Kompressor™ Screw System Fixation of Distal Interphalangeal (DIP) Joint Arthrodesis

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CLINICAL CASE

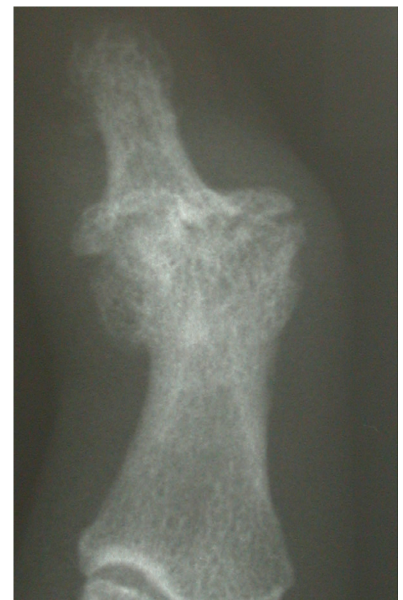
A 67 year old female with severe osteoarthritis affecting both hands underwent arthrodesis of the distal interphalangeal joint of her left index finger. (Fig. 1)

INTRODUCTION

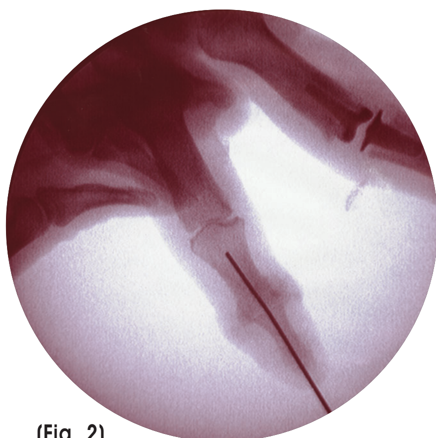
Compression screws have been used for the fixation of distal interphalangeal joints for some time. The Kompressor screw with its advanced technology and the ability to produce high levels of compression allows better fixation and the potential for early fusion. An additional advantage to the strong fixation is that early mobilization is possible without the need for a splint. Furthermore, the Kompressor system has all the advantages of a cannulated system with additional self-drilling and self-tapping features. Finally, compression of the arthrodesis can also be controlled by the surgeon.

SURGICAL TECHNIQUE

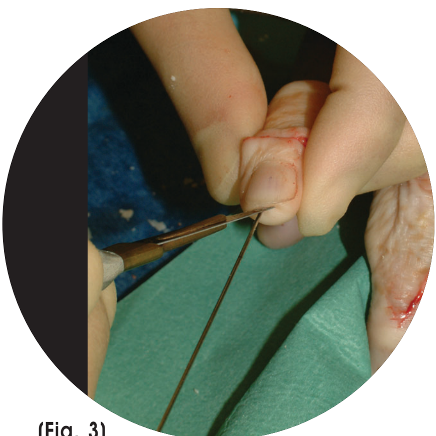
Under complete axilliary block anesthesia the patient was taken into the operating theatre, an upper arm tourniquet was applied and the limb prepped and draped in the usual manner. Under conditions of strict asepsis and following a dorsal incision, the extensor tendon was divided and the capsule of the distal interphalangeal joint incised transversely. At that time the clinical diagnosis of osteoarthritis was confirmed. The joint surfaces were removed using a combination of an oscillating saw and rongeurs. The phalanges were then reduced to achieve opposition of the prepared bone surfaces in neutral alignment in both the antero-posterior and lateral planes.



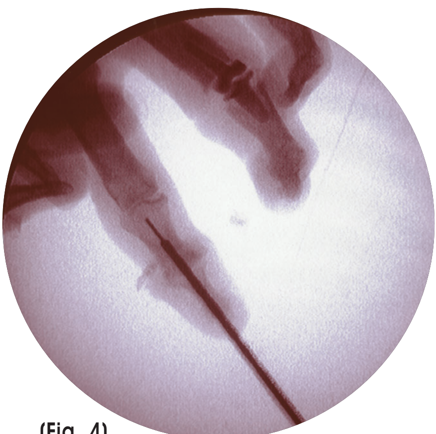
(Fig. 1)


(Fig. 2)

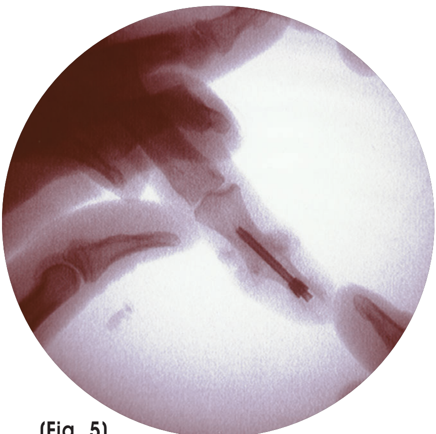
A K-wire was passed in a retrograde fashion from the distal interphalangeal joint through the distal phalanx and out through the pulp of the finger just below the nail. The wire was then advanced and the arthrodesis reduced. The wire was then passed along the middle phalanx to temporarily fix the reduction. The position of the arthrodesis was checked using a fluoroscopy unit. Ideally the K-wire should pass along the mid shaft of the distal and proximal phalanges in both the antero-posterior and lateral planes. **(Fig. 2)**


(Fig. 3)

A small skin incision was then made over the protruding K-wire. **(Fig. 3)** The required screw length can be determined using a depth gauge. The pathway of the screw was prepared using a 2.2 mm cannulated drill and under fluoroscopy both phalanges were drilled to the correct depth. **(Fig. 4)** Prior to drilling it is recommended that the K-wire needs to be further advanced so that it will not be removed when the drill is extracted. Using the larger 2.8 mm drill, the tip of the distal phalanx was also drilled under X-ray control.


(Fig. 4)

The correct size Mini Kompressor screw was then taken and attached to the appropriate placement driver. The screw was inserted in a cannulated fashion, again monitored by fluoroscopy. It is important that the trailing section of the screw is fully buried in bone and ideally the screw should lie parallel to the cortices of the distal and middle phalanx and perpendicular to the arthrodesis surfaces. **(Fig. 5)**


(Fig. 5)

Compression can be applied when the screw is sited correctly. In this patient, sufficient compression was applied, using the appropriate compression driver in a cannulated fashion, by advancing the trailing screw on the leading screw by half to one turn. During this process it is important to monitor the arthrodesed surfaces. The final position was checked by fluoroscopy.

Closure of the tendon and skin wounds were undertaken by fine sutures and a dressing applied. At this time a temporary splint was also applied purely for pain relief.

POST-OPERATIVE COURSE

Ten days after surgery the splint and sutures were removed. At that time, depending upon the degree of fixation and the patient, either the arthrodesis can be left free or supported by a small thermo plastic splint for four to five weeks. However, it is important that the patient is encouraged to regain full movement in the surrounding joints. In this case the arthrodesis was splinted but at six weeks the patient was encouraged to use the hand normally and at twelve weeks with X-ray evidence of union the patient was discharged from care.

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