

# Intra Focal K-Wiring for Distal End Radius (Kapandji Technique): Surgical Technique

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## Introduction

Many years distal end radius fractures (DRF) are the most encountered type of fracture.

In standard form, extra articular distal end radius fractures were fixed after manual reduction and then pinned extra-articular by drilling distal cortex and passing fracture site to fix proximal fragment (Figure 1). But after 2 to 3 weeks depending upon osteoporosis fracture collapse (cancellous bone heal by collapse) and flexibility of K wire distal fragment moves back until the K wire about the inferior edge of the proximal fragment and not avoids secondary displacement (Figure 2)[1].

## Principle of Intrafocal Pinning (Figure 3)

In Kapandji intrafocal pinning, K wire is passed directly into the fracture line. In this way, secondary displacement is made impossible by the immediate contact of the distal fragment. Now this K wire is working as an abutment and acts as buttress on the distal fragment. The volume of K wire inserted in the fracture site prevents the collapse.

## Indications:

1. Frykman type 1, 2, 5 and 6.

## Contraindication:

1. Frykman type 3, 4, 7 and 8.

## Technique

Under regional or WALANT anesthesia, the limb was placed on a radiolucent side table under control of image intensifier. No need of tourniquet.

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## Material Required

1. 2 mm K-wires (trocar tip)
2. Power drill
3. Good k wire cutter
4. Small artery forceps
5. Suture

## Steps: (Video)

Video Link:

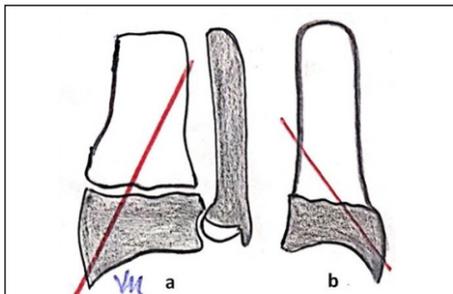
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1. Always correction of radial displacement first. Take small incision on radial surface of radius at fracture site by keeping hand in lateral position with folded towel under the wrist. Subcutaneous dissection longitudinally along the surface of the radial border and protect the superficial radial nerve. Once fracture site is open insert 2 mm trocar tip K wire freehand horizontal (90 degree) to fracture site till one cortex then change the direction of K-wire from 90 degree to 45 degree caudally. This maneuver corrects the radial tilt and radial displacement which is confirm on C arm in AP and Lateral view. Once it is confirm keeping wrist in lateral position and maintain 45 degree angle the k wire is driven into opposite cortex. Care should be taken to avoid a medial translation. The position of K-wire is confirmed on both views under C arm (Figure 4).
2. Take two small incision on the posterior radial and posterior ulnar surface of the radius. Second 2 mm wire is passed vertically free hand and maintaining 45 degree angle wire is engaged to far cortex after separating extensor tendon. Second wire correct dorsal tilt and displacement of the posterior radial fragment. Last K wire is passed from posterior ulnar surface to correct ulnar fragment. Both wires should avoid anterior translation (Figure 5).
3. After confirmation of fixation cut all the K-wire flush to the bone and buried under the skin by single suture. This will prevent infection of pin tract and loosening of K-wires.

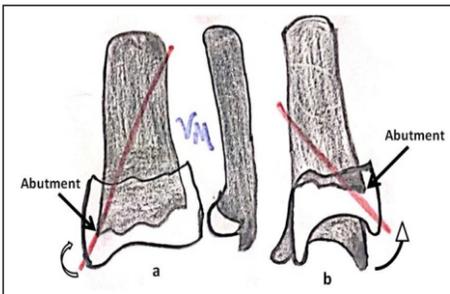
Submitted: 14/6/2020; Reviewed: 21/7/2021; Accepted: 24/7/2021; Published: 10/8/ 2021

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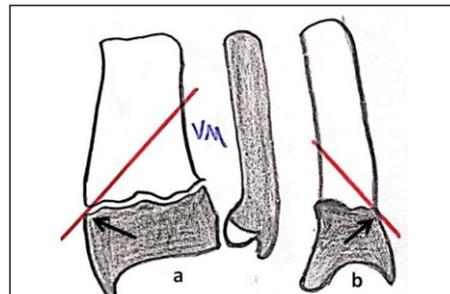
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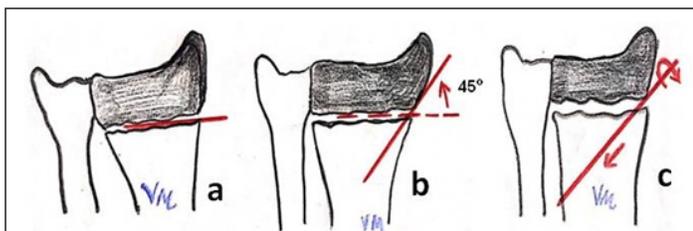
**Figure 1:** Extra-articular pinning of a distal radius fracture. K wire inserted in the distal part is located far away from the edge of the proximal part. a) Front view; b) Side view.



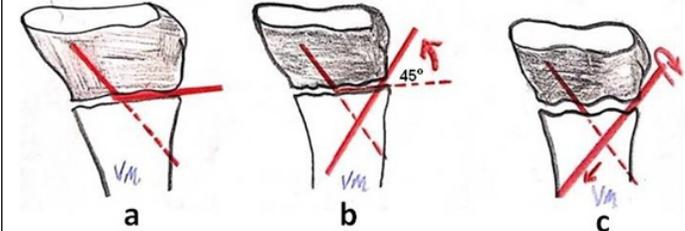
**Figure 2:** Collapse after extra-articular pinning. The k wire bends until it is stopped by the edge of the proximal part, which forms an impassable barrier. a) Front view; b) Side view.



**Figure 3:** The K wire set in the fracture site, makes an immediate abutment (buttress), preventing secondary collapse and displacement of the distal fragment. a) Front view; b) Side view.



**Figure 4:** Frontal view of correction of radial displacement. a) Wire is passed in 90 degree to radial shaft through fracture site till half of the bone. b) Manipulation of the wire from 90 to 45 degree allows correction of radial displacement and radial inclination. c) Wire is engaged to opposite cortex. Care should be taken to avoid medial translation of the distal fragment.



**Figure 5:** Sagittal view of correction of dorsal displacement. a) Wire is passed vertical in 90 degree through fracture site of dorsal surface. b) Manipulation of the wire allows correction of dorsal displacement and tilt and also dorsal angulation. c) Wire is engaged to opposite volar cortex. Care should be taken to avoid volar translation of the distal fragment.

**Post Operative**

The wrist is immobilized in volar cock up slab for 4 weeks. After 4 weeks, remove the slab and after fracture consolidation start active mobilization of wrist for one week. K-wire removal done

under local after 5 weeks and start physiotherapy session with night splint application.

**References**

1. AI Kapandji: Treatment by intrafocal pinning with arum pins. In: Philippe Safar, William P Cooney III, editors. Fracture of the distal radius.

Philadelphia: JB Lippincott, 1995.p.72-73.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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