Pearls and pitfalls: Fractures of the distal radius

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Dealing successfully with difficult fractures

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Radius fractures are among the most common and most commonly treated fractures. Although Abraham Coles stated that after a radius fracture, full freedom of movement and function are restored—and that statement may be true for fractures in the very young or very old—fractures in the younger adult population can certainly be problematic.

Distal radius fractures are often the result of high-energy impacts and falls and can be difficult to treat. This article outlines a way for orthopaedic surgeons to deal successfully with difficult fractures of the distal radius (Fig. 1A, 1B).

High-energy impact to the distal radius creates injuries potentially fraught with peril for both the patient and the surgeon. Complications can include, but are not limited to, the following: neurologic compromise, stiffness, infection, arthritis, malunion, nonunion, and pain. With careful attention to the initial presentation, the pattern of injury, and a few details during treatment, the orthopaedic surgeon can create a healing environment that gives the patient the best chance for a successful outcome and avoid many potential complications.

The goals of treatment have always been to restore the anatomy of the radius—length, tilt, inclination, and joint surface. Newer techniques and devices make that goal more attainable than ever before. Nevertheless, no one technique is always best, and a return to normal may not be possible, regardless of treatment.

Look beyond the wrist

Comprehensive initial evaluation of the patient who has sustained a radius fracture is vital to successful treatment. Not only is the mechanism of injury important, but the patient’s medical and social history also can affect treatment decisions. A careful physical examination is important as well; the initial evaluator should not be so focused on the injury itself is needed. The surgeon must consider the degree of injury to the radius—including displacement, comminution, and articular involvement—along with other injuries to the wrist as treatment commences.

Choosing fixation

Closed reduction should not be used for high-impact distal radial fractures; cast treatment alone is inadequate to treat the significant instability and deformity in these fractures. External fixation, external fixation with pinning, pins alone, and volar plating are the most popular treatment options, with volar locking plates being the most comminuted fractures that demonstrate instability.

Indications for volar locking plate fixation

Most comminuted fractures of the distal radius can be managed with volar locking plates. Due to the architecture of the plates, even severely comminuted, intra-articular fractures can be managed using this method (Fig. 2). The locked distal screws can be used to support and stabilize distal comminuted fragments. The locked proximal portion creates a stable three-dimensional construct. These devices can also be used with less comminuted fractures that demonstrate instability.

Surgical approach and technique

Once the surgeon determines that volar fixation will be used and assesses other issues surrounding the injury, he or she can begin surgical treatment. The following seven steps will help ensure successful treatment:

• Determine whether carpal tunnel release (CTR) is indicated. The decision can be based on the patient’s history and physical exam. If the radial three-and-a-half digits have numbness or significant paresthesias, CTR should be considered. If CTR is necessary, a second incision in the palm, essentially in line with the ring ray, can be made. Avoid injury to the palmar cutaneous branch of the median nerve that courses radial to the palmaris longus. (Connecting the incisions without isolating this tiny nerve can often result in injury to the nerve.)

• Prepare and drape the patient appropriately. Many patients with distal radial fractures have been in splints for extended periods. Be certain that the skin is appropriately cleansed prior to the formal prep and that preoperative antibiotics are administered. Some of these fractures will be open, if only minimally. Check for allergies before giving antibiotics. Usually a first-generation cephalosporin is appropriate. Use a radiolucent hand table and tourniquet on the arm.

• Use image intensification to assess reduction and fixation. Small fluoroscopy units are an extremely useful adjunct in radius fixation and can be used to assist in fracture reduction.