Ankle Syndesmosis

Surgical Protocol by
Timothy Charlton, M.D.
ZipLoop™ Technology is a unique weave in which a single strand of braided polyethylene is woven through itself twice in opposite directions. This construct allows Biomet Sports Medicine to produce innovative products that can vary in length and compression/tension addressing the individual needs of each patient. Products utilizing ZipLoop™ Technology are resistant to slippage without tying knots.¹ Procedure-specific animations, surgical protocols and surgery videos are available at www.ziploop.net.

**Features**

- Low profile, knotless suture fixation system featuring ZipLoop™ Technology
- Fixation alternative to rigid stainless steel screws for repairing ankle syndesmosis joint disruptions
- Available with either titanium or stainless steel buttons to correspond with the surgeon's preferred plating system
- Allows for micromotion during healing which more closely mimics the patient’s true joint mechanics

**Lateral Fixation**

- Round top hat button for lateral fixation
- Can be used directly on the lateral cortex of the fibula or in conjunction with a plating system as deemed appropriate by the surgeon

**MaxBraid™ Suture**

- Medial and lateral fixation devices connected with MaxBraid™ Suture
Indications
The ZipTight™ Fixation System for Ankle Syndesmosis is indicated to repair ankle syndesmosis disruptions and as an adjunct in connection with trauma hardware for Weber B and C ankle fractures.

Note: This surgical technique shows the ZipTight™ Fixation Device used in conjunction with trauma hardware. However, the device can also be used without trauma hardware in length stable fractures as determined appropriate by the surgeon.

Reduce Fracture
Reduce fracture to obtain correct length, rotation, and alignment. Reduce the syndesmosis joint as required to achieve anatomical correction, utilizing bone clamp(s). As determined appropriate by the surgeon, place the surgeon preferred trauma hardware plate and screws, in balanced fixation, on to fibula leaving an additional one or two screw holes empty, where ZipTight™ Fixation Device may be placed to repair the ankle syndesmosis disruption.

Drill Through Fibula and Tibia
Using either a solid or cannulated 3.2mm drill, create a drill pathway at or slightly above the incisura of the tibia at the distal tib-fib joint. Penetrate both tibial cortices with the 3.2mm drill (Figure 1).

Pass the ZipTight™ Fixation Device
After the bone tunnels have been prepared, pass the ZipTight™ Fixation Device pull strands through the tunnels from lateral to medial using the guide pin (Figure 2).

Carefully continue pulling the ZipTight™ Fixation Device pull strand (white MaxBraid™ suture) until the ToggleLoc™ button exits the bone tunnel on the medial side of the tibia. Keeping the device taught from both ends keeps the ToggleLoc™ button angled so that it will easily flip on the medial cortex. As the button exits out of the medial tibial cortex, directing the hand inferiorly may aid in flipping the ToggleLoc™ button. Under fluoroscopic imaging, once the button appears to be out of the medial tibial cortex, pull the device back in the lateral direction so that the ToggleLoc™ button will flip and rest closely against the medial cortex of the tibia (Figure 3).
Zip the Top Hat Button Into Place
Pull on the blue/white ‘zip’ strands (blue/white MaxBraid™ suture) while maintaining tension on the solid blue back-tension strand (blue polyester suture). The solid blue back-tension strand provides slight counterforce to help keep the ZipLoop™ sutures organized (Figure 4).
Continuing to pull the blue/white ‘zip’ strands will bring the round top hat button down against the plate (or lateral fibular cortex if no plate is used) to its final deployed position on the lateral side of the fibula (Figure 5).

Final Tensioning
After the round top hat button is seated, the solid blue back-tension strand can be released and the surgeon can provide final tensioning by pulling on each leg of the blue/white ‘zip’ strand to equalize tension of the legs of the ZipLoop™ strand. A ZipLoop™ puller can be used to assist in final tensioning of the fixation device.
The strands and guide pin can be removed on the medial side. The solid blue ‘back-tension’ strand can be cut and removed and the ‘zip’ strands can be carefully cut down near the round top hat button with scissors or the Super MaxCutter™ Suture Cutter. (Figure 6). Note: No knots need to be tied because the construct utilizes ZipLoop™ Technology.
Postoperative Protocol
Fixation is complete (Figure 7). The patient is placed in a post-operative splint, non-weightbearing until suture removal. Non-weight bearing is maintained for a minimum of four weeks or until sufficient callus ensures length stability of the fibula. A compliant patient can be allowed to do gentle range of motion non-weightbearing at four weeks. In the presence of sufficient fibula healing, protected weightbearing can be started on week six. Advancement to full weightbearing is progressed as clinically indicated.

Removal
The need for removal will be determined by the surgeon. If removal is desired, a small incision over the ToggleLoc™ button on the medial tibia is made to expose the button. Similarly, a small incision is made over the round top hat button on the lateral fibula. Using a blade or cautery, cut both legs of the ZipLoop™ suture at the round top hat button. The round top hat button can be removed. The ToggleLoc™ button and suture can then be removed from the medial side of the tibia.
Diagnosis:

The ToggleLoc™ System devices are intended for soft tissue to bone fixation for the following indications:

- **Shoulder**
  - Bankart lesion repair
  - SLAP lesion repairs
  - Acromion-clavicular repair
- **Hand and Wrist**
  - Capsular shift/capsuloligamentous reconstruction
  - Debridement repair
  - Rotator cuff tear repair
- **Foot and Ankle**
  - Achilles tendon repair
  - Ankle Syndesmosis fixation
  - Tendon transfer in phalanx
  - Scapholunate ligament reconstruction
  - Patellar tendon repair
- **Elbow**
  - Medial/lateral collateral ligament reconstruction
  - Mid- and forearm fracture
  - Hallux valgus reconstruction
  - Metatarsal ligament/tendon repair or reconstruction
- **Knee**
  - ACL/PCL repair or reconstruction
  - ACL/PCL patellar bone-tendon bone grafts
  - Double Tunnel ACL reconstruction
  - Extracapsular repair: MCL, LCL, and posterior oblique ligament
- **Interpositional**
  - Biceps tendon reattachment
  - Ulnar or radial collateral ligament reconstruction
  - Patellar tendon repair
  - VMO advancement
  - Arthroscopy
- **Hip**
  - Arthroplasty

Contraindications:

1. Infection.
2. Patient conditions including blood supply limitations, and insufficient quantity or quality of bone or soft tissue.
3. Patients with mental or neurologic conditions who are unwilling or incapable of following postoperative care instructions.
4. Foreign body sensitivity. Where material sensitivity is suspected, testing is to be completed prior to implantation of the device.

Warnings:

The ToggleLoc™ System devices provide the surgeon with a means to aid in the management of soft tissue to bone reattachment procedures. While these devices are generally successful in attaining these goals, they cannot be expected to replace normal healthy bone or withstand the stress placed upon the device by full or partial weight bearing or load bearing, particularly in the presence of nonunion, delayed union, or incomplete healing. Therefore, it is important that immobilization (use of external support, walking aids, braces, etc.) of the treatment site be maintained until healing has occurred. Surgical implants are subject to repeated stresses in use, which can result in fracture or damage to the implant.

- **Materials**
  - Polypropylene
  - Titanium Alloy
  - Ultra-High Molecular Weight Polyethylene (UHMWPE)
  - Polyurethane
  - Nylon
  - Polyester
  - Stainless Steel

**INDICATIONS FOR USE**

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  - Iliotibial band tenodesis
  - Patellar tendon repair
  - VMO advancement
- **Hand and Wrist**
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  - Scapholunate ligament reconstruction
  - Tendon transfers in phalanx
  - Volar plate reconstruction
- **Foot and Ankle**
  - Achilles tendon repair

**CONTRAINDICATIONS**

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**WARNINGS**

The ToggleLoc™ System devices provide the surgeon with a means to aid in the management of soft tissue to bone reattachment procedures. While these devices are generally successful in attaining these goals, they cannot be expected to replace normal healthy bone or withstand the stress placed upon the device by full or partial weight bearing or load bearing, particularly in the presence of nonunion, delayed union, or incomplete healing. Therefore, it is important that immobilization (use of external support, walking aids, braces, etc.) of the treatment site be maintained until healing has occurred. Surgical implants are subject to repeated stresses in use, which can result in fracture or damage to the implant.

Factors such as the patient’s weight, activity level, and adherence to weight bearing or load bearing instructions have an effect on the service life of the implant. The surgeon must be thoroughly knowledgeable not only in the medical and surgical aspects of the implant, but also must be aware of the mechanical and metallurgical aspects of the surgical implants. Patient selection factors to be considered include:

1. Correct selection of implant is extremely important. The potential for success in soft tissue to bone fixation is increased by the selection of the proper type of implant. While proper selection can help minimize risks, neither the device nor grafts, when used, are designed to withstand the unsupported stress of full weight bearing, load bearing or excessive activity.
2. The implants can loosen or be damaged and the graft can fail if subjected to increased loading associated with nonunion or delayed union. If healing is delayed, or does not occur, the implant or the procedure may fail. Loads produced by weight bearing and activity levels may dictate the longevity of the implant.
3. Inadequate fixation at the time of surgery can increase the risk of loosening and migration of the device or tissue supported by the device. Sufficient bone quantity and quality are important to adequate fixation and success of the procedure. Bone quality must be assessed at the time of surgery. Adequate fixation in diseased bone may be more difficult. Patients with poor quality bone, such as osteoporotic bone, are at greater risk of device loosening and procedure failure.
4. Implant materials are subject to corrosion. Implanting metals and alloys subjects them to constant changing environments of salts, acids, and alkalis that can cause corrosion. Pushing dissimilar metals and alloys in contact with each other can accelerate the corrosion process that may enhance fracture of implants. Every effort should be made to use compatible metals and alloys when facing them with a common goal, i.e., screws and plates.
5. Care is to be taken to ensure adequate soft tissue fixation at the time of surgery. Failure to achieve adequate fixation or improper positioning or placement of the device can contribute to a subsequent undesirable result.
6. The use of appropriate immobilization and postoperative management is indicated as part of the treatment until healing has occurred.
7. Correct handling of implants is extremely important. Do not modify implants. Do not notch or bend implants.
8. Do not use past expiration date.
9. Do not treat implants. While an implant may appear sterilized by exposure to Ethylene Oxide Gas (ETO) if device contains MaxBraid™ PE suture. Do not resterilize. Do not use any component from an opened or damaged package. Do not use past expiration date.

**PRECAUTIONS**

DO not reuse implants. While an implant may appear sterilized, damaged, or excessive force, are susceptible to fracture. Surgical instruments should only be used for their intended purpose. Biomet Sports Medicine recommends that all instruments be regularly inspected for wear and disfigurement.

If device contains MaxBraid™ suture, refer to manufacturer package insert for further information.

**POSSIBLE ADVERSE EFFECTS**

1. Nonunion or delayed union, which may lead to breakage of the implant.
2. Bending or fracture of the implant.
3. Loosening or migration of the implant.
4. Metal sensitivity or allergic reaction to a foreign body.
5. Pain, discomfort, or abnormal sensation due to the presence of the device.
6. Nerve damage due to surgical trauma.
7. Necrosis of bone or tissue.
8. Inadequate healing.
9. Intraoperative or postoperative bone fracture and/or postoperative pain.

**STERILITY**

The ToggleLoc™ System devices are supplied sterile and are sterilized by exposure to Ethylene Oxide Gas (ETO) if device contains MaxBraid™ PE suture. Do not resterilize. Do not use any component from an opened or damaged package. Do not use past expiration date.

Caution:

Federal law (USA) restricts this device to sale, distribution, or use by or on the order of a physician.

Comments regarding the use of this device can be directed to the Regulatory Affairs, Biomet, Inc., P.O. Box 587, Warsaw IN 46581 USA, Fax: 574-372-3968.

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Authorized Representative: Biomet UK, Ltd.
Waterton Industrial Estate
Bridgend, South Wales
CF31 3XJ, U.K.

Manufacturer:

Date of Manufacture:

Do Not Reuse

Consult Accompanying Documents

**STERILE**

sterilized using Ethylene Oxide

sterilized using Irradiation

sterilized using Aseptic Technique

sterilized using Steam or Dry Heat

Sterile

Expiry Date

WEEE Device

Catalogue Number

Lot Number

Flammable

The information contained in this package insert was current on the date this brochure was printed. However, the package insert may have been revised after that date. To obtain a current package insert, please contact Biomet Sports Medicine at the contact information provided herein.
Ordering Information

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<tr>
<th>ZipTight™ Fixation Device for Ankle Syndesmosis with ZipLoop™ Technology</th>
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<th>ZipTight™ Fixation Device for Ankle Syndesmosis with ZipLoop™ Technology Disposable Kits</th>
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Sterile Kit Includes: Implant, 0.062” (1.57mm) x 6” needle crimped onto passing suture, two 0.062” (1.57mm) x 9” K-wires, one 3.2mm x 7.5” cannulated drill bit, and one 3.2mm x 5” solid drill bit.

K-wire

951549 0.045 (1.1mm) x 9” — Pkg. 2 (Non-Sterile)
945019 0.045 (1.1mm) x 9” — Partially Threaded (Sterile)

Cannulated Drill Bit

948086 3.7mm x 5” (Non-Sterile)
948084 3.2mm x 5” (Non-Sterile)

Solid Drill Bit

904301 3.2mm x 5” (Non-Sterile)

Guide Pin

909634 ⅜” x 16” (Non-Sterile)
909540 ½” (Sterile)

ZipLoop™ Puller

904776

Super MaxCutter™ Suture Cutter

900342