CPR™ Complete Plantar Plate Repair System

Arthrex is pleased to add the CPR Viper™ Implant System to the CPR Complete Plantar Plate Repair System. Developed in conjunction with leading experts, this system solves one of the common difficulties encountered by foot and ankle surgeons, lesser MTP joint instability. The CPR Viper can be used with or without a metatarsal osteotomy.

The CPR plantar plate repair system was designed to help prevent floating toe, treat crossover toe, and repair an attenuated or torn plantar plate using a dorsal incision. Historically, techniques to treat a torn plantar plate have used a plantar approach, but many surgeons do not advocate this method because of the amount of dissection, complications with wound healing, and restrictions on postoperative ambulation.

The CPR implant system and instrument set is a comprehensive solution to treat plantar plate pathology. The Mini Scorpion™ DX, Micro SutureLasso™, and Viper™ suture passers provide state-of-the-art options for passing suture in the plantar plate, while the mini joint distractor aids in visualization of this MTP joint stabilizer. The surgical treatment we describe reconstructs the anatomic structures that lead to the instability of the lesser MTP joints. Plantar plate repair, lateral soft-tissue reefing, and metatarsal shortening can restore the normal alignment of the joint.

Incision/Dissection
Place the patient in a supine position on the OR table. Center a dorsal longitudinal incision over the 2nd MTP joint and carry surgical dissection down to the extensor apparatus, where the extensor digitorum longus and brevis are split. Place a self-retaining retractor deep between the extensor tendons to expose the MTP joint.

The collateral ligaments are released from the base of the proximal phalanx, but the collateral ligament attachments on the metatarsal head are left intact.

Osteotomy
Use a McGlamry elevator to make a strict plantarly release of the proximal plantar plate. This will aid in the necessary exposure and advancement of the plantar plate. Leave a substantial soft-tissue attachment on the medial and lateral metatarsal heads.

The Weil osteotomy originates 1 mm-2 mm below the dorsal aspect of the metatarsal articular surface. The angle of the osteotomy should be as close as possible to parallel to the weight-bearing surface of the foot. This angle is important to prevent plantar translation of the capital fragment as shortening is performed.

If osteotomy is not indicated, we recommend the CPR Viper suture passer for passing suture through the plantar plate.
Metatarsal Head Pusher

Once the osteotomy is complete, translate the capital fragment as far proximally as possible (5 mm-10 mm) using the metatarsal head pusher. Temporarily fix the capital fragment in that shortened position with a vertical 0.062”/1.6 mm K-wire. The K-wire should not penetrate the plantar surface of the capital fragment.

Optional: The metatarsal measuring device can be slid over the K-wire and marked to identify the length of the dorsal shelf. Based on this operative measurement, some of the dorsal shelf may be resected to further aid in visualization of the plantar plate.

Joint Distraction

Use the small joint distractor to gain access to the plantar plate. Secure the device to the metatarsal component by using the initial 1.6 mm K-wire. Place another 1.6 mm K-wire from dorsal to plantar 5 mm distal to the base of the proximal phalanx to secure the second arm of the device. Once the distractor is placed, it can be opened to gain dorsal access to the MTP joint and the plantar plate can be clearly visualized.

Alternative Distraction: A right angle towel clamp placed along the sides of the proximal phalanx can be used to create manual distraction. The most common tear patterns are partial and complete distal transverse tears at the distal insertion of the plantar plate. Make the partial tear a complete tear close to the insertion of the plantar plate to the proximal phalanx using a Beaver® 6400 Mini-Blade®, being careful to avoid the flexor tendons. This reflects the plantar plate off the flexor tendon sheath and allows further mobilization of the plantar plate.

Pass Sutures

Mini Scorpion™ DX Suture Passer Technique

When the plantar plate has been completely mobilized, load the Mini Scorpion DX suture passer with 0 FiberWire® sutures. Use a pick-up to stabilize the plantar plate as the Mini Scorpion DX suture passer is inserted into the MTP joint and grasp the plantar plate medially or laterally by pulling the trigger with your fingers. With the Mini Scorpion DX suture passer in place, squeeze the instrument with the palm of your hand, advancing the needle and suture through the tissue. The needle will retract when the handle is released.

Surgical Pearl: When ready to engage the needle and pass the suture in the plantar plate, rotate your hand 30°-45° to prevent the needle from hitting the plantar surface of the metatarsal. When passed through the plantar plate, the suture locks into the “trap-door” feature of the Mini Scorpion DX suture passer allowing for easy retrieval and “blind” shots. The free end of the 0 FiberWire suture is reloaded into the Mini Scorpion DX suture passer and a second stitch is thrown into the plantar plate 3 mm-5 mm medial or lateral to the initial stitch placement.

*Surgical Technique

Beaver 6400 Mini-Blade is a trademark of Beaver-Visitec International (“BVI”) company.
Pass Sutures (Cont’d)

Plantar Plate Pigtail Technique With Micro SutureLasso™ Suture Passer

Once the plantar plate has been completely mobilized, place the right (red) or left (lime) Micro SutureLasso suture passer into the MTP joint. Use a pick-up to stabilize the plantar plate while applying the suture passer to puncture down and up in the plantar plate. Once inserted, push the black lasso forward and pass one of the 0 FiberWire® suture limbs through the loop. Pull the suture passer out, passing an inverted mattress with the suture.

CPR™ Viper™ Implant System

When an osteotomy is not performed, use the preloaded CPR Viper suture passer to pass a cinch stitch in the lateral plantar plate. Reload the suture passer with 0 FiberWire suture and pass a second cinch stitch in the medial plantar plate.

Bone Tunnels

Remove the small joint distractor and the K-wire in the phalanx. Use a right-handed towel clamp to plantar-flex the phalanx. Roughen the plantar edge of the proximal phalanx using a rongeur, curette, or rasp to prepare the surface for reattachment of the plantar plate. Based on surgeon preference, create 2 oblique or 2 crossing drill holes with a 1.6 mm K-wire. It is critical to see the K-wire exit the plantar phalanx just below the articular surface. This will allow for easier suture passing.

Pass Sutures Through the Phalanx

Place the suture retrieval funnel into one of the holes and then insert either the Nitinol loop from the Pigtail Micro SutureLasso instrument or the stout Nitinol suture passer with loop through the retrieval funnel.
Surgical Technique

Suture Tying
With the toe held, reduced on the metatarsal articular surface, in 20°-30° of plantar translation flexion, pull the sutures tight to ensure any slack is removed. Next, tie the sutures over the cortical bridge between the 2 drill holes, thereby advancing the plantar plate onto the proximal phalanx base.

Various suture patterns may be used depending on tears encountered. Additional sutures can be placed to add stability to the repair.

QuickFix™ Cannulated Screw System
Remove the K-wire from the metatarsal. Move the Weil osteotomy to anatomic positioning, holding it with the QuickFix clamp. Affix with one or two 2 mm x 11 mm and 2 mm x 13 mm snap-off QuickFix screws, typically with only 1 mm-2 mm of shortening at the osteotomy site. The clamp helps prevent rotation of the capital fragment and plantar gapping of the osteotomy.

Suture Tying
With the toe held, reduced on the metatarsal articular surface, in 20°-30° of plantar translation flexion, pull the sutures tight to ensure any slack is removed. Next, tie the sutures over the cortical bridge between the 2 drill holes, thereby advancing the plantar plate onto the proximal phalanx base.

Final Without Osteotomy (CPR Viper™ Implant System)
Post-op Protocol
Following surgery, a gauze and tape compression dressing is used to cover the forefoot. Ambulation is permitted in a postoperative shoe with full weightbearing on the heel for 6 weeks. Physical therapy is initiated at 7-10 days following surgery. At day 10 manual exercises commence (passive stretching and active exercises), with emphasis on increasing plantar flexion strength of the involved toe. Full forefoot weightbearing in an athletic shoe is allowed at 6 weeks after surgery, although if the osteotomy heals quickly, weightbearing may be allowed earlier. Activity may progress as tolerated, with aggressive walking at 8 weeks, and jogging or running allowed at 12 weeks.
The CPR Mini Scorpion™ DX and Micro SutureLasso™ Implant System (AR-8690DS) includes the necessary materials for the complete plantar plate repair.

CPR™ Mini Scorpion™ DX and Micro SutureLasso™ Implant System

Scientific Support


Loading of the Scorpion™ Suture Passer

Once the Scorpion suture passer has been loaded, the next steps are to grasp, pass, and retrieve, as indicated in the adjacent illustrations. The Mini Scorpion™ DX suture passer has FastPass technology to automatically retrieve FiberWire® suture after passing through soft tissue. The instrument works well under direct visualization, as well as during “blind” passes through the plantar plate tissue, where access and visualization are often limited.
This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional should rely on their own training and experience and should conduct a thorough review of pertinent medical literature and the product's Directions For Use. Postoperative management is patient specific and dependent on the treating professional’s assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes.


© 2018 Arthrex, Inc. All rights reserved. LT1-0458-EN_D