



A Perspective on the Evolution of Distal Radius Fracture Treatment

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The treatment for distal radius fractures has changed significantly over time. Initially, distal radius fractures were treated as relatively innocuous injuries that befell the elderly and the comparatively inactive, and casts were the mainstay of treatment. However, closer scrutiny of the clinical results revealed a myriad of problems with these treatments, including “cast disease,” stiffness, inability to hold skeletal position, and soft-tissue compromise that affected the overall function of the wrist and hand.

Additional techniques to improve results included the “pins and plaster” technique, with the introduction of 2 pins in the radius and metacarpals to retard collapse of the fracture while in the cast. This was in some sense an early version of external fixation, with pins giving support to the unstable wrist and the body of the cast serving as the external support. There was further evolution of the adaptation of early versions of external fixation used for the lower extremity towards the treatment of the distal radius. For example, when I was a resident at Massachusetts General Hospital, we routinely applied femoral distractors as external fixation devices for selected distal radius fractures. This was a time when more specific anatomic devices and implants were not yet available.

External fixation evolved,¹ and distal radius-specific systems, with enhanced ability to adjust and achieve reduction, became available in the late 1980s. At the same time, distal radius fracture plating evolved from simple “stamped metal” plates with screws that merely fit in the screw holes, to more highly engineered implants with screws that engaged the plate at a fixed angle, much like the blade plate technology used for lower extremity fractures.² Over time, the volar fixed-angle plating system supplanted the other treatments and emerged as a popular treatment method.

Use of Kirschner wires or simple pins has been pro-

moted in the past for treatment of distal radius fractures. In France, Kapandji³ described the use of “intra-focal pinning.” In this technique, smooth Kirschner wires are introduced in the fracture site itself, and then using leverage so that the pins act like “crowbars,” the distal fragment that is malpositioned becomes adjusted into a more anatomic position.³ Kapandji’s treatment can be very effective in achieving reduction; however, as there is no fixation into the distal fragment, this technique has limitations in maintaining the reduction until healing has occurred. Interfragmentary pinning from the dorsal radial and dorsal ulnar aspects were nicely described by Clancey.⁴ I have found great utility in combining the Kapandji intra-focal

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techniques to achieve reduction with Clancey pin fixation or distal radius plating to maintain reduction.

I was intrigued with the article by Drs. Siegall and Ziran, “En Bloc Joystick Reduction of a Comminuted Intra-articular Distal Radius Fracture: A Technical Trick,” in this month’s issue of *The American Journal of Orthopedics*. In their technique, the authors introduced a series of parallel pins or screws below the articular surface from radius to ulna in parallel fashion to provide provisional fixation for the intra-articular components of their complex fracture. Once having done so, they felt more secure in manipulating the distal radius component en bloc; in fact, they used strapping to provide distal traction on the external protruding portion of the pins to help achieve and maintain reduction for their definitive fixation. Drs. Siegall and Ziran describe the use of either Kirschner wires or plating to provide definitive fixation. In the example cited, they performed (via

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Author’s Disclosure Statement: Dr. Diao wishes to report that he is a paid consultant to Stryker.

Am J Orthop. 2014;43(8):349-350. Copyright Frontline Medical Communications Inc. 2014. All rights reserved.

an open method) both the scaffolding and plating without the need of an assistant to hold or maintain the reduction during the osteosynthesis. I can envision adapting the technique they describe to percutaneous treatments for placement of the scaffolding pins, and even the Kapandji/Clancey pins under fluoroscopic guidance or arthroscope-assisted placement.

Despite the popularity and utility of volar fixed-angle plating techniques to treat distal radius fractures, there remain certain situations in which these techniques are faced with challenges. Certainly one of them is the more complex intra-articular fracture with multiple components, or in the very distal fracture patterns in which there is limited bone for the surgeon to use in providing distal screw fixation in the plating systems. Additionally, the nascent malunion presents some challenges as well in terms of performing a “takedown” of the partially healed fracture without destroying the soft, partially healed distal bone that contains the all-important articular component. These are the instances where supplemental techniques such as the one described by Drs. Siegall and Ziran, as well as the Kapandji and Clancey techniques, have their greatest utility and appeal. Despite one’s wishes and best efforts, some dis-

tal radius fractures are not easily reconstructable. In these cases, use of external fixation or temporary arthrodesis dorsal plating with subsequent plate removal^{5,6} can be the best reconstructive option and a great “bailout.” The prepared surgeon should have these supplemental techniques in their armamentarium to be able to adapt to the conditions that present themselves in the operating room and to do the best job they can for the patient.

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