

Fuse Right Surgical protocol

1. An ankle Esmark 4 inch bandage is used as a sterile tourniquet (a pneumatic ankle, calf or thigh tourniquet may also be used). The MTP (metatarso-phalangeal) joint is approached with an oblique incision, 1.5 cm in length. The Long and short extensor tendons are released transversely. The dorsal capsule, medial and lateral collateral ligaments are sharply released down to the plantar plate, leaving the plantar plate intact.
2. The PIP joint is approached with a longitudinal incision, 1.5 cm in length. The dorsal capsule is sharply delineated and then a transverse capsulotomy is performed, sharply releasing the dorsal capsule and the collateral ligaments. The plantar capsule is then elevated from off the base of the middle phalanx and the head of the proximal phalanx. Excess dorsal capsule and extensor hood is excised down to the level of planned peg length to clear the surgical area.
3. The PIP joint is acutely flexed to expose the proximal phalanx head, and the head is grasped by the surgeon with a forcep, stabilizing the phalanx. An assistant protects the soft tissues with narrow 2-prong skin hook retractors. The 1.5 mm guide hole drill bit is then used to drill an axial guide hole beginning at the inter-condylar notch, at the sagittal midline, drilling down the center of the medullary canal, ending at the base of the phalanx (the MTP joint is not penetrated).
4. The male Fuse Right reamer guide post is then inserted into the pre-drilled hole and the peg is reamed, using care to avoid heating of the bone with a gentle bouncing axial motion until the reamer has reached its end point. Light saline irrigation can be helpful for reducing heat generation.
5. A small rongeur is then used to resect any residual bone or soft tissue remaining around the base of the reamed peg to allow for a flush connection of the fusion site.
6. The base of the middle phalanx is then exposed with a closed adson forcep placed by the assistant under the planter surface of the middle phalanx, lifting the phalanx above the previously reamed peg to avoid inadvertent injury during receptacle reaming. The soft tissues are again retracted for visualization and protection with skin hooks.
7. The 1.5 mm guide hole drill bit is again used to drill an axial guide hole beginning at the center of the articular surface of the middle phalanx with the DIP joint held in an extended position, drilling across the middle phalanx, the DIP joint and across the distal phalanx.
8. The female Fuse Right reamer guide post is then inserted into the pre-drilled hole in the middle phalanx and the receptacle is reamed, again using care to avoid heating of the bone with a gentle bouncing axial motion until the reamer has reached its end point. Light saline irrigation can be helpful for reducing heat generation. The joint is further irrigated to wash away any debris.
9. A 1.6 mm (0.0625 in.) Kirschner wire (threaded* or smooth), or 1.5 mm bio-absorbable pin is driven first retrograde out the end of the toe from the middle phalanx receptacle hole. The fusion peg is then gently inserted into the receptacle using a mild distraction force on the toe while extending the PIP joint. The fusion site is gently compressed together, and while the surgeon holds the fusion in a secure position, an assistant drills the pin anterograde across the PIP joint and to the base of the proximal phalanx (if a smooth wire is used, it may be driven across the MTP joint if toe deviation is present or for surgeon preference).**

10. The pin is trimmed and/or bent and capped, and the tourniquet is released. Hemostasis is achieved, and the wounds are reapproximated with interrupted 4-0 or 5-0 nylon sutures. A forefoot dressing is then applied, and remains in place for the first week. A post-op surgical shoe is applied and used for at least 4 weeks after surgery.
11. The patient is instructed to walk with a foot-forward, flatfoot gait until the pin removal at 4 weeks post-operatively. If an absorbable pin is used, the surgical shoe and gait instructions remain the same to provide adequate protection for healing. Sutures are removed at 2 weeks, and forefoot x-rays (AP and lateral) are obtained at 2, 6 and 10 weeks post-operatively. Dressings are changed at 1 week, and then are fully removed after suture removal at 2 weeks, allowing the patient to shower on a daily basis.

*The technique for use of a threaded 1.6 mm Kirschner wire is identical to that described in step 9, but requires that the direction of rotation of the driver be appropriately applied for advancement of the pin in the desired direction. Crossing the MTP joint with a threaded or absorbable pin is not recommended. Threaded pins are not bent following insertion, and are removed in the office at 4 weeks with a needle driver clamp placed axially on the end of the pin to allow for a rotational “unscrewing” of the pin. This is typically painless, but can be painful at the final 2-3 threads. The clamp is usually removed once easy rotation of the pin is felt, and the final removal is much less painful with finger rotation of the pin.

**The technique for use of an absorbable 30 mm double trocar 1.6 mm pin is as follows: The pin is driven retrograde from the receptacle as instructed for kirschner wires, and is then driven anterograde following insertion of the peg into the receptacle. Once an endpoint is felt (the point of contact with the base of the proximal phalanx), the pin is marked at the skin level with a surgical marker. The pin is then backed out 1 centimeter (approximating the level of the DIP joint) or more, and cut at the level of the skin. The pin is then gently impacted with the implant impactor until the desired level of counter-sinking is reached. Cutting an absorbable pin can sometimes create a crushed “mushroom”. It is helpful to use a small hemostat or needle driver to round out the end of the pin before impacting.