

RAYHACK® Radial Malunion Distraction System

Caveats

As described by John M. Rayhack, MD | Tampa, FL



- The radius must permit the placement of the 2.5mm drill bits placed through the multi-angled drill guide (which is attached to the drill guide base) to be 1cm proximal to the radial-lunate joint surface. If the radius has not healed and the fracture is too distal, it may not be possible to use this instrumentation. Choose the first area of the metaphysis where there will be firm fixation with the 2.5mm drill bits placed through the multi-angled drill guide. The holes chosen will be based on the degree of articular correction needed (determined by pre-operative xrays).
- Rotational deformities can be corrected by setting the multi-angled drill guide swivel at a fixed degree of rotation from zero to fifteen degrees. For most radial malunion osteotomies, the drill guide will be set at zero degrees of rotation. To assess the degree of rotational malalignment the surgeon is directed to: Binda, Cole *et al.* "Quantification of the Radial Torsion Angle with Computerized Tomography in Cadaver Specimens" *JBJS* 79-A, June, 1977 833-837.
- Radial translation of the distal radius relative to the shaft often occurs in distal radial malunions. This deformity can be corrected by shifting the five prongs of the multi-angled drill guide relative to the five holes in the drill guide base. The amount of shift is determined by placing the two screw holes of the drill guide base over the middle of the radial shaft; while the two 2.5mm drill bits contact the radial metaphysis in a location to permit firm bone fixation.
- The .062" K-wire is useful for temporary fixation of the saw guide, to determine the amount of diaphysis that requires trimming, and for orientation of the distal fragment during placement of the distractor.
- Surgeons may elect to osteotomize the radius through the perpendicular slot (0 degrees), even if the radial articular surface is displaced 20 or 30 degrees dorsally. This attempts to minimize shaving of the dorsal metaphyseal "spike" in order to permit the plate to be placed flush with the dorsal radius. If a vertical osteotomy is performed, consider a freehand vertical cut of the volar distal radial spike parallel to the articular surface. This will create two vertical surfaces against which the bone graft can be opposed.

- After some distraction has occurred, screw "A" prevents the radius from pulling away volarly from the distractor and the dorsal plate.
- During distraction gently and evenly distract all three screws. Avoid excessive torque and stop when excessive resistance is appreciated. A concurrent ulnar shortening can substitute for an excessive radial distraction. Concurrent shortening has been described in the literature by Kambouroglou and Axelrod, "Complications of the AO/ASIF Titanium Distal Radius Plate System in Internal Fixation of the Distal Radius: A Brief Report". *J. Hand Surg.* 23A:739.
- Gently release the tension on the distracting screws before trying to remove the screws that fix the radial distractor. Failure to do this may result in stripping of the 2.5mm screw.
- The bone graft must keep the distal volar radial surfaces from collapsing towards the radial shaft. Excessive volar tilt with loss of fixation results in an unsightly clinical dorsal concavity and a malaligned radial-carpal angle on the lateral radiograph.
- During closure, the dorsal plate will remain partly uncovered by soft tissues. The straight alignment of the tendons over the straight plate should decrease the incidence of tendon irritation during the post-operative period. Immobilize the thumb for one month to allow protection and healing of the extensor pollicis longus muscle belly and tendon.
- The patient must be protected until healing has occurred; no activity against resistance is permitted until radiographic healing is confirmed.

Prior to use of the system, the surgeon should refer to the product package insert and surgical technique for complete warnings, precautions, indications, contraindications and adverse effects.



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