Technical Note

Arthroscopic-Assisted Distal Radius Fracture Fixation Using the NanoScope System

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Abstract: Intra-articular distal radius fractures with significant articular step-off and gapping are associated with high risk of developing symptomatic arthritis and poor functional outcome. The use of arthroscopy for distal radius fixation had been well published in the literature. It allows the surgeon to fine-tune intra-articular fragments to achieve articular congruency, address ligamentous disruption, and check for screw penetration within the joint. Various techniques have been reported, including volar locking plate presetting to aid in arthroscopic reduction. Here, we demonstrate our arthroscopic-assisted distal radius fixation technique using a 1.9-mm miniature scope NanoScope (Arthrex, Naples, FL).

In the last 20 years, arthroscopy has become increasingly popular for intra-articular distal radius fracture (DRF) fixation.[1,2] Knirk and Jupiter[3] found that patients with intra-articular DRF with an articular step-off of more than 2 mm had an increased risk of developing arthritis, 93% of whom were symptomatic. Later studies have shown that the articular threshold has been reduced to 1 mm.[4,5] Although conventional fluoroscopic-assisted DRF fixation can effectively restore radial height, inclination, and volar tilt, the extent of articular step and gap deformity often is underestimated.[2,6,7]

On the basis of a study comparing arthroscopic-assisted distal radius fixation (AADRF) and fluoroscopic-assisted DRF fixation, arthroscopy improves postoperative step-off and enables a more comprehensive assessment of associated soft-tissue injuries.[8] In the acute setting, arthroscopy can aid in the removal of intra-articular hematomas and detect fragments that compromise the reduction of intra-articular fragments.[9,10] Intra-articular screw penetration also can be assessed using the arthroscope during the fixation.[10-12] Moreover, the severity of the intra-articular step is directly correlated with the degree of postoperative intra-articular fibrous tissue formation, ultimately resulting in restricted wrist movement.[13] Koo et al.[14] found statistical improvements in functional outcomes (range of motion, grip strength, Mayo wrist score, and Disabilities of the Arm, Shoulder, and Hand, short version, score) as well as articular steps and gaps in AADRF compared with fluoroscopic-assisted DRF. Here, we demonstrate a surgical technique for AADRF using the NanoScope (Arthrex, Naples, FL) system in a left intra-articular distal radius fracture (AO type C3; Video 1).

Surgical Technique

Preoperative Planning

Radiographs of the injured wrists and computed tomography scans are helpful to delineate the different fracture fragments and orientation. A 3-dimensional computed tomography scan with carpal subtraction allows us to better appreciate the die-punch fragments of the radiocarpal articulation from an axial perspective (Fig 1). Surgery should be performed within the first week of injury, as organized hematoma can impede fracture reduction. If the surgery occurs 3 weeks or

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