

Lesser metatarsophalangeal (MTP) joint plantar plate pathologies are a common clinical problem with limited surgical interventions to address them. Most current techniques involve the use of non-absorbable suture or the transfer of native tendon and often place little attention on the anatomical origins of this structure. The technique described below addresses the origin and the insertion of the plantar plate to stabilize the MTP and avoid repeat deformity.

Significant to this technique is the utilization of a novel Dynamic Matrix™. Artelon's FlexBand device immediately aids in the restoration of joint kinematics, resists necrotic mechanical breakdown, and directly participates in the regeneration of connective tissue through its proprietary blend of mimetic strength and elasticity. The combination of this technique and biomaterial offer an advanced surgical intervention for treatment of MTP plantar plate injury.

**REQUIRED IMPLANTS
AND INSTRUMENTATION:**



- 1 Artelon FlexBand (0.3cm x 8cm)
- Drill bit (one 2.5mm cannulated drill and one 3.0mm solid drill)
- Suture (3.0 vicryl to prepare the Artelon FlexBand for passage through the guide holes)
- Suture Passer (Tensor or surgeon's preference)
- Suture Anchor (two 2.5mm tendon anchors)
- Bone Saw (if performing a concomitant Weil type osteotomy)
- Snap off screw of surgeon's choice (if performing a concomitant Weil type osteotomy)
- 10/12mm osteotome and mallet (if performing a condylectomy)
- Optional McGlamry elevator

Notes: Artelon FlexBand is approved to augment, but not replace the plantar plate. This procedure is designed to be performed either with or without a Weil type osteotomy. For purposes of simplicity, this current procedure guide addresses the plantar condylectomy version only. Upon request, additional materials may be provided to describe the Weil type osteotomy version. It has been our experience that, while still occasionally necessary, the Weil osteotomy has become significantly less prevalent while implementing our Artelon FlexBand plantar plate repair technique.

SURGICAL PROCEDURE

STEP 1: A dorsal incision is made over the affected metatarsophalangeal joint (MTPJ), parallel to the long extensor tendon, and the tissues are dissected down to the bony junction. The joint is then dislocated, with the metatarsal head delivered dorsally, affording visibility to the plantar condyles.

STEP 2: Using preferred instrumentation, remove the plantar prominence of the metatarsal head in plane with the weight bearing surface, thereby creating a flush plantar surface. A primary repair of the plantar plate tissue may then be completed.

STEP 3: A 2.5mm cannulated drill bit and 3.0 solid drill bit are sequentially utilized to reduce bone stress in the creation of the metatarsal bone tunnel. The drilling is started just proximal to the metatarsal head, dorsal midline, with an exit portal corresponding to the plantar plate origin site.

STEP 4: The same combination of 2.5mm and 3.0mm drill bit is then utilized to create a phalangeal tunnel. Here the drill is started just distal to the phalangeal base, dorsal midline, progressing obliquely in a plantar proximal direction, exiting near the plantar plate insertion.

STEP 5: Once the bone tunnels have been created, a 2.5mm suture anchor is placed 3mm distal to the bone tunnel in the phalanx. Alternatively, a tenodesis screw may be used to gain Artelon FlexBand fixation.

STEP 6: After soaking for 5 minutes in normal saline solution, a 0.3 x 8cm Artelon FlexBand is presented and suture tails are manually sewn to both ends to facilitate passing and tensioning through the bone tunnels.



STEP 1



STEP 2



STEP 3



STEP 4



STEP 5



STEP 6

SURGICAL TECHNIQUE
PLANTAR PLATE REPAIR
TECHNIQUE UTILIZING ARTELON® FLEXBAND™ TECHNOLOGY

Described by Richard Adams, DPM, FACFAS. (Granbury, TX)

SURGICAL PROCEDURE (CONTINUED)



STEP 7



STEP 8



STEP 9



STEP 10



STEP 11

STEP 7: With the suture tails attached, the Artelon FlexBand can now be threaded through the bone tunnels with the assistance of a suture passer. Pass each end of the prepared Artelon FlexBand through the corresponding guide holes in the metatarsal and phalanx from plantar to dorsal. The Artelon FlexBand itself should course plantar to the MTPJ and remain intracapsular.

STEP 8: The distal (phalangeal) tail of the Artelon FlexBand is then fixed to the bone via the previously placed suture anchor.

STEP 9: A 2.5mm suture anchor is now placed 3mm proximal to the bone tunnel in the metatarsal, and the toe is appropriately positioned by applying axial traction on the proximal tail of the material. This maneuver allows the surgeon to “dial in” the amount of correction desired. Alternatively, a tenodesis screw can be utilized to gain fixation of the FlexBand device.

STEP 10: Once appropriate positioning is achieved, the proximal tail of the Artelon FlexBand is fixed to the metatarsal via the previously placed 2.5mm suture anchor.

STEP 11: After verifying toe position and tensioning, the excess Artelon FlexBand material can be trimmed away prior to final closure.



POST-OPERATIVE CARE

Post-operative bandaging can be modified according to the surgeon's preference. Bandaging the digit in a mildly plantarflexed position for several weeks post-op may reduce dorsal contracture of the capsular scar tissue. Modifications to the post-operative cast boot or surgical shoe may be necessary.

Following the procedure, patients are recommended to rest and elevate for at least three days, limiting their activity to bathroom privileges only. For the first three weeks, a weight bearing below the knee cast boot is recommended. For weeks 4 & 5 a standard post-operative shoe is recommended.

