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Two-Pin Fixation of Proximal Interphalangeal Joint Fusion for Hammertoe Correction

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ABSTRACT

Single-pin external Kirschner wire (K-wire) fixation has traditionally been a mainstay in proximal interphalangeal joint fusion for central hammertoe repair. Concerns over cosmesis, inconvenience, pin tract infection, hardware failure, nonunion, and early hardware removal have led to the development of implantable internal fixation devices. Although numerous implantable devices are now available and represent viable options for hammertoe repair, they are costly and often pose a challenge in the event removal becomes necessary. An alternative fixation option not typically used is a 2-pin K-wire fixation technique. The perceived advantage of obtaining 2 points of fixation compared with 1 across the fusion site is improved stability against the rotational and bending forces, thus decreasing the potential for pin-related complications. A retrospective assessment of 91 consecutive hammertoe repairs consisting of proximal interphalangeal joint fusion with 2-pin fixation in 60 patients was performed. The K-wires were removed at 6 weeks postoperatively, and the overall postoperative follow-up duration was 28.56 (range 1.40 to 86.83) months. Of the 91 digits, 89 (98%) did not encounter a complication postoperatively and 2 (2.20%) had sustained loosened or broken hardware. No postoperative infection was encountered. The low incidence of complications observed supports the 2-pin K-wire fixation technique as a low-cost and viable construct for proximal interphalangeal joint fusion hammertoe repair.

Proximal interphalangeal joint (PIPJ) fusion is a common surgical repair of central hammertoe deformities. Multiple internal and external fixation options are available, with temporary single external Kirschner wire (K-wire) fixation the mainstay of treatment since its description by Taylor (1) in 1940. K-wire fixation has traditionally been the most popular method of fixation owing to the ease of placement, stability, and maintenance of alignment (2). However, this fixation construct has been a source of recent criticism due to the external nature of fixation for several weeks postoperatively, cosmesis, pin-site infection, and hardware failure requiring early pin removal. The single-pin fixation construct only provides a single point of fixation, increasing the potential for rotation of the digit at the fusion site. These concerns have led to the more recent development of numerous implantable fixation devices, which often cost much more than K-wires. Additional concerns encountered with many implants include the difficulty of removal if this becomes necessary and difficulty pinning across the metatarsophalangeal joint (MPJ) with several devices (especially if implanted fixators are made of dissimilar metals). An alternative option not typically considered is an external 2-pin fixation technique. Although the pins are placed externally, they achieve 2 stable points of fixation across the PIPJ fusion site. The perceived principle advantage is improved stability against rotational and bending forces, thus decreasing the potential for pin-related complications in a manner that, based solely on device costs, typically costs less than fixation with an implantable fixation device. The aim of the present study was to retrospectively assess the incidence of complications associated with use of a 2-pin fixation method as a treatment option for PIPJ fusion in hammertoe repair.

Patients and Methods

After approval from our institutional review board, a review of adult patients who had undergone surgical hammertoe correction of toes 2 through 4 was performed. The patients included in the present study were treated at our institution by the primary

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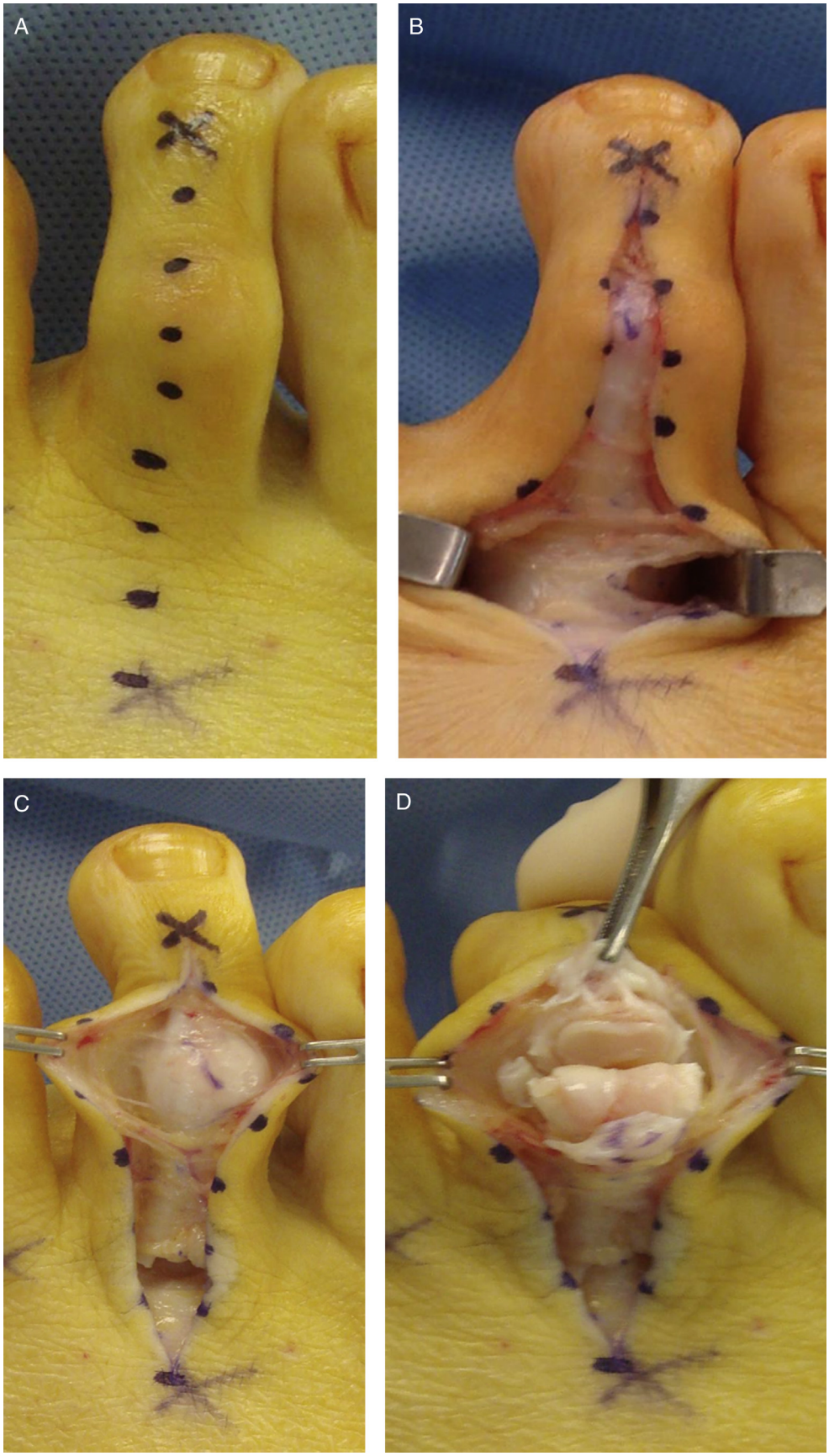

Fig. 1. Dissection technique. (*A*) A dorsal linear incision is made immediately proximal to the metatarsophalangeal joint and extending distally to the distal interphalangeal joint. (*B*) Capsulotomy at the metatarsophalangeal joint is commonly performed when transverse or sagittal plane contracture is present at that level. (*C*) Dissection is isolated to the metatarsophalangeal joint and proximal interphalangeal joint areas to avoid degloving of the proximal phalanx and undesirable swelling that can create a sausage digit appearance. (*D*) Bone is exposed at the proximal interphalangeal joint in typical fashion before the articular surface is resected with a sagittal saw. Care is taken to resect minimal bone adjacent to the articular surface when performing end-to-end arthrodesis.