

# Advice From a Hand Surgeon on Wrist Fractures

No one knows better than a surgeon who specializes in hand surgery the difficulties of repairing some wrist fractures. In this article, distal radial fractures are the focus. In particular, the surgical treatment of comminuted distal radial fractures is discussed and demonstrated.

The radius is one of the two bones in the forearm. Distal radius refers to the end closest to the wrist (rather than the top of the bone closest to the elbow). Comminuted tells us the bone is broken into many tiny pieces.

When trauma causes the radial bone to fracture, split and explode apart, the hand surgeon is faced with some complex challenges. For example, how do you separate the broken pieces when they are jammed together and then realign all the fragments?

Traction is often used (suspending the forearm in a vertical position) to pull the bones apart. It may sound simple to say the surgeon suspends the patient's forearm in a vertical traction unit and in reality, it only takes about five minutes. But the process is a bit more complicated than can be explained in words. So a series of photos and description are provided complete with some of the surgeon's own clever adaptations of carabiners (metal clips used by rock climbers to hold things). Keeping everything sterile at all times is also discussed.

And just try operating on a hand suspended in mid-air. The position is awkward for the surgeon. To help other surgeons navigate this tricky surgery, the case of one patient with a comminuted articular distal radial fracture is presented. Articular fractures affect the bone where it meets to join the joint surface.

A complete description of the procedure and even a video are available with this article. The use of dry versus wet arthroscopy and combination of vertical traction and hand lying on the surgical table are presented. Dry arthroscopy refers to completing the surgery without using saline solution or other fluids to flush out the area being operated on.

Wet arthroscopy relies on the use of fluid flushing as part of the procedure. Fluid inside the joint helps keep the area open and easier to work inside. The author advocates using a combination approach of dry and wet to keep a clear view of the joint while at the same time removing debris and blood. Specific tips are given to help the surgeon know how to do this using the benefits of both irrigation and suction.

The surgeon provides photos taken inside the wrist during the procedure to demonstrate repair of bone fragments, especially when the interface of cartilage and bone at the wrist joint are affected. The difficulties of drilling holes in the bone fragments for nails or screws that are used to hold everything together is discussed. This part of the procedure can drive the bones apart again. X-rays, MRIs, and photographs taken before, during and after the procedure can help. Examples of each are included for this case.

The surgeon (author) provides what he calls pearls and pitfalls. Here are a few examples:

- When unstable bone fragments sink down into the joint, it is possible to create a hammock to support them. The hammock is formed using a metal plate and locking pegs into the plate under the bone.
- A special surgical tool called a grasper can be used to reach in and grab and twist fragments that have shifted and twisted in the process.

- Sometimes it just isn't possible to reduce (put back together and realign) all the broken pieces at once. The surgeon must piece everything back together one fragment at a time. Figuring out which fragment to begin with and the order to proceed with can be very challenging. The best approach isn't always clear. The process then becomes one of trial-and-error.
- It may be necessary to improvise by using surgical instruments not ordinarily intended for wrist surgery. In one illustration, the surgeon shows how to use a knee probe to hook under a bone fragment in the wrist and pull it up out of the hole created by broken, shifted bone fragments. Once it is lined back up where it belongs, screws or wires can be used to hold it in its proper (anatomic) place.
- Ask for help from another hand surgeon. This is often essential with the more complex fractures.
- He summarizes by saying the operation described to repair a comminuted distal radial wrist fracture in this article consists of four steps. First, the surgeon uses fluoroscopic (real-time) X-rays to guide him in order to temporarily place the articular pieces together. A special locking plate and wires will do the trick to hold the fracture together. Later the wires will be backed out and more secure, permanent fixation replaces the wires.

Second, the surgeon must take the time to fine-tune the reduction by lining each fragment up one at a time. Third, now is the time to go back and firmly attach everything together. And finally, the surgeon takes a look inside the joint for any other soft tissue damage that needs to be repaired.

The author encourages hand surgeons to perform as many wrist fracture fixation procedures (simple and complex) possible arthroscopically. By doing so with the simple surgeries, the more complex become a matter of completing several simple steps one at a time toward the final goal of restoring anatomy, alignment, and function.

Reference: Francisco del Piñal, MD, DrMed. Technical Tips for (Dry) Arthroscopic Reduction and Internal Fixation of Distal Radius Fractures. In *The Journal of Hand Surgery*. October 2011. Vol. 36A. No. 10. pp. 1694-1705.