DIGITI ADDUCTUS

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Digiti adductus is relatively uncommon as a solitary deformity. It is more often associated with an adductus deformity at the metatarsophalangeal joint and with hammering of the digit.

The etiology usually revolves around a pronated foot, which causes the digit to adduct as the mechanical vector arm of the long flexor tendons pull the digit into an adducted position. It is also associated with metatarsus adductus, hallux varus, intrinsic instability, paresis of muscles with neurological disorders, and post trauma.

Clinically, this condition presents as a lesser digit which is adducted in the transverse plane. Interestingly, one of the initial patient complaints is "looks like my toes are moving in." As the second and third digits start to adduct, the remaining lesser digits are similarly influenced, and pan lesser digiti adductus can result. Retrograde adductory forces at the metatarsophalangeal joint can result in a tailor's bunion. If an extensus component is present at the metatarsophalangeal joint, the hallux can drift into adductus, creating a hallux abducto valgus deformity.

Early symptoms include a feeling of tightness or stiffness in the digit and metatarsophalangeal joint. This stiffness often progresses to significant pain and morbidity. Heloma molle form as interdigital condylar pressure ensues.

Treatment consists of stabilizing the metatarsophalangeal joint and re-establishing the muscle tendon balance of the intrinsic musculature. The reduction of osseous and musculotendinous abnormalities proximal to this site is also necessary.

Surgical correction is directed toward soft tissue releases, followed by osseous procedures. Metatarsophalangeal joint capsulotomy (dorsal, medial, and plantar) is performed, while maintaining an intact lateral capsule. This is followed by K-wire stabilization across the metatarsophalangeal joint. The wire is directed from distal-medial to proximal-lateral, through the metatarsophalangeal joint and into the metatarsal head. Wire stabilization is maintained for 6 weeks. The patient may come out of the dressing in 2 weeks, and is allowed to bathe. Care should be taken to protect the pins, as contiguous soft tissue pressure may lead to ulceration.

Postoperative pain secondary to pin irritation is proportional to activity level, therefore, an attempt to cover the K-wire will reduce morbidity. The author has used small angiocatheters to cover the pins after they are bent close to skin. Pin rotation can occur, causing the pins to compress adjacent soft tissues. Therefore, extreme caution should be taken when applying postoperative dressings.

CLINICALLY ILLUSTRATED TECHNIQUE

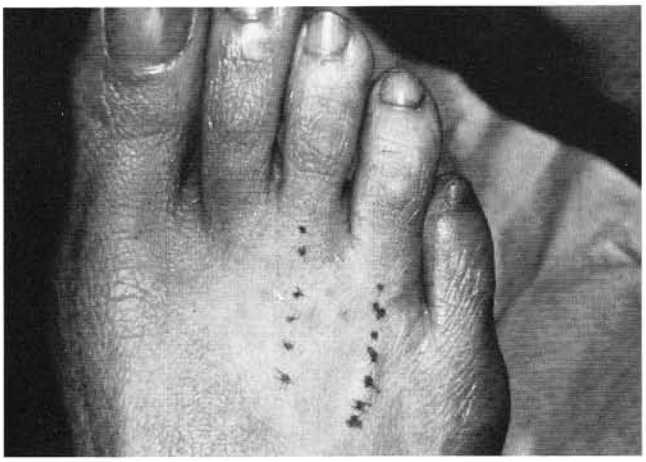

Figure 1. The third and fourth digits are adducted in the transverse plane at the metatarsophalangeal joint (MPJ). Note the resulting tailor's bunion deformity, secondary to medial retrograde forces at the fifth metatarsophalangeal joint. The skin incisions are placed over the digit, minimally crossing the MPJ.

Figure 2. The subcutaneous tissue is reflected exposing the medial MPJ capsule and extensor tendon.

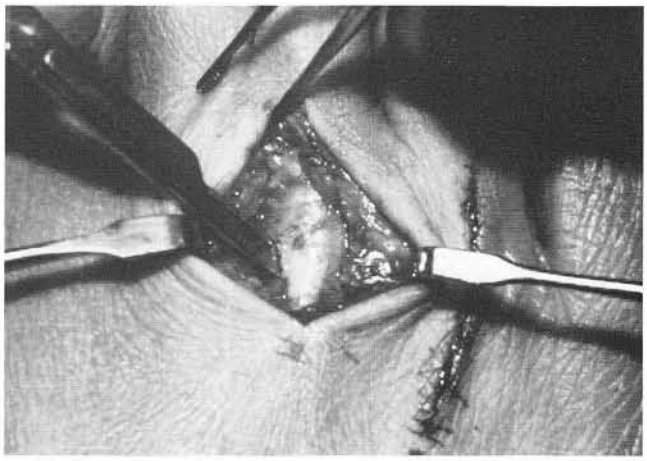

Figure 3. The extensor expansion is incised allowing for lateral retraction of the extensor tendon.

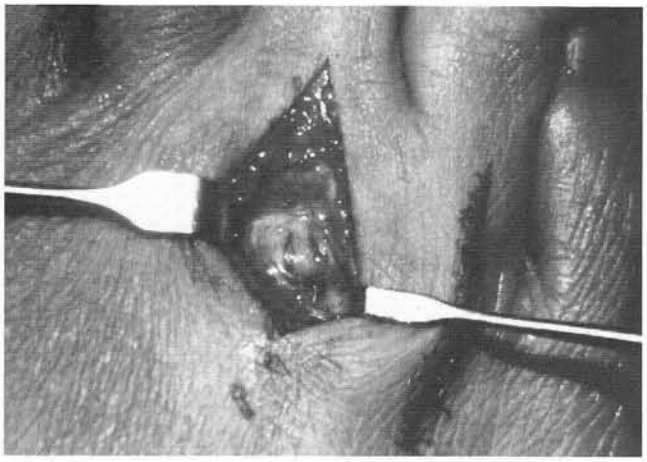

Figure 4. The dorsal and medial MPJ capsule is clearly visualized.

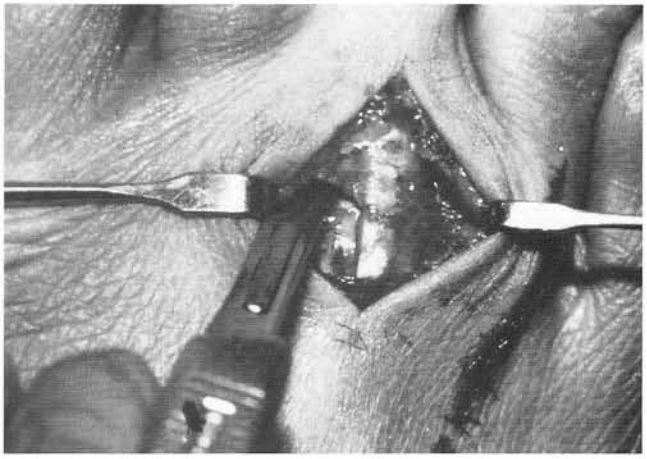

Figure 5. The medial capsule is incised.

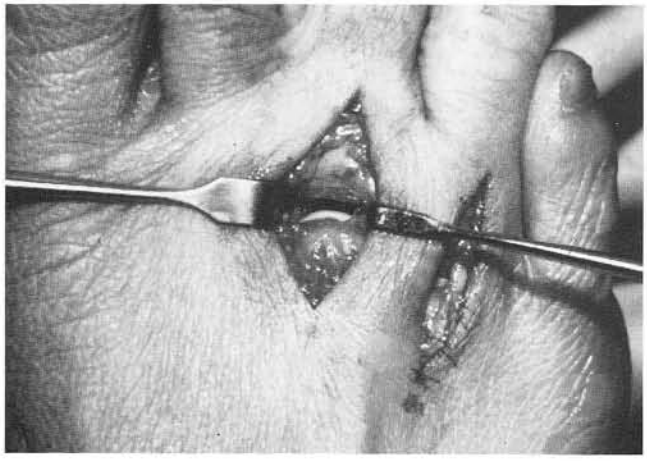

Figure 6. The dorsal, medial, and plantar capsule has been completely mobilized, while maintaining the lateral capsule intact.

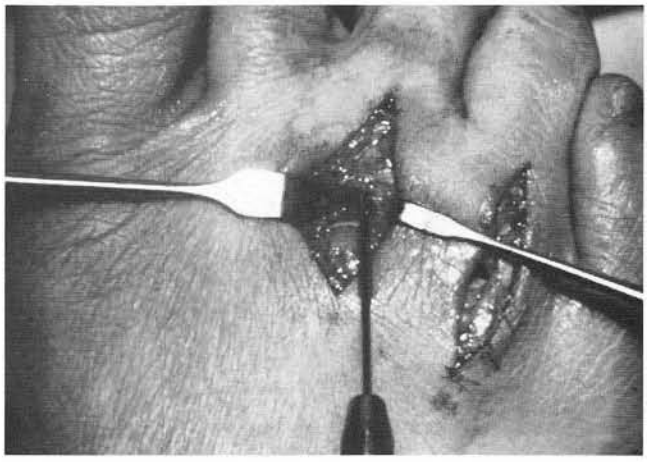

Figure 7. A 0.045 mm K-wire is directed through the proximal phalangeal base, and will exit the medial one-third of the proximal phalanx.

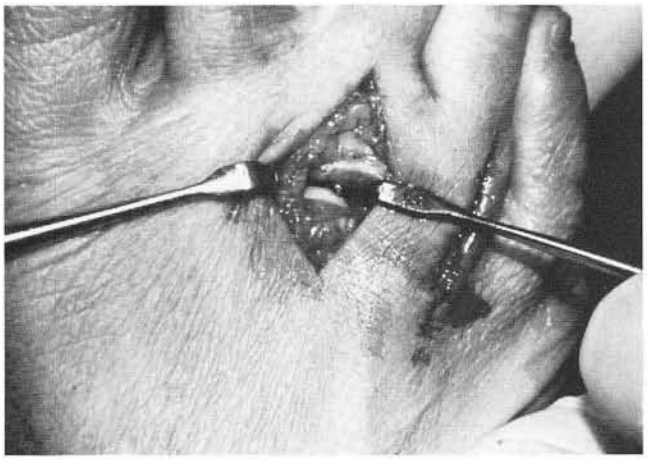

Figure 8. The proximal phalanx is displaced into overcorrection prior to crossing the MPJ.

Figure 9. After stabilizing the MPJ, the K-wire is bent close to the skin. To minimize contiguous tissue pressure, catheter tubing is used to cover the K-wire end.

Figure 10. Corrected position of the MPJ's following layered closure, prior to addressing the fifth ray.

Figure 11. Preoperative DP x-ray demonstrates adduction of the third, fourth, and fifth digits at the MPJ's, and tailor's bunion with increased fourth intermetatarsal space.

Figure 12. Immediate postoperative x-ray demonstrating purposeful overcorrection at the MPJ's, and a closing wedge osteotomy with two 2.0 mm cortical screws for the fifth metatarsal. The patient had bilateral surgery and was non-weight bearing in a bivalved cast for six weeks.

Figure 13. Four weeks postoperatively, the K-wires had rotated minimally but enough to cause severe pain as a result of pin pressure. K-wires were removed at six weeks, and guarded weight bearing was allowed. At six months, the patient was completely asymptomatic.

Figure 14. At 10 months excellent radiographic correction is maintained.

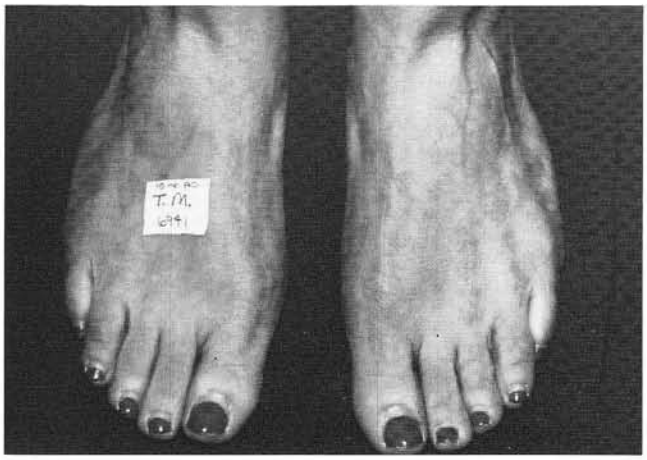

Figure 15. Excellent clinical alignment is established bilaterally.

POSTOPERATIVE CARE

Postoperatively, the patient is allowed to be weight bearing in a surgical shoe. The heel and sole of the shoe are built-up with one-half inch felt or similar material, ending just distal to the digital sulcus to avoid possible bending of the K-wires during ambulation. Ancillary procedures necessitating non-weight bearing and/or casting are occasionally performed. At six weeks the K-wires are removed and weight bearing is allowed. Activity is increased in a routine fashion.

With proper diagnostic acumen, surgical treatment, and maintenance of correction, digital stabilization can be accomplished and secondary post-deformity sequelae such as tailor's bunion, and hallux abducto valgus can be avoided.