# Flexor to Extensor Tendon Transfer

Bio-Tenodesis™ Screw Fixation for Stabilization of the Lesser Metatarsophalangeal Joints

Arthrex®

# Bio-Tenodesis Screw Fixation

## *Overview*

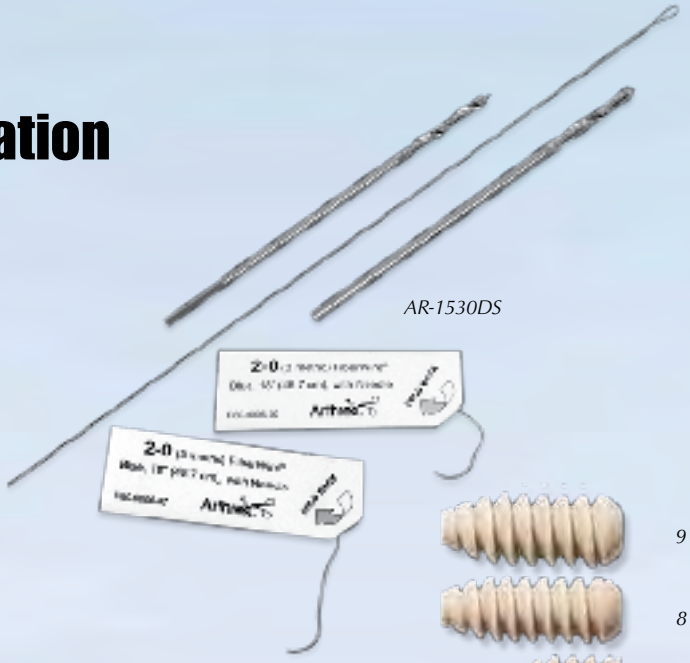
Capsular instability of the second metatarsophalangeal joint (crossover second toe deformity) is a relatively common source of metatarsalgia. There are a number of methods of surgical treatment to correct the instability. Stabilization of the second metatarsophalangeal joint is required and often includes a flexor tendon transfer. This surgical technique describes the "flexor to extensor" FDL tendon transfer procedure, using a 3 mm x 8 mm Bio-Tenodesis Screw for fixation in the proximal phalanx, without the need for a plantar incision. This technique may be done in conjunction with associated hammertoe repair, MTP arthroplasty and metatarsal shortening, as described by Paul Shurnas, M.D., in the article: *Second MTP Joint Capsular Instability with Clawing Deformity: Metatarsal Osteotomy, Flexor Transfer with Bio-Tenodesis, Hammertoe Repair, and MTP Arthroplasty without the Need for Plantar Incisions, (November, 2005 Techniques in Foot and Ankle Surgery)*.

## *Bio-Tenodesis Screw System*

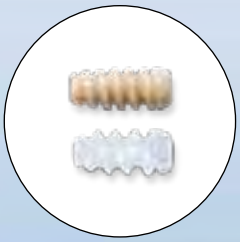
The 3 mm x 8 mm Bio-Tenodesis Screw is the smallest screw in a system that offers the small joint surgeon diameter sizes between 3 mm - 9 mm and lengths from 8 mm - 23 mm. Unlike the other bio, PEEK and metal Tenodesis Screws, the 3 mm x 8 mm comes with its own driver and easy-to-use disposable instrument sets. Arthrex has continued to enhance this system, being the only company to offer a complete line of interference-fit screws and blind tunnel-tensioning technology, completely designed to meet the needs of the small joint surgeon.

## *The Bioabsorbable Advantage*

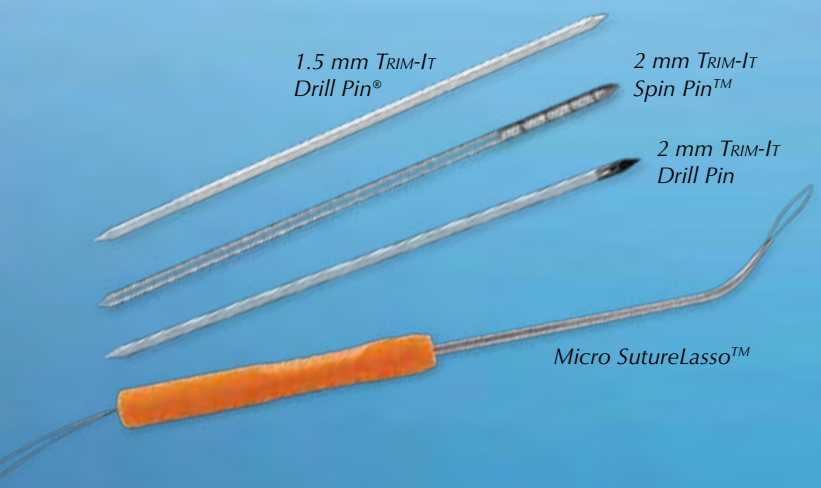
Arthrex's bioabsorbable implant experience is second to none with over 1,000,000 implants successfully placed since 1994. All Arthrex bioabsorbable implants are manufactured from a noncrystalline, amorphous PLLA copolymer that exhibits favorable degradation characteristics to ensure a high time-zero strength that is maintained during the critical 12-week healing stage. Arthrex continues to lead the way in strength and compatibility.




*AR-1530DS*



*3 mm x 8 mm PEEK and bio screws and drivers*

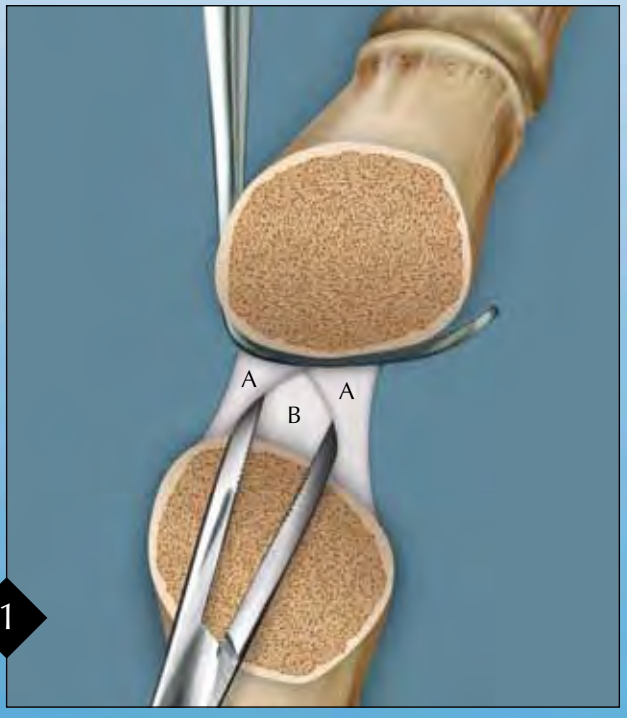



# Indications and Procedure Overview

*Pathology - Painful 2nd MTPJ - Sagittal Plane Instability*

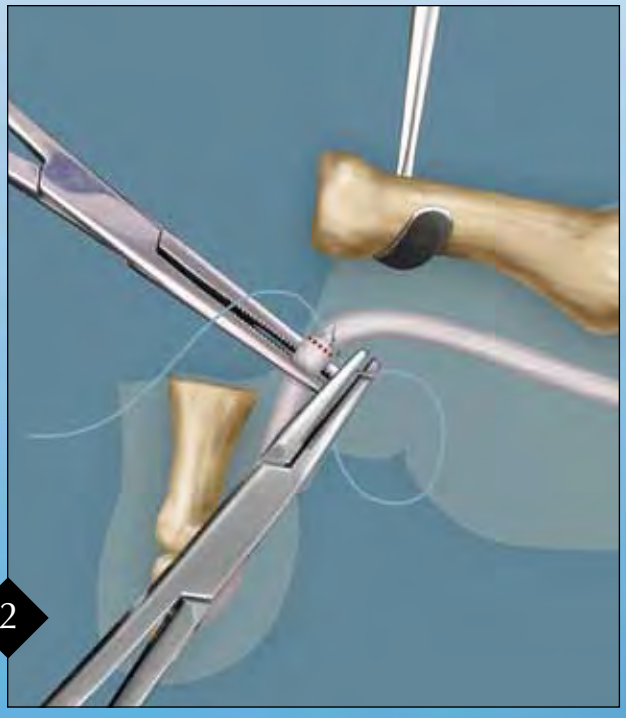
Hammertoe repair is performed when any fixed deformity is present. This is often the case with 2nd MTP joint subluxation or dislocation. When the phalanx base rides dorsal to the metatarsal head, a flexor transfer is performed. The drill hole in the proximal phalanx base is made in the dorsal metaphyseal-diaphyseal junction to allow adequate bone stock for the transfer tunnel and 3 mm x 8 mm Bio-Tenodesis Screw fixation. The phalanx base is reduced to a level position with respect to the metatarsal head by tensioning the flexor transfer until the bony surfaces are aligned.

# Surgical Technique



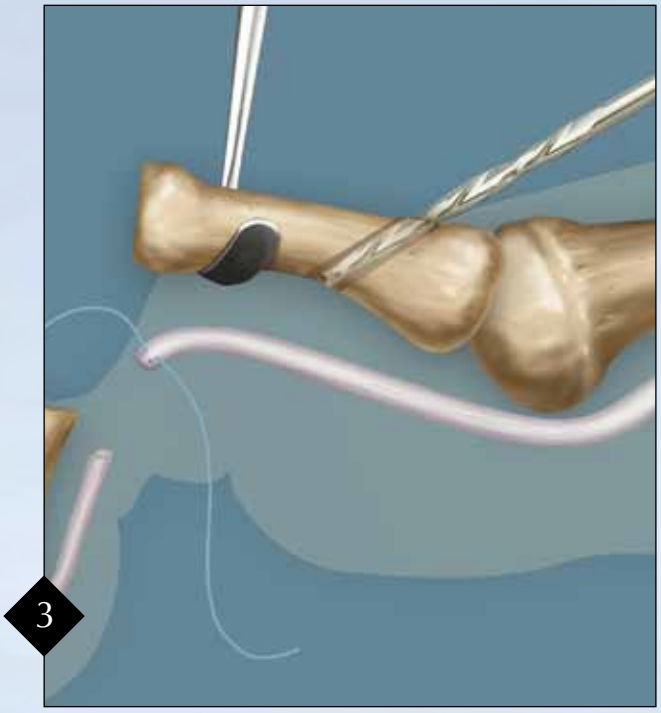

1

The articular cartilage of the head of the proximal phalanx and base of the middle phalanx are resected. The short flexor tendons (A) can be seen just below the retractor. Using blunt dissection, the short flexors are separated and the long flexor (FDL) is exposed (B).

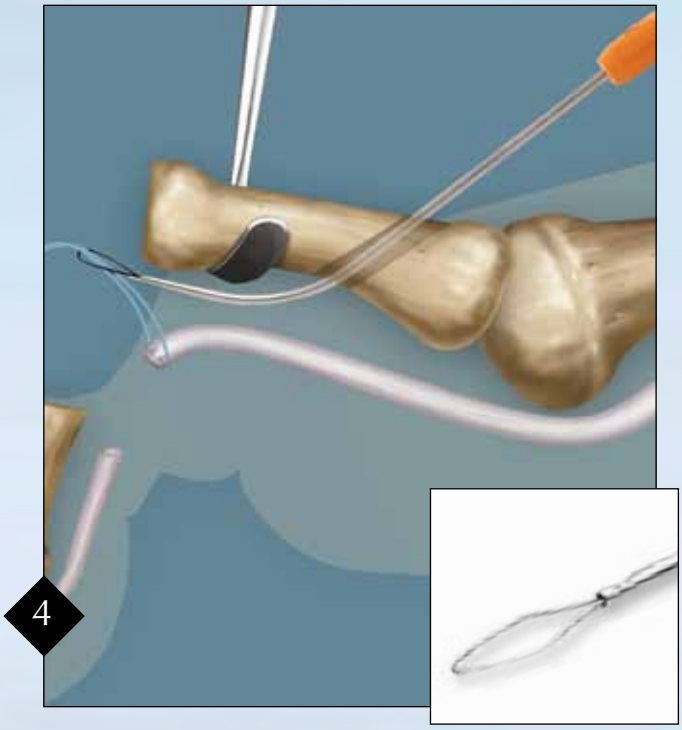


2

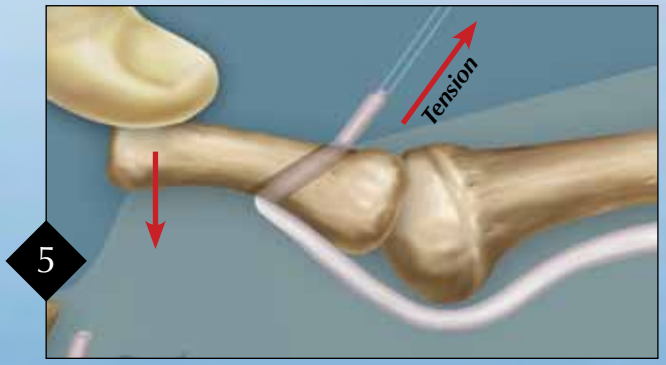
The long flexor is clamped and a traction stitch is added using 2-0 FiberWire®. The stitch aids passage of the tendon from plantar to dorsal through the bone tunnel in the proximal phalanx. The long flexor is cut between the clamp and the traction stitch, as shown with the dotted line. Tendon diameter should be estimated for the drilling phase to follow.

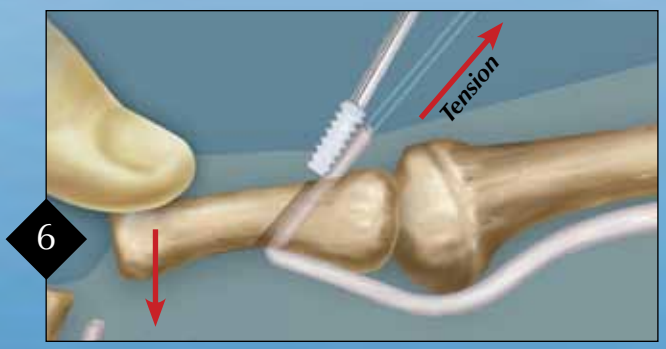



Based on the tendon diameter, a 2.5 mm - 3.5 mm drill is selected. An angled drill hole is made at the base of the proximal phalanx. The oblique drill hole should be made from proximal to distal, and should start not more than 5 mm distal to the MTP joint and exit at the bottom of the phalanx. *Note: Cannulated and noncannulated drills are available for this procedure.*

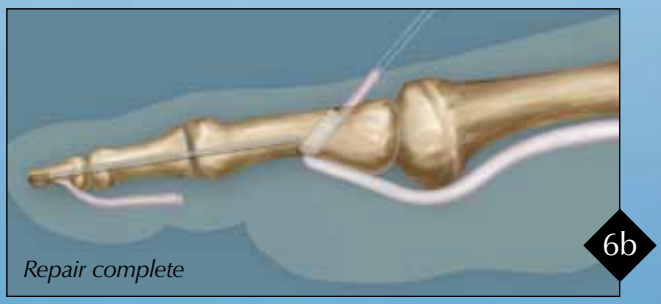


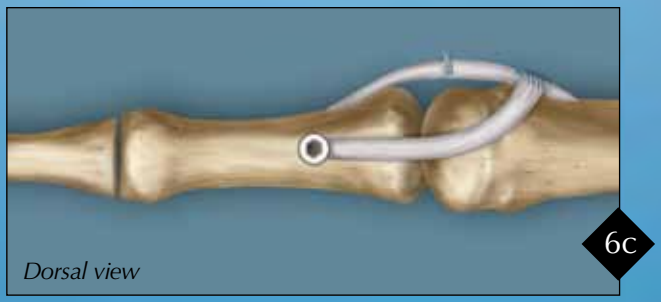

Clear any impinging soft tissues away from the shaft of the phalanx to aid passage of the tendon. A Nitinol wire loop or a Micro SutureLasso is placed in the bone tunnel and directed toward the exposed osteotomy. The Nitinol wire loop is used to snare the FiberWire traction stitch. Once the traction suture is passed through the bone tunnel, the tendon is pulled dorsally through the drill hole. *Note: The tendon tip must be properly sized and tapered for easy passage through the tunnel.*




The proximal phalanx is pushed down to reduce the MTP joint. The tendon should be tensioned as needed to keep the toe in its normal anatomic position (5). The screw is then used to secure the tendon (6 + 6a). Hammertoe repair by insertion of a Trim-It Drill Pin or metal K-wire retrograde from the tip of the toe is added for stabilization. Repair is complete (6b). The medial or more typically lateral capsule soft tissues and ligaments can be repaired with 2-0 and 4-0 FiberLoop® (6c).

## *Ordering Information*

### Implants:

| | |
|---|---|
| Bio-Tenodesis Screw w/handled inserter, 3 mm x 8 mm | AR-1530B |
| PEEK Bio-Tenodesis Screw w/handled inserter, 3 mm x 8 mm | AR-1530PS |

### Optional Implants:

| | |
|---|---|
| 2 mm Trim-It Drill Pin Disposables Kit | AR-4152DS |
| 1.5 mm Trim-It Drill Pin Disposables Kit | AR-4151DS |
| Trim-It Drill Pin, 2 mm x 100 mm | AR-4152B |
| Trim-It Drill Pin, 1.5 mm x 100 mm | AR-4151B |
| Trim-It Spin Pin, 2 mm x 100 mm | AR-4156DS |
| | |
| Tenodesis Screw, 4.75 mm x 15 mm, titanium | AR-1350-475 |
| Tenodesis Screw, 5.5 mm x 15 mm, titanium | AR-1350-55 |
| Bio-Tenodesis Screw w/handled inserter, 3 mm x 8 mm | AR-1530B |
| Bio-Tenodesis Screw, 4 mm x 10 mm | AR-1540B |
| Bio-Tenodesis Screw, 4.75 mm x 15 mm | AR-1547B |
| Bio-Tenodesis Screw, 5.5 mm x 15 mm | AR-1555B |
| Bio-Tenodesis Screw, 6.25 mm x 15 mm | AR-1562B |
| Bio-Tenodesis Screw, 7 mm x 10 mm | AR-1670B |
| Bio-Tenodesis Screw, 7 mm x 23 mm | AR-1570B |
| Bio-Tenodesis Screw, 8 mm x 12 mm | AR-1680B |
| Bio-Tenodesis Screw, 8 mm x 23 mm | AR-1580B |
| Bio-Tenodesis Screw, 9 mm x 23 mm | AR-1590B |
| PEEK Tenodesis Screw, 3 mm x 8 mm | AR-1530PS |
| PEEK Tenodesis Screw, 4 mm x 10 mm | AR-1540PS |
| PEEK Tenodesis Screw, 4.75 mm x 15 mm | AR-1547PS |
| PEEK Tenodesis Screw, 5.5 mm x 8 mm | AR-1655PS |
| PEEK Tenodesis Screw, 5.5 mm x 15 mm | AR-1555PS |
| PEEK Tenodesis Screw, 6.25 mm x 15 mm | AR-1562PS |
| PEEK Tenodesis Screw, 7 mm x 10 mm | AR-1670PS |
| PEEK Tenodesis Screw, 7 mm x 23 mm | AR-1570PS |
| PEEK Tenodesis Screw, 8 mm x 12 mm | AR-1680PS |
| PEEK Tenodesis Screw, 5.5 mm x 10 mm | AR-1655PS-10 |
| PEEK Tenodesis Screw, 5.5 mm x 12 mm | AR-1655PS-12 |
| PEEK Tenodesis Screw, 8 mm x 23 mm | AR-1580PS |
| PEEK Tenodesis Screw, 9 mm x 23 mm | AR-1590PS |
| Disposable Tenodesis Driver w/5.5 mm Screw and #2 FiberWire<br>*includes: driver, 5.5 mm screw, preloaded #2 FiberWire loop* | AR-1555DS |

### Disposables Kit:

Bio-Tenodesis Disposables Kit for 3 mm Screw (AR-1530DS) includes:
- Drill, 2.5 mm
- Drill, 3 mm
- FiberWire sutures w/needles, qty. 2
- Suture Passing Wire, 8 inches

### Optional Accessories:

| | |
|---|---|
| Micro SutureLasso, major bend | AR-8702 |
| 2-0 FiberWire, 18 inches (blue) w/Tapered Needle | AR-7220 |
| 4-0 FiberLoop, 12 inches (blue) w/Tapered Needle | AR-7229-12 |
| 2-0 FiberLoop, 48 inches (blue) w/Diamond Point Needle | AR-7232-02 |