

IS EXTERNAL FIXATION USEFUL FOR DISTAL RADIUS FRACTURES?

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DISTAL RADIUS FIXATION

Closed reduction and percutaneous pinning
External fixation (Bridging and non-bridging)
Internal fixation

- Volar plates
- Dorsal plates
- Fragment specific fixation
- Spanning plates



SURGICAL INDICATIONS

- Radial inclination < 12-15°
- Dorsal tilt > 10°
- Radial shortening > 2-3 mm
- Articular displacement over 1 mm
- Rough guidelines only

GOALS OF TREATMENT

- ▶ Restore articular congruity (RC and DRUJ)-prevent DJD
- ▶ Restore radial length- prevent impaction
- ▶ Restore articular tilt to neutral or volar- prevent painful carpal instability
- ▶ Restore radial inclination- prevent cosmetic deformity

ARTICULAR DISPLACEMENT

- ▶ Well established correlation between articular displacement and arthritic changes
- ▶ Luckily, these changes are not necessarily painful
- ▶ Even at 15 yr follow-up

Catalano et al, JBJS, 1997
Goldfarb et al, JHS, 2006

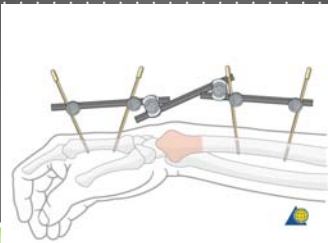
VOLAR PLATES VERSUS EXTERNAL FIXATION

- ▶ Bridging external fixation
 - ▶ Less demanding surgery
 - ▶ Less invasive
 - ▶ Quicker surgery time
- ▶ Volar plate fixation
 - ▶ Immediate stable fixation
 - ▶ Early mobilization
 - ▶ More rapid recovery and function

INDICATIONS FOR EXTERNAL FIXATION OF THE DISTAL RADIUS

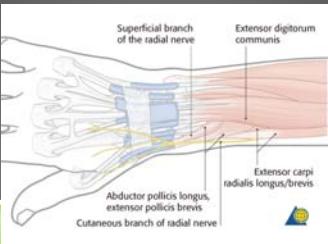
- ▶ Highly comminuted
- ▶ Severe soft tissue injury
- ▶ Polytrauma
- ▶ Infection

APPLICATION OF EXTERNAL FIXATION FOR DISTAL RADIUS FRACTURES

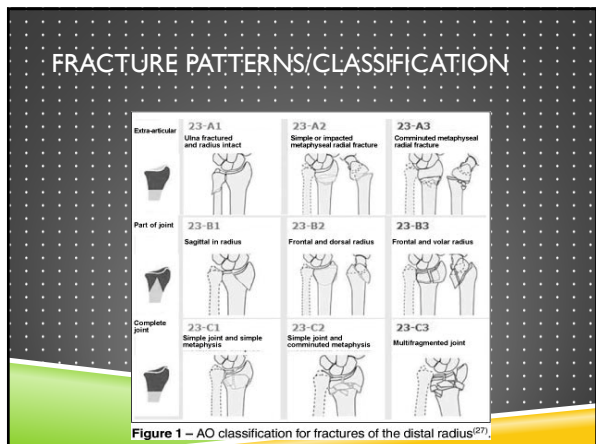


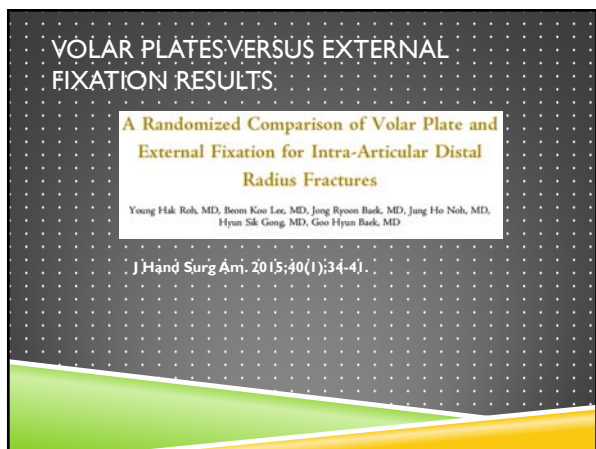
The diagram shows a lateral view of a hand and forearm. A distal radius fracture is indicated by a red area. An external fixator is applied, consisting of a horizontal bar connected to four vertical pins inserted into the bone. The hand is in a flexed position.

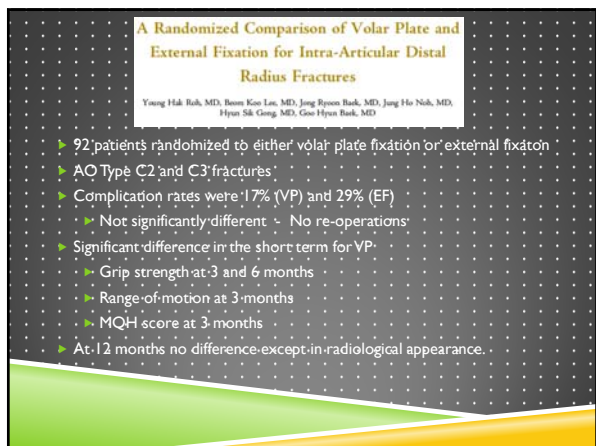
APPLICATION OF EXTERNAL FIXATION FOR DISTAL RADIUS FRACTURES



The diagram shows a lateral view of the hand and forearm with anatomical labels. The labels include: Superficial branch of the radial nerve, Extensor digitorum communis, Extensor carpi radialis longus/brevis, Abductor pollicis longus, extensor pollicis brevis, and Cutaneous branch of radial nerve.







External Fixation and Adjuvant Pins Versus Volar Locking Plate Fixation in Unstable Distal Radius Fractures: A Randomized, Controlled Study With a 5-Year Follow-Up

John H. Willkens, MD,* Torstein Husby, MD, PhD,† Johan C. Hellund, MD, PhD,‡ Hebe D. Kvernmo, MD, PhD,§ Carina Rosales, BSc,¶ Frede Frihagen, MD, PhD*

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- ▶ 114 Patients enrolled, 91 at follow up, Type A and C fractures
- ▶ No difference in Mayo wrist score, VAS, and quickDASH at 5 years
- ▶ VP had significantly better supination and radial deviation
- ▶ VP had significantly better ulnar variance
- ▶ Subgroup C2 fractures had significantly better Mayo wrist score, flexion, supination, grip strength
- ▶ Same radiographic arthritic changes in the 2 groups at 5 years
- ▶ 16 secondary surgeries in VP group (31%) of which 11 were plate removal vs 10 secondary surgeries in EF group (17%)

COMPLICATIONS FROM EXTERNAL FIXATION

- ▶ External fixation
 - ▶ Stiffness
 - ▶ CRPS
 - ▶ Pin site infection
 - ▶ Metacarpal fracture
 - ▶ Superficial radial nerve injury
 - ▶ Nonunion
 - ▶ Malunion

COMPLICATIONS FROM EXTERNAL FIXATION – METACARPAL FRACTURE



An X-ray image of a hand showing an external fixator (a frame of pins and bars) applied to a metacarpal fracture. The hand is positioned palm up, and the fixator is clearly visible over the dorsal aspect of the hand.

COMPLICATIONS FROM EXTERNAL FIXATION – NONUNION/LOSS OF REDUCTION




Four X-ray images of a forearm with an external fixator. The first image shows a normal fixation. The second image shows a nonunion of the radius. The third image shows a loss of reduction of the radius. The fourth image shows a loss of reduction of the ulna. Each image has a 'R' and 'C' marker for orientation.


COMPLICATIONS FROM VOLAR PLATING

- ▶ Nerve injury-- Median or palmar cutaneous nerve branch
- ▶ Intra-articular hardware
- ▶ Extensor tendon ruptures from prominent screws.
- ▶ Flexor tendon ruptures from the rim of the volar plate.
- ▶ Loss of reduction.

ANOTHER OPTION: DISTRACTION SPANNING PLATES

Distraction Plating for the Treatment of Highly Comminuted Distal Radius Fractures in Elderly Patients. Marc Richard, MD, et al. JHS May 2012





CONCLUSIONS

- ▶ Volar plating has significantly improved short term outcomes
- ▶ Generally by one year, external fixation has similar functional outcomes
- ▶ Volar plating has improved radiographic outcomes.
 - We are not sure if that will translate to better outcomes in the very long term
- ▶ As with any surgery, there are complications that can arise based on the procedure chosen.

IS EXTERNAL FIXATION STILL USEFUL?

YES

Would I choose it for myself?

Not a chance. I would take the short term functional improvements and earlier mobilization.
