TECHNIQUE

Fragment-Specific Fixation of Distal Radius Fractures Using the Trimed Device

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ABSTRACT

Fragment-specific fixation of the distal radius represents a new technique for addressing complex distal radius fractures. It signifies a substantial shift in the thought process of open reduction and internal fixation; each fracture fragment is addressed independently with small plates or wire forms, allowing comminuted fractures to be anatomically restored and early motion started. Although the system is at first daunting, its modularity provides flexibility for the surgeon to modify the fixation to the individual needs of the patient's specific fracture pattern and the surgeon's level of expertise. Once the technique has been learned, the surgeon will have in his or her armamentarium a powerful new tool to treat fractures that had before been difficult to address satisfactorily with conventional techniques.

Keywords: fragment specific, wire forms, distal radius, modularity, comminuted

HISTORICAL PERSPECTIVE/ OVERVIEW

Introduction of the Trimed Fracture Fixation System in 1996 represented a novel approach in the fixation of complex distal radius fractures. Previously, open reduction and internal fixation had applied a single "one size fits all" plate to the dorsum or volar surface of the distal radius and then attempted to secure the multitude of fracture fragments to the plate as well as could be accomplished. Although this approach is certainly still valid in those fractures with a small number of sizable fragments that can be secured to the plate with distal screws, for the complex fracture with marked comminution and/or osteopenia that prevented distal screw purchase, it has not been entirely successful.

Several revolutionary ideas were introduced through the Trimed system to address these problematic injuries. An array of low-profile plates and wire forms is used that can address each of the major fracture fragments. The system also uses plate-supported 0.045 pins, sharp tines on the wire forms, or buttress wire forms to engage the distal fragments of bone where screw fixation is suboptimal or impossible. Placing the hardware in an orthogonal configuration permits rigid fixation to be obtained, allowing early motion in the majority of these patients.[1,2]

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Approach

The patient is placed supine, and a hand table is used. General anesthesia or axillary block that allows muscle relaxation is helpful in reduction, particularly in muscular individuals or longstanding fractures. An assistant or end table traction is useful but not necessary to aid in gaining and holding reduction during parts of the procedure. A mini-C-arm is essential during the procedure and will be used often enough that if it is not readily available we do not recommend proceeding with this device.

A modified Henry volar 6-cm incision is made proximal to the distal volar wrist crease.[3] The dissection continues along the lateral border of the radial artery between the radial artery and brachioradialis and the volar aspect of the 1st dorsal compartment tendons. The interval between the pronator quadratus insertion onto the radius and the volar retinacular attachment of the 1st dorsal compartment is sharply incised (Fig. 1). This allows subperiosteal elevation of the pronator quadratus and the 1st dorsal compartment tendons for exposure of the volar radius and the radial column, respectively. Elevating

The authors did not receive grants or outside funding in support of their research or preparation of this manuscript. They did not receive payments or other benefits or a commitment or agreement to provide such benefits from a commercial entity. No commercial entity paid or directed, or agreed to pay or direct, any benefits to any research fund, foundation, educational institution, or other charitable or nonprofit organization with which the authors are affiliated or associated. Neither of the authors or any of their families have any ownership in the TriMed Corporation or any of its affiliate companies.

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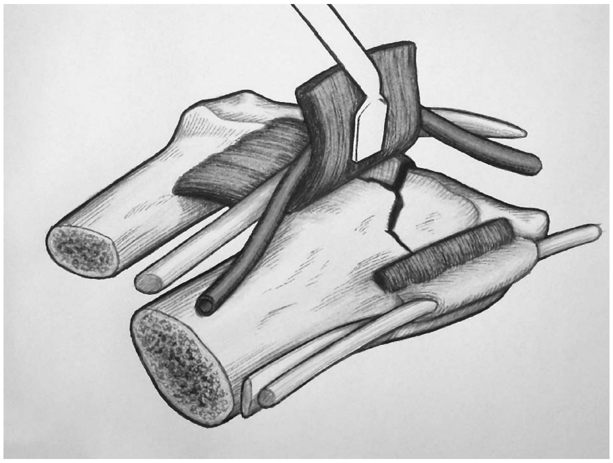

FIGURE 1. Line drawing depicting volar approach to the radius. The pronator quadratus is subperiosteally elevated, reflecting the radial artery and FCR out of harm's way. The 1st dorsal compartment can be elevated next to allow exposure to the radial column of bone for application of the radial pin plate.

the 1st dorsal compartment exposes the anticipated location of the radial pin plate at the radial tuberosity. Despite careful subperiosteal dissection, the floor of the 1st dorsal compartment may be violated. This will not affect tendon gliding or cause subluxation of these tendons. The most distal aspect of the tuberosity should be visualized. A narrow Homan retractor can be placed along the lateral edge of the radius to facilitate this part of the exposure. The brachioradialis can be elevated off the radius if it is a significant deforming force.

A standard 3rd dorsal compartment splitting approach is performed, exposing more of the metadiaphysis than the carpus.[4] The EPL is identified and retracted. The dorsal radius is exposed by subperiosteal elevation of the 2nd through 4th compartments. Care must be exercised in the subperiosteal elevation because the dorsal fracture fragments are frequently bound to the undersurface of the retinaculum and need to be dissected free. The posterior interosseous nerve (PIN) can be neurectomized at this time if desired. Through these 2 approaches approximately 270 degrees of the distal radius is exposed for inspection and reduction of the fracture as well as the eventual application of the orthogonal fixation.

Volar Fracture Fixation

Only after both of these approaches have been completed should fracture assessment commence, and our preference is to begin from the volar portion of the radius. The subperiosteal elevation of the pronator muscle is held in place by a Bennett retractor. Frequently there is an unappreciated rotational component of the fracture. The ulnar portion of the distal fracture fragment is displaced dorsally, leading to pronation of the hand on the forearm. This can be corrected by careful elevation of the distal fragment with a Freer elevator.

If there is excessive fragmentation volarly and/or poor bone stock, application of a volar buttress plate will prevent volar translation of the fracture late in the case.

In most instances gentle finger manipulation with end-of-table traction is all that is required to gain volar apposition of the fracture fragments. If the volar reduction seems to be anatomic, the first 0.045 K-wire should be driven across the fracture site. The K-wire is inserted at the most distal portion of the radial tuberosity. Exposure is facilitated by the use of either a small retractor or a tissue protector at the most distal dorsal corner of the incision. Drill the K-wire in the coronal plane of the radius to allow it to engage the proximal cortex. Confirm the fracture reduction and the K-wire position with a mini-C-arm. Frequently the K-wire is more proximal to the radial styloid than suspected. If the reduction is satisfactory and the pin has good purchase, the initial K-wire does not usually need to be reinserted. This K-wire may be secured to the radial pin plate later in the case or may serve only as a provisional fixation that is removed. It is important, however, not to secure the pin to the radial pin plate at this juncture because this will lock the fracture in place and prevent further reduction from the dorsum in an effort to regain volar tilt of the articular surface.

Volar Wire Form

The volar wire form is designed to address a displaced volar ulnar fragment. These bony fragments should be reduced and stabilized before proceeding with the dorsal fixation. This fragment can often be visualized through the modified Henry volar approach or though a second incision ulnar to the median nerve.

The fragment is reduced with manual manipulation and held with a provisional small K-wire. The volar wire form is prebent to follow the contour of the volar ulnar cortex. Its 2 legs need to be inserted into the volar lip of the volar ulnar fragment in such a way that when the wire form is impacted, the proximal loop will rest on the volar ulnar cortex of the radius. The volar wire form is inserted by first drilling 2 holes into the volar lip approximately 5 to 7 mm apart. The 2 holes are for the legs of the implant. An imaginary line connecting the 2 drill holes should be roughly perpendicular to the long axis of the radius (Fig. 2). The holes should be drilled approximately 20 degrees from the perpendicular to avoid penetration of the concave articular surface. The legs of the wire form are then trimmed; 1 leg is cut shorter than the other to facilitate impaction. The longer leg is then inserted into the appropriate drill hole and impacted until the second leg is touching the volar cortex. The second leg is then manipulated until it too is in its

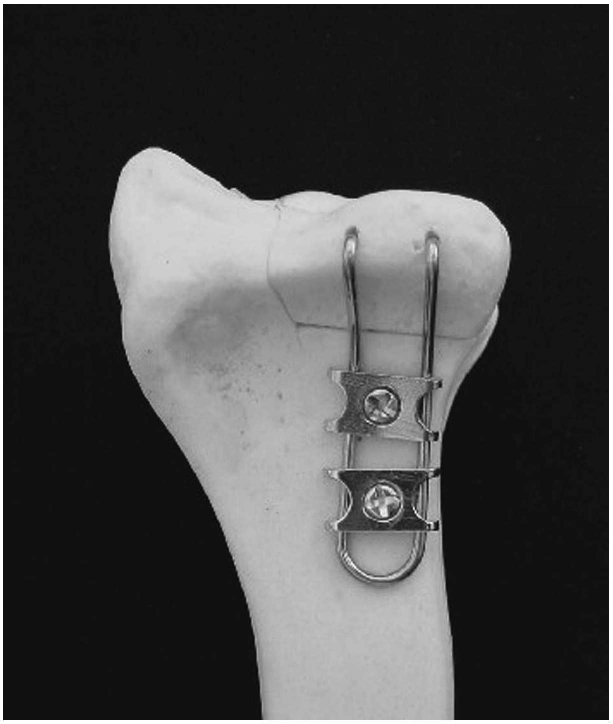

FIGURE 2. The appearance of the volar pin plate on a saw bones with screws and washers in place.

respective hole. By alternating impaction the proximal loop of the volar wire form will now rest on the volar ulnar cortex. If the proximal loop is angled ulnarly, then the drill holes were not placed perpendicular to the long axis of the radius, and the wire form may need to be withdrawn and 1 of the drill holes repositioned. Once the volar wire form is resting on the volar cortex, it should be secured with 2 separate screw-and-washer combinations.

Dorsal Fracture Fixation

The configuration of the dorsal radial metaphyseal surface is akin to the underside of a boat hull, rising to its maximum height between the 2 facet surfaces just ulnar to the Lister tubercle. This affords 2 distinct surfaces for fracture reduction and application of fixation hardware. Frequently one will encounter 2 or more large dorsal fracture fragments. These fragments represent the supporting dorsal cortical surface proximal to the scaphoid and lunate facet respectively. One difference between the Trimed system and other plating systems is that one must regain near perfect reduction before applying the fixation devices because the components are small and cannot be relied on to provide significant fracture fragment reduction. By utilizing end-table traction, gentle fracture manipulation, and flexion of the wrist over several rolled towels, one can maneuver the ulnarmost fragment into position.

Gentle elevation of the dorsal cortical bony fragments will allow visualization of the metaphysis of the radius and the undersurface of the subchondral joint. Frequently there is extensive bone loss noted, and we have found it valuable to pack bone graft beneath the subchondral surface to both aid in reduction of the joint surface and support the fracture while it heals. Bone graft material is fitted under each facet separately as the reduction and fixation of each proceed. Care must be taken not to allow bone graft to enter into the joint through any fracture lines that may extend distally. One can now replace the dorsal metaphyseal plate of bone over the graft site. The cortical plate of bone should lock into anatomic position at the proximal and distal fracture margins. If it does not, then it may mean that the distal fracture margin is not fully out to length. This shortening of the fracture alignment represents dorsal tilt of the joint surface. Further traction and augmenting the bone graft may be necessary to obtain correct length, which is verified by the anatomic fit of the dorsal plate of bone. When both proximal and distal margins align, provisional K-wire fixation can be accomplished with a proximally directed 0.045 K-wire placed into the fracture fragment just proximal to the subchondral margin. Fluoroscopy is used to check articular alignment and pin placement at this time. The dorsal ulnar fracture can then be held in position with either the ulnar pin plate from the set or a combination of different wire forms.

Once fixation of the ulnar side of the dorsal radius is completed, a similar approach to the radial-side fracture fragment is accomplished. Inspection of the metaphyseal bone loss, gentle manipulation of the subchondral bone surface back into position, packing with bone graft, and replacement of the dorsal cortical plate of bone, which serves to both hold the bone graft in place and support the dorsal subchondral rim of bone, is completed. Wire forms are typically used on the radial side for fracture fixation.

Ulnar Pin Plate

The ulnar pin plate is designed to stabilize dorsal ulnar fractures of the distal radius (Fig. 3). The fracture is reduced and held with a proximally directed oblique K-wire. The location of the K-wire as well as the reduction should be checked with the mini-C-arm. If the location and reduction are acceptable, an ulnar pin plate can be slipped over the protruding end of the K-wire. Because the distal edge of the dorsal lip of the radius is generally visible, it is not necessary to confirm the position of the ulnar pin plate radiographically before securing it to the proximal cortex. The ulnar pin plate comes in 2 sizes (UPP-3 and UPP-5). Select a plate that allows 2 good screws to engage the proximal cortex. Try to insert the screws such that they engage the ulnar half of the radius.

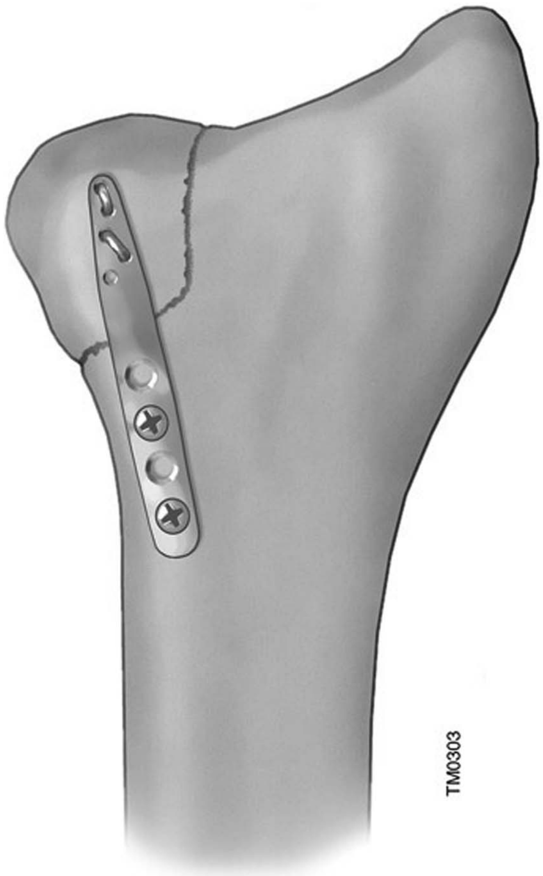

FIGURE 3. Line drawing of an ulnar pin plate fixing a small dorsal ulnar fracture fragment with 2 K-wires. The ulnar pin plate is ideal for small ulnar-sided fragments. Much like the radial pin plate, it acts as a cortical buttress and stabilizes the ulnar-sided pins.

If they are inserted perpendicular to the sloped angle of the dorsal cortex, the screws will end up engaging the volar radial half of the radius and possibly interfere with future component fixation. The plate will need to be twisted to fit the contour of the dorsal ulnar corner of the radius. The amount of twist will best be appreciated after the plate is slipped over the pin and the contour of the bone is compared with that of the plate. The plate can be twisted and bent with the plate holding clamps provided in the equipment tray.

The pin plate is ideal for fixing the small dorsal ulnar lip fractures, which involve both the distal radial ulnar joint and the lunate facet. There will be times, however, when the fracture involves more of the distal radial–ulnar joint and less of the lunate facet; in such situations it is crucial that the dorsal distal radial–ulnar joint ligaments are not detached from the small fragment. When faced with such a fracture, one should place the ulnar pin plate superficial to the ligaments. If the fracture line is radial to the ligaments, the alignment of the fragments is a bit easier. If the fracture line is deep to the ligaments, the mini-C-arm may be necessary to both guide and confirm the reduction.

In some instances the ulnar pin plate can be used without the pin. In such situations the ulnar pin plate will function as a buttress holding the ulnar fragment down and preventing dorsal migration.

Wire Forms

There are 2 basic wire forms: the outer (dorsal) clip, which may or may not be combined with an inner clip (Figs. 4, 5), and a buttress clip, which may or may not be combined with an outer clip (Figs. 6, 7).All clips are secured to the proximal radial cortex with a 2.3-mm self-tapping screw and a washer. The washer allows the screw to grab the wire form and hold it in place. The wire forms are designed with a proximal loop; the wire form can be slid proximally or distally to adjust the amount of support provided until the screw is fully tightened. Because the wire form is held in place with only 1 screw, it is crucial that the screw have excellent bicortical purchase. If there is any doubt as to the integrity of the screw purchase, a longer wire form should be chosen, such that a more proximally located screw and washer is used. Occasionally 2 screws (and their accompanying washers) may be necessary to salvage a long wire form with inadequate screw purchase.

Dorsal Clip. The dorsal clip is the easiest wire form both to conceptualize and to use. The dorsal clip is

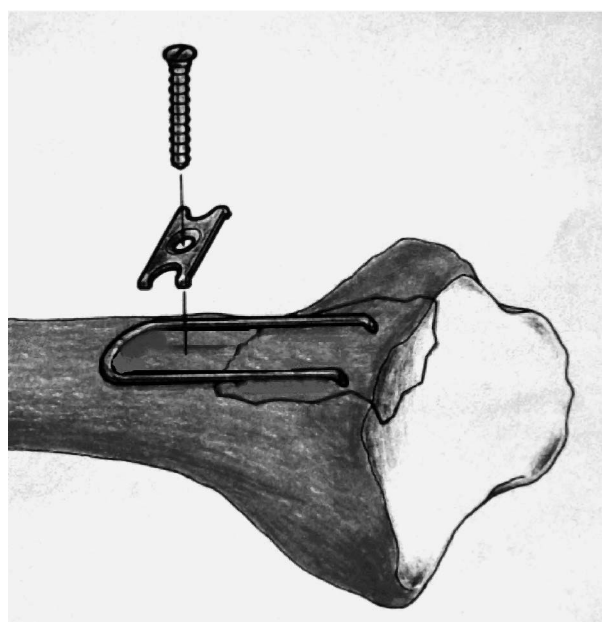

FIGURE 4. Line drawing representing the application of an outer clip for the reduction and stabilization of a dorsal radial fragment.

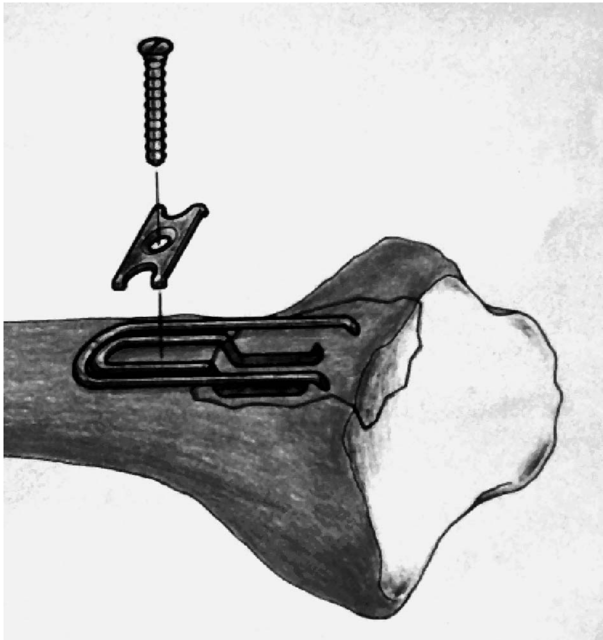

FIGURE 5. Line drawing representing the application of an inner and outer clip combination for the reduction and stabilization of a dorsal radial fragment.

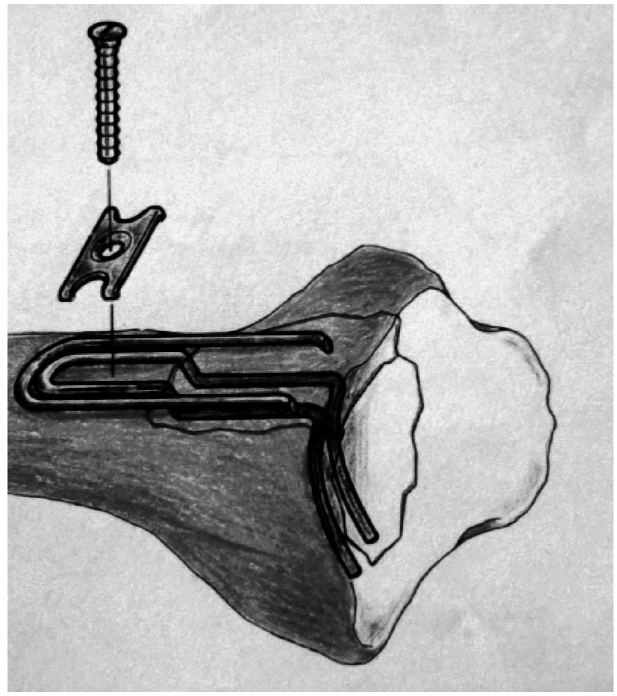

FIGURE 7. Line drawing representing the application of a buttress clip and outer clip combination for the reduction and stabilization of a die punch and dorsal radial fracture.

designed to hold a cortical fragment in place with a downward force. The clip can be used by itself if, on reduction, the displaced bony fragment is stabilized on at least 2 of 4 sides. If the reduced fragment is stabilized by only 1 intact piece of cortical bone, the bone fragment can rotate or shift; in such a situation, it is probably wiser to use a combined inner and outer clip. The dorsal clip can be bent either in an anterior–posterior direction to provide greater downward force or in a medial–lateral direction to accommodate a cortical fragment that is either narrower or wider than the unmodified dorsal clip. The wire forms are best bent with the wire bender provided in the set.

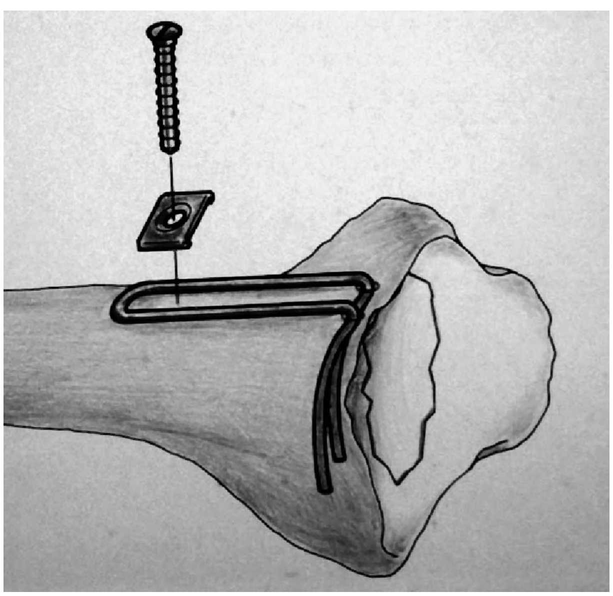

FIGURE 6. Line drawing representing the application of a buttress clip for the reduction and stabilization of an isolated die punch fracture fragment.

Combined Inner and Outer (Dorsal) Clip. Combining an inner and an outer clip holds an unstable piece of cortical bone. It is usually used for dorsal radial fractures but can also be used for dorsal ulnar fractures. To insert the inner clip, a small narrow opening needs to be made at the proximal aspect of the displaced bony fragment. Enough bone is removed to allow the inner clip to be slid under the displaced dorsal fragment; this is most easily accomplished by making 2 small notches in the cortex with a rongeur to allow insertion of the inner clip. The shoulder of the inner wire form should rest flush against the strong proximal cortical bone. If it does not, there is the potential for proximal migration of this inner wire form with subsequent loss of reduction. The length of the inner wire form depends on the size of the displaced bony fragment and the integrity of the proximal cortex. The smaller the distal fragment, the shorter the distal end of the inner wire form, and a weaker proximal cortex requires a longer proximal loop of the inner wire. The distal end of the outer clip should be a bit longer than the distal end of the inner clip and long enough to encircle the proximal end of the inner clip (Fig. 8). If necessary, the outer clip can be bent either in an anterior–posterior or medial–lateral direction.

Buttress Clip. The buttress clip, by itself, is the most infrequently used wire form. It is designed for a central die punch fragment when the dorsal cortex is intact (Fig. 9). Before insertion of the wire form, the radiocarpal joint is exposed, and the displaced die punch fragment is located. A narrow 2 mm × 5 mm window is made in the dorsal cortex in line with and proximal to the displaced fragment. The window allows insertion of the legs of the wire form and supplementary bone graft. The window should be made such that the legs of the buttress clip, when inserted, will support the subchondral bone of the displaced articular fragment. The legs of the wire form will always need to be cut short because they do not need to engage the volar radial cortex. The legs of the wire form can be bent to change the volar tilt of the supported fragment. Once the wire form is secured, bone graft or bone substitute can be inserted through the previously created dorsal window.

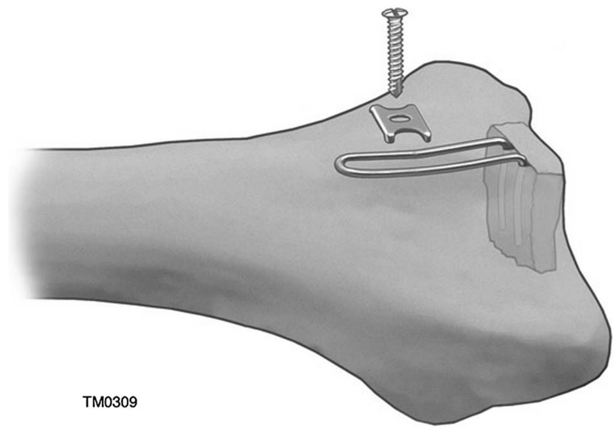

FIGURE 9. Line drawing representing a buttress clip supporting the articular surface in an isolated die punch fracture.

Combined Inner Buttress Clip and Outer (Dorsal) Clip. The most typical fracture pattern we have encountered on the dorsal radial surface is a displaced articular fragment in conjunction with a displaced dorsal cortical fragment (Fig. 10). This type of fracture is well supported by use of an inner buttress clip behind the impacted articular fracture and an outer clip to hold the displaced dorsal fragment (Fig. 11). It is necessary to notch the

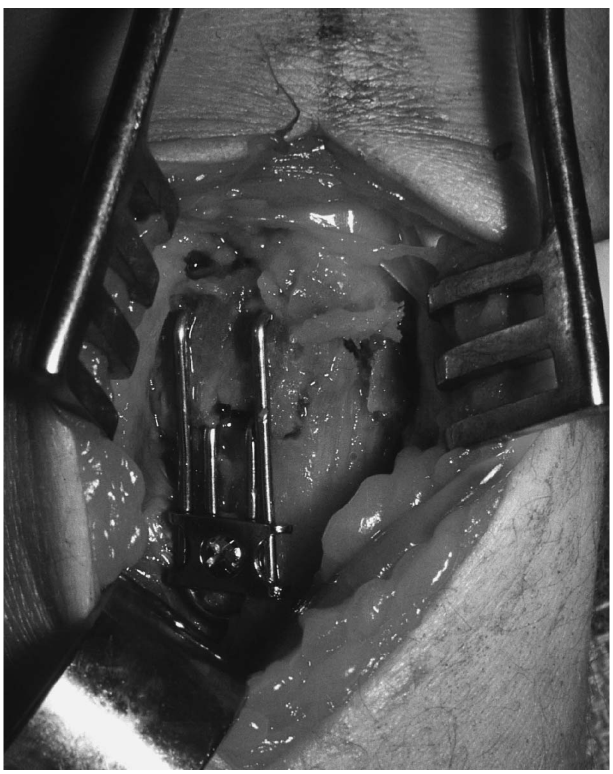

FIGURE 8. Intraoperative photo of an inner outer wire form used to stabilize the dorsal ulnar component of a comminuted distal radius fracture. The outer clip's loop extends proximal to the inner wire form, and both are captured together with a single screw and washer. Note that the dorsal fracture fragment has keyed back into place and is held by the clips.

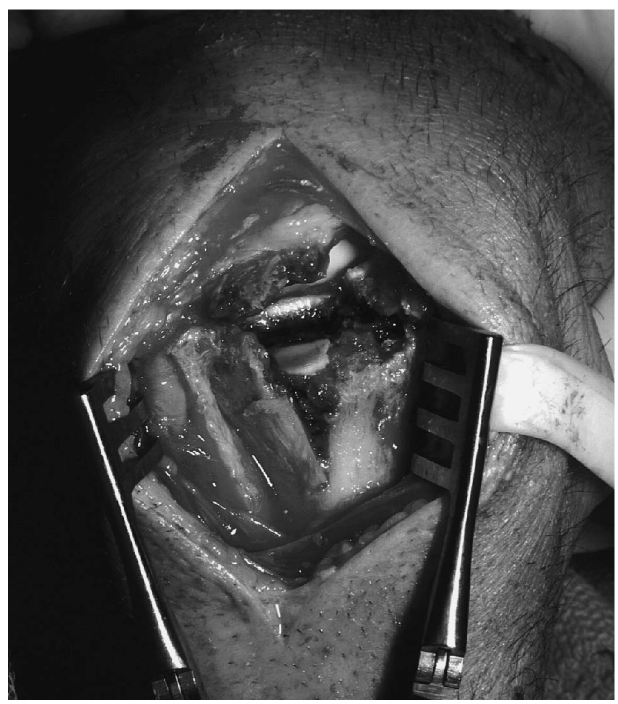

FIGURE 10. The fingers are toward the top of the photograph. This intraoperative photograph represents the typical die punch fragment encountered; a large articular piece wedged into the metaphyseal bone with displaced dorsal fracture fragments.

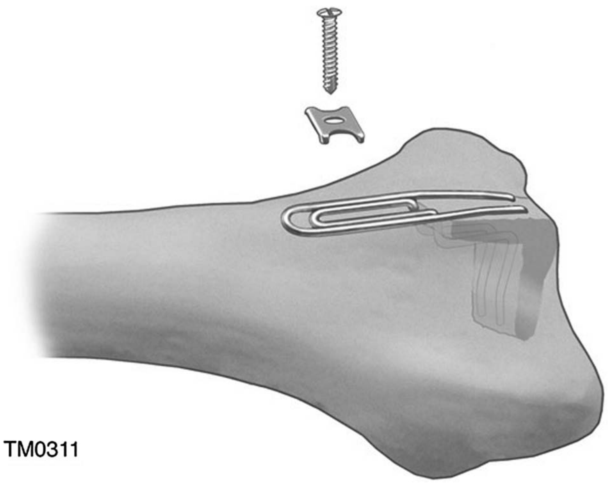

FIGURE 11. Line drawing of an inner buttress clip and outer dorsal clip in place. This would be an appropriate treatment method for the displaced die punch fracture with associated dorsal fracture components, as seen in Figure 10.

cortical bone to allow the inner clip to be positioned under the dorsal fragment and behind the articular surface. Placing the distal bent edge of the inner buttress clip in the dorsal corner of the radius allows the legs to hug the subchondral bone behind the distal radial articular surface. Bending the legs of the inner buttress clip will provide more (or less) volar tilt. The proximal end of the inner buttress clip should be long enough to engage the strong cortical bone at the notches created by the rongeur to prevent proximal displacement of the wire form. The outer dorsal clip should be long enough to provide adequate dorsal support and still encircle the proximal loop of the inner buttress clip.

Radial Pin Plate. The radial pin plate is used to stabilize the radial column (Fig. 12). It is applied to the distal radius deep to the first dorsal compartment through the volar modified Henry approach.

If the provisional radial styloid K-wire is still in good position, then it can be secured to the radial pin plate. Determine which of the 3 radial pin plate lengths (RPP-3, RPP-5, RPP-7) will provide adequate support. The pin plate needs to be long enough to allow fixation proximal to the fracture line with at least 2 good screws. The choice of pin plates is determined by sliding the plate over the protruding end of the K-wire. If the K-wire is relatively proximal to the tuberosity, then the K-wire should be passed through 1 of the more proximal pin holes of the plate. This will allow the second pin to be placed more distally in both the plate and the tuberosity. Plate position should be confirmed with the mini-C-arm. For most fractures, the RPP-3 will suffice.

The plate will almost always appear to be proud above the bone by several millimeters before screw application; however, with good bicortical screw purchase the plate will snug down against the radial column and can usually be counted on to correct several millimeters of radial translation in the process. Usually only 2 screws are necessary, but be careful to keep the screws relatively perpendicular to the long axis of the radius. The contour of the bone and plate in this region will have a tendency to angle the screws, and the distal screw tip may end up in the DRUJ.

The position of the first radial styloid pin will frequently determine the location of the radial pin plate. If the first radial styloid pin is proximal and volar, the plate will rest obliquely with the distal edge volar and the proximal edge dorsal. If the first pin is dorsally placed at the distal edge of the radial styloid, the plate will rest along the lateral aspect of the radius in the midaxial line. We have not noted any clinical difference in this regard.

Before the K-wire is secured to the pin plate, a second K-wire should be inserted. The location of the second K-wire is determined by the position of the first K-wire. If the first K-wire was a bit too proximal, the second K-wire

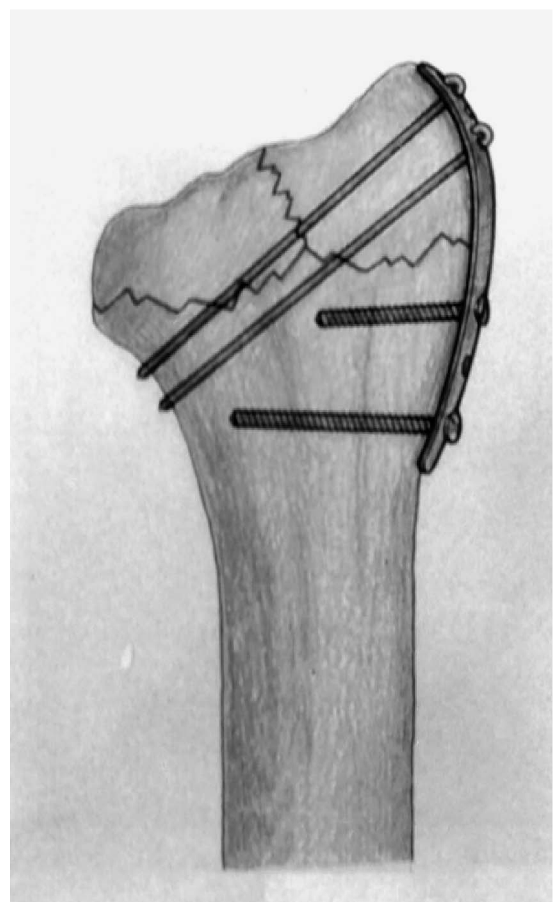

FIGURE 12. Line drawing of the radial pin plate. We advocate bicortical screw purchase and placement of dorsal hardware before the radial pin plate hardware.

should be inserted through one of the distal holes in the pin plate, and vice versa.

Once the second K-wire is in place, the pins can be secured to the plate. Each K-wire needs to be withdrawn, bent, cut, crimped, and impacted into the plate. Working with one K-wire at a time, drill back the K-wire while simultaneously leaning the wire into the plate. The combination of leaning into the plate while backing out the K-wire scores the K-wire with circumferential rings. The rings allow you to determine where to cut and crimp the K-wire. If the K-wire had originally just engaged the distal cortex, then the ring closest to the drill should be at the level of the pinhole once the pin has been impacted.

An alternative method involves using the distinctive 0.045 K-wires with alternating black and silver stripes that are provided in the equipment set. By localizing a stripe location in relation to the plate edge, one can ascertain the correct pin length for bending, cutting, and impacting.

The K-wire is backed out far enough to crimp the end. The bending/crimping tool is positioned such that the center of the tool is just distal to the ring closest to the drill or just distal to the appropriate zebra stripe. After bending, the pin is cut. The modified needle holders are used to narrow the U-shaped bend. The impacting tool is used to reinsert the pin, impacting the cut end into the previously open adjacent pinhole. The cut end can be inserted into the hole just distal or proximal in the pin plate. Once the K-wires and plate are secure, the tissues are allowed to fall back into place. Properly placed, the radial pin plate should not interfere with first dorsal compartment excursion (Fig. 13).

FIGURE 13. Intraoperative photo of the radial pin plate. The plate not only acts as a buttress to the radial column but also increases the stability provided by the radial styloid pins. In place it is low profile and should not affect the tendons of the first dorsal compartment.

COMPLICATIONS

Displaced intraarticular Colles fractures may be associated with significant soft tissue trauma. Nerve and tendon injuries are not uncommon and need to be assessed before proceeding with an open reduction and internal fixation.

The integrity of the skin and the degree of soft tissue swelling will dictate the timing of the surgery and the

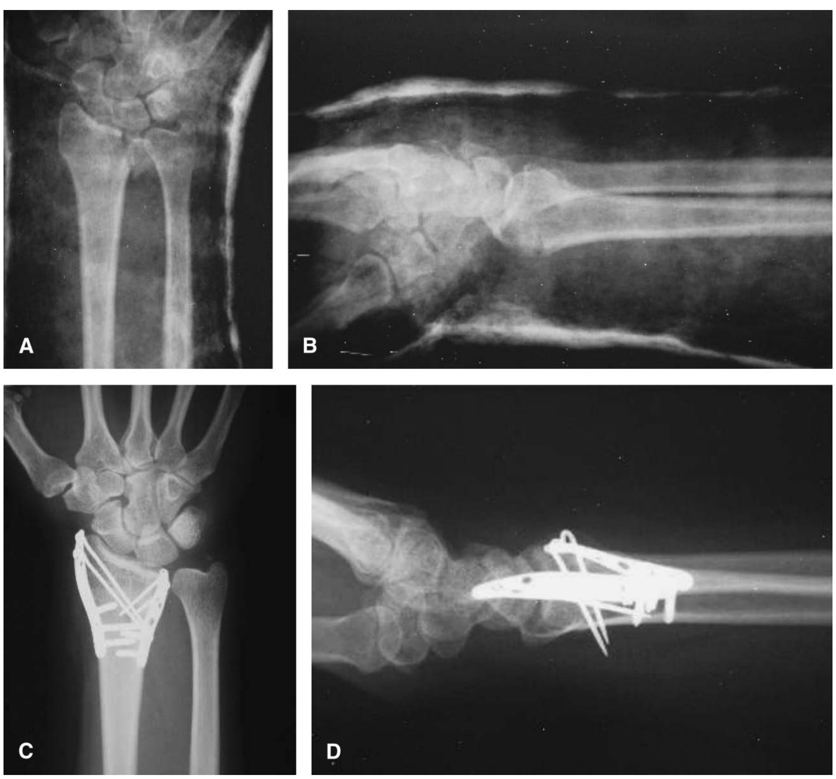

FIGURE 14. Preoperative and postoperative radiographs demonstrating the use of the radial and ulnar pin plate. The lunate facet was elevated and temporarily held in place with a 0.045 K-wire. The K-wire was then supported and secured with an ulnar pin plate. Two K-wires were used with the ulnar pin plate.

location of the incisions. In most situations 2 incisions will be necessary to rigidly fix the radius; occasionally a third incision will be necessary to stabilize the ulnar styloid. In patients with marked swelling it may not be wise to make the third incision because it will be difficult to primarily close the additional incision. In such situations the ulnar fracture will need to be treated nonoperatively with a pronation/supination splint. Skin sloughs between the volar and dorsal incisions have not been seen.

Although the TriMed Wrist Fixation System provides excellent fixation, the device itself can not always prevent collapse in the face of bone loss. Bone graft or bone substitute should be used in patients with osteoporotic bone, displaced articular fragments, and significant bone loss.

The most commonly voiced concern among those who start using the TriMed Wrist Fixation System is the issue of tendon irritation or tendon rupture. Tendon problems do not generally occur with the wire forms. The wire forms have a low profile and are usually under the intact floor of the fourth dorsal compartment. Tendon irritation can occur with either the radial or the ulnar pin plate. The irritation is not caused by the low-profile pin plate but rather by the associated pins, which may back out. Properly inserted, crimped and secured, the pin does not usually back out. Overcrimping allows the pins to close down like a clothespin on insertion into the bone, discouraging loosening and backing out. Pin migration is clinically associated with crepitus and pain. If the fracture is healed and the pin is no longer necessary for stabilization, a migrating pin should be removed; left in place, a migrating pin may fray or rupture an overlying tendon.

■ POSTOPERATIVE CARE

The arm is immobilized in a forearm-based splint. If rigid fixation was obtained, range of motion exercises are begun at 7 to 10 days in formal occupational therapy. A removable splint can be used for temporary support. Within 6 weeks the temporary removable splint should no longer be necessary. The buried hardware has been painful and

FIGURE 15. Preoperative and postoperative radiographs demonstrating a displaced intraarticular scaphoid facet fragment. The displaced fragment can be seen on the PA and lateral radiographs that were taken after application of an external fixator. The intraoperative picture demonstrates both the size and displacement of the articular fragment. The fragment was elevated and supported with cancellous bone graft. Further support was provided by placing the distal end of the inner clip firmly against the subchondral surface of the (now) elevated fragment. The lateral postoperative radiograph shows how far distal the distal end of the inner clip was placed.

needed to be removed in fewer then 10% of our patients. This is generally related to 1 of the pins from the radial or ulnar pin plate backing out. With the more recent bending techniques our incidence of this problem has decreased significantly.

CLINICAL EXAMPLES

Case 1

A 42-year-old man sustained a displaced intraarticular Colles fracture. The fracture line is between the scaphoid and lunate facets. The fracture has collapsed dorsally and proximally. Rigid fixation was obtained with a radial and ulnar pin plate (the simplest of constructs and a good case as an introduction to the system). The ulnar pins are a bit too long, as can be seen on the lateral postoperative x-ray; however, anatomic alignment has been restored, and motion was begun on postoperative day (Fig. 14).

Case 2

A 27-year-old framer sustained a work related die-punch fracture. The initial treatment with an external fixator did not restore the articular alignment. Note the depressed articular fragment seen on both the AP preoperative x-ray and the intraoperative photo. This displaced fracture fragment was reduced and held in place with cancellous bone graft and supported with a combined inner and outer clip. Another option would have been to use a combined inner buttress clip and outer dorsal clip. The patient was able to return to work within 1 month wearing a removable wrist splint (Fig. 15).

CONCLUSION

At first glance, the TriMed Wrist Fixation System may seem a bit intricate, but the concept is quite simple: rigid fixation is obtained with a combination of wire forms and pin plates. The wire forms and pin plates come in different shapes and sizes. Different combinations of wire forms and pin plates will be used based on the fracture pattern and the experience of the surgeon. The variability of the wire forms and pin plates allows the operating surgeon to customize the device to the fracture rather than the fracture to the device.

Properly used, the TriMed Wrist Fixation System provides excellent fracture stability and allows the patient to begin early wrist motion.

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