoid repair with augmentation**

- Same patients as for posterior tibial tendon reconstruction (PTTD)
- Prevent stretching of native ligament repair whether performing isolated reconstruction or in the setting of PTTD
- Allows for a separate limb of the InternalBrace construct to be secured to the medial malleolus for augmenting the anterior deltoid fibers and tibiospring ligaments
Lastly, for those surgeons who have yet to incorporate Internal Brace technology in their foot and ankle ligament repairs, what guidance would you provide?

- Start with open repair prior to proceeding with minimally invasive approaches.
- Use the cannulated drill and tap to confirm appropriate anchor site and avoid the pitfalls of improper anchor placement.
- This system will positively impact your practice.

Is there a research update? What’s in the press?

- Coetzee et al. investigated the outcomes of 81 patients who underwent a Brostrom repair with Internal Brace augmentation. Their patients had an average postoperative AOFAS score of 94.3 and were able to participate in an accelerated rehabilitation process that allowed athletes to return to sports as early as 8 weeks post-surgery.
- Viens and colleagues found that a repair including the Internal Brace implant was at least as strong and stiff as the native ATFL at time zero in cadaveric models.
- Schuh et al. performed 3 repairs on cadavers: a traditional Brostrom repair without anchors, suture anchor repair, and suture anchor with Internal Brace augmentation. The highest torque-to-failure and angle-to-failure were found in the Internal Brace group.
- Xu et al. compared the Brostrom-Gould to the Brostrom-Gould with Internal Brace augmentation and measured functional outcomes using the FAAM scale. Differences in return to functional sports activity were attributed to earlier mobilization and rehabilitation, as well as the protection against elongation of the ankle ligaments provided by the Internal Brace implant.
- Acevedo presented on 42 patients who underwent arthroscopic Internal Brace procedures, with a mean follow-up of 33 months. The results demonstrated a significant increase in both AOFAS and FAAM scores with a return to activity of 18 weeks.

Technical Tips and Pearls for Applying the System to Both Lateral (ATFL) and Medial (Spring and Deltoid) Repairs With Augmentation

- Avoid over-constraining the joint by placing the Internal Brace construct in the correct anatomic location and insertion of the second anchor while holding the foot in neutral inversion/eversion with 10° to 15° of plantar flexion (for placement of ATFL Internal Brace augmentation).
- Adhere strictly to the published technique.

References
Q: Can you tell us about your experience using stemless technology?

A: It’s been good. I’ve used another company’s device for several years so I have a fair bit of experience with stemless shoulders. I use stemless 100% of the time unless the bone is horrible, which is an intraoperative decision. Once cleared by the FDA, I switched to using the Eclipse implant.

Q: What piqued your interest in the Eclipse System?

A: I had a patient who had a slight proximal humerus malunion. The tuberosities were fine, but I wanted to do an anatomic total shoulder, and I just felt like I wasn’t going to be able to get a stem down the humeral canal. It was a good opportunity to try it and it went well. Then I started using it more because it made sense, especially in terms of reproducing the native center of rotation for the humerus. If you can recreate the humeral anatomy better, then maybe it will lead to glenoid longevity.

Lately, there’s been significant discussions on how to best repair the subscapularis with stemless devices. Arthrex is working on some innovative solutions that I expect to see in the near future.

Q: Can you describe how preoperative planning with the VIP System has impacted your patients’ educational experiences.

A: I tell patients “I do your surgery on the computer before we do it in the OR and I think this is something that is going to be the standard in the future.” It allows us to do more accurate surgery and make more informed decisions. It enables my team and I to ramp up the speed of the operation because I very rarely trial or template. We did a reverse in 21 minutes the other day. An anatomic takes me about 30-45 minutes because there’s no trialing and templating. The computer suggests a plan and I review and approve it. I trust the computer because I have yet to disagree with any of plans. Then the Technology Consultants have an idea of what we are going to implant ahead of time. They inform the scrub technicians and everything is preset and premade for that patient. I could go on, but those are the main benefits. Patients like the idea that they are getting a personalized procedure.

Q: Can you tell us about your experience using stemless technology?

A: It’s been good. I’ve used another company’s device for several years so I have a fair bit of experience with stemless shoulders. I use stemless 100% of the time unless the bone is horrible, which is an intraoperative decision. Once cleared by the FDA, I switched to using the Eclipse implant.

Q: Is there anything you do to uniquely prepare for an Eclipse procedure, or is there anything you are especially cautious of during the procedure?

A: No, but I do use the VIP System for accurate positioning of the glenoid implant.

Q: What are the advantages to using the Eclipse implant compared to competitive implants?

A: First, the Eclipse implant is the only stemless device with excellent long-term clinical data.

Second, in my opinion, the Eclipse implant recreates the anatomy better, preserves more bone, and has decreased my OR time. It just makes sense.

Finally, revision scenarios are less complicated due to bone preservation with the Eclipse implant versus competitive implants. This gives me more options should revision to reverse arthroplasty be required. Though both inlay and onlay reverse systems can be used after Eclipse implant removal, I prefer an inlay system such as the Univers Revers™ System. This versatility may not be an option in revision scenarios with competitive systems.
Q: Have you observed any changes in patient outcomes since you started using the VIP System? Is there anything specific about the 3D model option that might impact surgical confidence?

A: I’ve always used a computer for my cases. The VIP System has been an important part of my practice since it launched. The technology is there, why not use it?

I usually order a 3D model if I’m planning on using a partial graft. It’s nice to be able to put the bone graft on there. If you aren’t going to use a graft, the 5D calibrated targeter is sufficient for moderate deformities and I trust it. It’s also a simple system. The learning curve is flat and I can’t think of a reason not to use it. The digital shoulder is here.

Q: How have your patients benefited from the Eclipse and VIP Systems?

A: My patients have benefited because they have a shoulder arthroplasty that is a more accurate recreation of their anatomy, while preserving as much bone as possible should they need an eventual revision. If they are getting an anatomic shoulder, it will be an Eclipse implant because I don’t see any reason not to. It’s quicker and simpler, adding real and theoretical benefits. Some surgeons might say “This is silly. You are solving a problem that isn’t there,” but I promise you once they do it, they’ll want to keep doing it. I’m a firm believer in stemless shoulder arthroplasty and the VIP System for the best patient outcomes.
Dr. Anderson discusses the benefits of the 2.2 mm single-use NanoScope™ system and the impact a less-invasive imaging tool has on his facility and patients. The portability of the NanoScope visualization system allows surgeons to perform minimally invasive arthroscopy in the operating room, in a procedure room, or diagnostically in the physician’s office. The NanoScope system provides an alternative advanced option to MRI and second-look arthroscopy, and the ability to guide injections under precise visualization.

**Q: Why use the NanoScope camera and Nano arthroscopy instrumentation versus your traditional visualization systems and instrumentation?**

A: As with most major developments, the goal is to treat the condition while minimizing invasiveness and morbidity. Specifically for the knee, the NanoScope system offers the potential advantages of:

1) Minimal portal thickening and scar tissue formation. This allows for quicker restoration of normal extensor mechanism function.

2) Less overall knee distention and less swelling postoperatively. Patients recover faster with even less pain than we already see with arthroscopy. I can even anticipate this allowing for some in-season treatment of athletes without significant time lost.

For shoulder, I think the treatment of labral issues and biceps issues while minimizing portals through the rotator cuff tissue and subacromial space will likely allow for faster recovery and return of coordinated muscle activity. This will be huge for overhead athletes.

**Q: For diagnostic imaging, what patients benefit most from NanoScope technology? As a high-level NFL team physician, how can the NanoScope system speed up time to diagnosis and recovery for faster return to play?**

A: Certainly this could be a way to gain immediate information in the office in terms of the presence of a rotator cuff or labral tear. Similarly, meniscal tears or cartilage lesions in the knee can now be detected right away. This would greatly improve the current process of scheduling an MRI or ultrasound appointment, gaining approval, getting results, scheduling a follow-up appointment to review those results, and then deciding the best course of treatment. This can often take weeks.

For elbows, this can be a great way to confirm valgus laxity in a thrower and could limit the need for MRI or dynamic ultrasound.

As for speeding up the time to diagnosis and recovery, I will say that was one of my immediate thoughts as soon as I heard of this technology. I think this may allow much more in-season management of injuries and greatly reduce missed game time.

**Q: Which procedures have you performed with the NanoScope visualization system? What are your post-op protocols after a NanoScope procedure and does this differ from standard arthroscopy?**

A: In this initial launch, I have performed partial meniscectomies and debridement chondroplasty. We’ve also been working on a SLAP repair and this is really the ground floor of where the technology will go in treating our patients better.

As for post-op protocols, I haven’t done enough volume yet to note generalized changes, but certainly, knee patients may get to more vigorous activity sooner since there is minimal or no fat pad inflammation or thickening.

**Q: In which site-of-care settings are you using the NanoScope system and has this been an adjustment to you and your facility? In the future, do you see procedure rooms for immediate diagnosis in the stadium?**

A: I am currently using the NanoScope in the OR at the surgery center but I plan to move some cases into the procedure rooms to free up OR space and eventually I will use the system in the office setting.

Also, procedure rooms in stadiums are certainly a possibility, if not at least at the team practice facility. I can see it being used in a Monday post-game injury clinic for diagnostic purposes and even for some treatments.

Overall, Nano arthroscopy could be a giant step similar to the advent of arthroscopy itself.
FiberTape® Cerclage

Nonmetallic, suture-based FiberTape cerclage was developed to replace metal wires and cables. Its unique ultra-high molecular weight polyethylene design delivers uncompromising strength and biomechanical performance to effectively manage periprosthetic fractures in the upper and lower extremities. It provides all of the known advantages of nonmetallic cerclage such as no sharp metal edges to cause wire-stick injuries and is 100% radiolucent, eliminating metal artifacts on X-ray.

With its broad, low-profile design, FiberTape cerclage is unlike any other system on the market. Since the cerclage lays flat, plates can be fixated over it and still be flush against bone.

Incorporating FiberTape cerclage into the OR is simple. Its universal construct allows it to be used in conjunction with any implant and plating system. Instrumentation is streamlined and fits into a single tray with no bulky crimpers or wire cutters. Plus, FiberTape cerclage is packaged onto a loading card for reliable and reproducible execution every time.

1. Load the tail of the cerclage suture through the needle eyelet. If using a passing hook, load a FiberLink™ suture along with the cerclage suture into the eyelet. Pass the needle or passing hook around the bone.

2. Load the tail of the cerclage suture into the suture shuttle on the needle or FiberLink suture if using a passing hook. Shuttle the cerclage suture around the bone a second time.

3. Load the tail of the cerclage suture through the suture shuttle (#1 on the card). Hold the card at the bullseye (#2 on the card) and shuttle the cerclage suture through the pretied knot by pulling on the opposite loop (#3 on the card). Remove the card and discard the suture shuttle. Reduce the knot close to the bone and remove the gross slack from the cerclage loops.

4. Cut the tape so there are 2 limbs. Insert one limb through the bottom hole at the distal end of the tensioner and the other limb through the slot. Both tails should then be loaded together through the slot near the handle.

5. Place the tensioner against the knot and begin to tension the tapes. Tension until the slack is removed from the loops. Avoid bottoming out the spring in the tensioner.

6. Press the release button on the tensioner and remove the suture limbs. Tie 1 half-hitch. Reload the suture limbs into the tensioner and do a final tension. Tie 2 alternating half-hitches to complete the repair. Repeat the sequence for subsequent cerclage.

Biceps Tenodesis: Location Comparison

Purpose
To compare the early clinical outcomes of pain, function, and quality of life for patients who underwent biceps tenodesis fixated at the top-of-the-groove, supraperatorial, or subpectorals regions.

Method
The inclusion criteria for this analysis were patients enrolled in the Surgical Outcomes System™ global registry who underwent biceps tenodesis fixated at the top-of-the-groove, supraperatorial, or subpectorals regions based on site data entry. Standard patient-reported outcomes questionnaires for VAS, ASES Function, and SANE were administered at standard time points postoperatively. Results were reported from presurgery to 2 years postsurgery.

The numbers of compliant patients included per group are shown below.

<table>
<thead>
<tr>
<th>Time Point</th>
<th># of Compliant/ Total # Surveys Sent Top-of-the-Groove Patients</th>
<th># of Compliant/ Total # Surveys Sent Suprapectoral Patients</th>
<th># of Compliant/ Total # Surveys Sent Subpectoral Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presurgery</td>
<td>1161/1547</td>
<td>723/1080</td>
<td>1327/1863</td>
</tr>
<tr>
<td>1 year</td>
<td>623/1065</td>
<td>437/783</td>
<td>913/1649</td>
</tr>
<tr>
<td>2 years</td>
<td>288/562</td>
<td>244/462</td>
<td>664/1276</td>
</tr>
</tbody>
</table>

Results

Visual Analog Pain Scale (VAS)

Trend Conclusion
Based on these results for biceps tenodesis location, there appears to be a similar trend in pain, function, and quality-of-life scores for tenodesis performed at the top-of-the-groove, supraperatorial, and subpectorals regions. However, no claims can be made on the potential of these results without further analysis to determine if there is statistical significance.

Reference