CLINICAL CASE SERIES

PRECISE
DISTAL RADIUS SYSTEM

Precise SD™ Distal Radial Volar Plate

Treatment of Distal Radius Fractures Utilizing the Precise SD Distal Radial Volar Plating System: A Case Series

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SBi
SMALL BONE INNOVATIONS, INC.

Precise SD™ Distal Radial Volar Plate

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Case 1

Comminuted, Intra-articular, Unstable Left Distal Radius Fracture with Loss of Radial Height and Volar Tilt

HISTORY

The patient was a 41 year old right hand dominant male who was involved in a snow skiing accident. The patient was triaged and treated initially at a local resort medical center where he was diagnosed with a complex, left intra-articular, severely comminuted distal radius fracture with an associated ulnar styloid fracture. He was told that he would likely require an external fixator for treatment by the local orthopedic surgeon. He elected to return to his home town for definitive treatment.

PRE-OP

Patient was seen and evaluated in clinic for the aforementioned injury. He was splinted at initial presentation. He had moderate swelling; however, the skin was intact. He was neurovascularly intact with normal median, ulnar, radial, anterior and posterior interosseous nerve motor function. He had normal light touch sensation in the median, ulnar and radial nerve distribution. There were no signs of carpal tunnel syndrome.

RADIOGRAPHS

Three views were taken of the wrist, including an AP, Lateral and Oblique view. Radiographs showed a left distal radius fracture with significant intra-articular comminution, loss of radial height, dorsal tilt of approximately 30°, and lunate facet displacement. A small associated ulnar styloid fracture was present as well. **(Figures 1-3)**

Pre-Op

Figure 1 AP

Figure 2 Lateral

Figure 3 Oblique

DIAGNOSIS

The patient was diagnosed with a comminuted, intra-articular, unstable left distal radius fracture with loss of radial height and volar tilt as well as ulnar styloid fracture.

TREATMENT PLAN

Treatment options were discussed with the patient. Since he was told he would likely need an external fixator due to the severe comminution, the benefits and disadvantages of this method were discussed. Additional options discussed included a bridging dorsal plate and fracture specific plating. Based on the ability of the Small Bone Innovations Precise SD Distal Volar Locking Plate to achieve stable fixation with the freedom of variable angle screw placement, volar plating was determined to be the best option for successful stabilization and fixation.

INTRA-OPERATIVE

The patient was taken to the operating room, placed in a supine position and a non-sterile tourniquet was inflated to 250 mmHg. The hand was placed in 10 lbs of longitudinal traction through the use of two finger traps and a pulley system attached to the end of the hand table. **(Figure 4)** The fractures were manipulated and provisionally reduced prior to the incision through traction to restore radial length, dorsal to volar forces to obtain neutral tilt, as well as ulnar deviation of the wrist to restore radial height. These reduction maneuvers used ligamentotaxis to grossly align the boney fragments. The manipulation and reduction were guided by and confirmed with fluoroscopic imaging.

* EXPOSURE

A longitudinal incision was made over the flexor carpi radialis. Blunt dissection was made down to the flexor carpi radialis. The sheath was incised longitudinally **(Figure 5)**. The tendon was reflected ulnarly, and the dorsal sheath was then incised. Blunt dissection was then made down to the pronator quadrates by reflecting the flexor mass ulnarly. A blunt self retainer was used to maintain the exposure. A blunt retainer was used to prevent inadvertent injury to the median nerve or radial artery. The pronator quadratus was then exposed and sharply released off the distal and radial aspects of the distal radius exposing the fracture site **(Figures 6 & 7).** The brachioradialis was also released off the radial styloid to allow for reduction of the styloid fragments. The complete Surgical Technique can be downloaded from www.totalsmallbone.com ref# MKT31010.

The articular surface was then reduced through direct manipulation and confirmed with fluoroscopic imaging. A freer was used to tamp the articular surface into position. Once the fracture was reduced, specifically the articular surface, two 0.54 radial styloid pins were placed from the radial styloid through the subchondral bone to maintain the reduction of the articular surface. (In cases where the pins may be required to maintain or supplement the fixation for an extended period, titanium K-wires are recommended to prevent any possible metal interactions.)

Figure 4

Figure 5

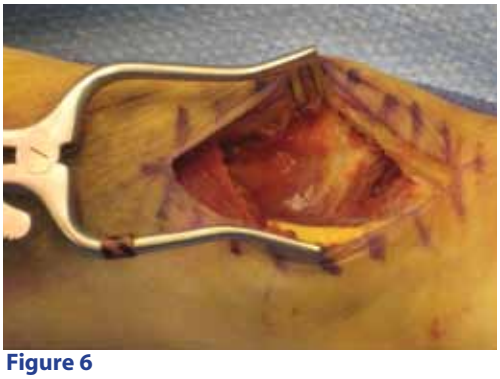

Figure 6

Figure 7

Next, the Precise SD locking plate was positioned over the distal aspect of the radius. Fluoroscopic imaging was used to confirm appropriate placement of the plate.

CAUTION

If the plate is placed too distal, the screws can penetrate the joint. If the plate is placed too proximal, poor subchondral support is obtained. The design of the plate is to fit snugly under the distal radial ridge while supporting the scaphoid fossa and the lunate fossa.

The plate was set in a position where the proximal aspect of the plate is maintained off the radial shaft by about 1 cm. A freer is placed under the plate between the plate and the volar cortex of the radial shaft to prevent the proximal plate from being compressed to the radius inadvertently. By maintaining the plate off the radial shaft, it allows for restoration of the volar tilt once the distal fragments are stabilized and the plate is compressed down to the radial shaft.

Once confirmed with fluoroscopic imaging, two K-wires were then driven through the guide holes in the plate – one through the distal aspect of the plate and another through the proximal aspect of the plate on the radial edge of the plate. The K-wires were cut in half to allow for easy fluoroscopic imaging. **(Figure 8)** Two folded towels were placed underneath the wrist in case a K-wire or drill bit is inadvertently driven through the dorsal skin. This measure will prevent sharp objects from penetrating the drapes and disturbing the sterile field.

Once plate placement was confirmed, the distal screws were placed in a locking fashion. A key elevator was used to place a volar to dorsal force on the plate. **(Figure 9)** This maneuver allows for the plate to be placed flush against the volar aspect of the distal radius and prevents the plate from being too prominent distally which may cause flexor tendon irritation. Additionally, a blue towel was rolled and placed underneath the distal wrist to allow for some restoration of the volar tilt. When the radial styloid is displaced or there is a sagittal split in the articular surface, compression by squeezing the radius towards the ulna can help reduce this split while drilling and placing the distal screws.

Placement of the distal screws is facilitated by the predesigned drill guide. This guide allows for safe placement of screws when the plate is appropriately aligned. The distal screws are generally angulated in a radial fashion. However, a unique benefit of the Precise System allows the guide to be removed and the screws placed in a freehand manner. This feature was utilized in this case to ensure the lunate facet was stabilized. The two most ulnar screws were placed freehand and directed toward the sigmoid notch **(Figure 10)**.

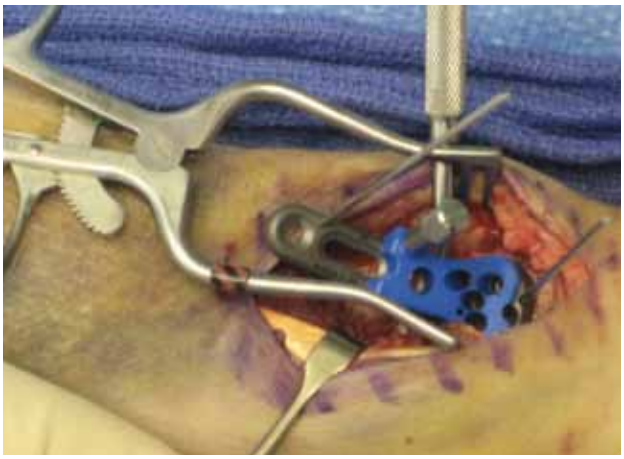

Figure 8

Figure 9

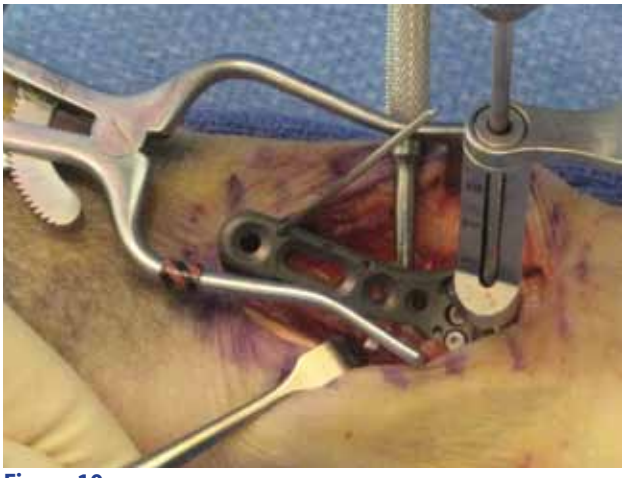

Figure 10

INTRA-OPERATIVE FLUOROSCOPY

Standard AP and Lateral views are helpful in confirming plate and screw placement. However, there are several additional views that can help to ensure appropriate length and placement of hardware. The 20° elevated Lateral view allows for better visualization of the joint surface on a Lateral view. By raising the hand off the table approximately 20° on a Lateral view, the fluoroscopic beam is directed down the radial angle and a good view of the articular surface can be obtained. This view also helps to confirm that screws do not penetrate the joint. A second view can be very helpful in determining if the screws for the radial styloid are protruding dorsally. An Oblique view is obtained by supinating the hand approximately 45°. This view allows a better assessment of the radial styloid screws. Often, these screws can inadvertently be placed too long and can protrude dorsally. This fact will likely not be identified with a standard AP and Lateral.

Once the distal screws were placed and the articular surface stabilized, the plate was used to restore the volar tilt. Again, the plate is secured distally with the proximal aspect of the plate off the radial shaft approximately 1 cm or as needed for appropriate correction **(Figure 11)**. The oblong shaft hole is then filled first using a conventional cortical (non-locking) screw. A conventional screw is used to compress the plate that has been maintained off the radial shaft up until this point.

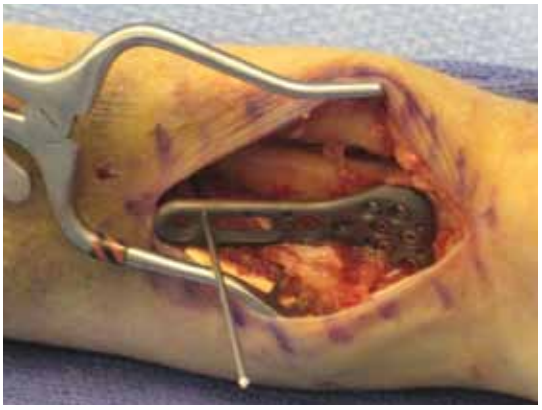

Figure 11

** TECHNIQUE TIPS

There are technique tips that can prevent potential problems in this maneuver. First the drill hole for the oblong hole needs to be drilled perpendicular to the plate (not necessarily perpendicular to the cortical surface). If the screw is not placed perpendicular to the plate, the head can slip through the hole and require distal screw and plate removal to retrieve the screw. The hole is drilled with the proximal pin in place. The screw is started but not tightened. Once the screw has been started, the proximal K-wire is removed from the guide hole in the plate. The guide wire is placed in an oblique (ulnar) direction and can prevent plate compression to the radius if it is not removed. However, it is easiest to get the screw started prior to removing the K-wire. This order will also prevent loss of reduction of the distal radius on the radial shaft. Traction is also released from the wrist once the first shaft screw is provisionally placed. Lastly, a bone tamp is used to manually compress the plate to the radial shaft in order to assist in plate compression and prevent the screw from slipping through the hole in the plate **(Figure 12)**.

Figure 12

Once the compression screw was placed, it was tightened down. Fluoroscopic images were checked to confirm the restoration of the articular surface and the volar tilt. Two additional locking screws were then placed – one in the most proximal screw hole and one in the distal shaft hole **(Figure 13)**. Once the

Figure 13

screws were in place, fluoroscopic images confirmed a well reduced distal radius with restoration of the articular surface, volar tilt as well as radial height. The two provisional subchondral K-wires were removed as they were not needed to maintain stability. Prior to closing, the DRUJ stability was assessed using a volar and dorsal stress in supination, neutral and pronation. In this case, the distal radioulnar joint (DRUJ) was stable to stress and the ulnar styloid was not addressed.

*** WOUND CLOSURE

The wound was irrigated. The pronator quadratus was tacked over top of the plate using 2.0 vicryl suture **(Figure 14)**. Care needs to be taken to prevent injury to the radial artery when repairing the pronator quadratus. Typically, a grasping stitch is required to get an adequate repair of the muscle. The volar flexor carpi radialus sheath was closed using 4.0 vicryl to prevent adherence to the skin. The skin was closed using 4.0 nylon. The wound was then dressed using xeroform gauze, sterile 4x4s, sterile cast padding and a sugar-tong splint was placed in full supination. Supination is preferred to reduce the pull of the brachioradialis on the styloid. It helps maintain stability of the DRUJ. Lastly, supination is typically the hardest motion to obtain in these injuries Post-Operatively; therefore, two weeks in supination can assist in regaining this motion. Finger motion is encouraged from Post-Operative day one.

Figure 14

POST-OPERATIVE RECOVERY

Post-Operatively, the patient was seen back in clinic approximately one week after surgery due to pain and irritation of the skin. The splint was removed, and it was determined the patient had a reaction to the cast padding and was changed over to an orthoplast splint for an additional 4 weeks. Typically, patients are splinted for two weeks followed by casting for an additional 3 weeks. Sutures were removed at 2 weeks. **(Figures 15-17)** Range of motion activities for the hand and forearm rotation were begun under guidance of an occupational therapist starting at 2 weeks Post-Operatively. At 5 weeks Post-Operatively, the patient was given an off the shelf Velcro removable splint and instructed to use this on an as needed basis for comfort. Wrist activities including flexion and extension exercises were initiated at this time. Wrist motion can begin earlier, but typically patients do not participate in wrist activities until their pain has subsided. Therefore, patients are supported with splints / casts until 5 weeks Post-Op when pain is less significant.

2 Week Post-Op

Figure 15 PA

Figure 16 Lateral

Figure 17 Elevated Lateral

The patient was then seen back in clinic approximately 3 months after surgery – good boney healing was confirmed at that time **(Figures 18-20)**. After full boney union, plate removal was discussed with the patient, and he elected to have it removed. The plate was removed at approximately 5 ½ months Post-Operatively. Final radiographs after plate removal showed a well healed distal radius fracture with restoration of the articular surface, radial inclination, radial length and volar tilt **(Figures 21-23)**. Range of motion at final follow up was approximately 80° flexion and approximately 80° of extension. Additionally, he had 80° of supination and pronation. He had no pain within any range of motion. He had returned to full activity including mountain biking and kayaking.

3 Months Post-Op

Figure 18 AP

Figure 19 Lateral

Figure 20 Elevated Lateral

Plate Removed 5 1/2 Months Post-Op

Figure 21 AP

Figure 22 Lateral

Figure 23 Elevated Lateral

Case 2

Active 75 Year Old Female with Unstable, Intra-articular Distal Radius Fracture

HISTORY

A 75 year old right hand dominant female fell on an outstretched left hand. She was evaluated in the emergency department where she was diagnosed with a closed left distal radius fracture. She was provisionally splinted and sent for follow-up.

PRE-OP

The patient presented to the clinic four days after her injury. She is an active 75 year old woman who lives alone and performs all the daily activities required to manage a household. She presented with moderate edema. She was distally neurovascularly intact with no signs of peripheral nerve compression. She had full range of motion of her fingers.

RADIOGRAPHS

Three views of the wrist were obtained that showed an intra-articular distal radius fracture with dorsal comminution, loss of radial height as well as dorsal tilt of approximately 15°. A concomitant ulnar styloid fracture was also seen. **(Figures 1-3)**

DIAGNOSIS

A 75 year old female with a left unstable, intra-articular, distal radius fracture.

TREATMENT PLAN

Treatment options were discussed with the patient. Due to her age, poor bone density, significant dorsal comminution, and joint surface disruption, surgery was recommended. She was informed of the potential risks and benefits of such a procedure. She elected to proceed with open reduction and internal fixation.

Pre-Op

Figure 1 AP

Figure 2 Lateral

Figure 3 Oblique

INTRA-OPERATIVE

The patient was taken to the operating room and placed in the supine position. A non-sterile tourniquet was then inflated to 250 mmHg. The wrist was then provisionally reduced using traction, ulnar deviation and a dorsal to volar force. The wrist was placed in 10 lbs of longitudinal traction using a pulley system attached to the end of the hand table.

EXPOSURE (SEE CASE 1)*

The Precise SD plate was positioned over the fracture. Two K-wires were used to maintain the position – one distally and one proximally. Once positioned, the plate was maintained proximally off the radial shaft approximately 15° of angulation to allow for restoration of the volar tilt. **(Figures 4 & 5)** A freer was positioned underneath the plate in between the distal radius and the plate to maintain the plate off the radius. The proximal K-wire was then driven through the plate into the bone to maintain the height of the plate off the radial shaft.

Figure 4 AP

Figure 5 Lateral

The distal screws were then placed in a locking fashion. During drilling for the distal screws, a key elevator was used to compress the plate down to the distal radius. This maneuver allows the plate to lie flush along the distal aspect of the distal radius. Additionally, the distal radioulnar joint (DRUJ) is squeezed during drilling and screw placement to compress the sagittal split in the joint surface. The distal screw holes were filled with screws. The most ulnar two were drilled freehand without the aid of the drill guide in order to ensure adequate purchase on the lunate facet fragment. Once the distal screws were placed in a locking fashion, the freer was then removed.

INTRA-OPERATIVE FLUOROSCOPY

Fluoroscopic imaging is checked to confirm adequate placement of the distal screws. As previously mentioned in Case #1, four views are recommended to confirm placement and ensure the screws are not too long or in the joint. A standard AP and Lateral view are obtained **(Figures 6 & 7)**. Next an elevated Lateral is obtained where the hand is raised off the hand table approximately 20° in order to image the joint down the radial inclination. **(Figure 8).** Lastly, a 45° supination view is obtained to ensure the radial styloid screws are not too long and protruding out the dorsal cortex **(Figure 9)**.

Figure 6 AP

Figure 7 Lateral

Figure 8 Elevated Lateral

Figure 9 45° Supination Oblique

Once the distal screws were placed and the articular surface stabilized, the plate was used to restore the volar tilt. Again, the plate is secured distally with the proximal aspect of the plate off the radial shaft approximately 1 cm or as needed for appropriate correction. The oblong shaft hole is then filled first using a conventional cortical (non-locking) screw. A conventional screw is used to compress the plate that has been maintained off the radial shaft up until this point.

TECHNIQUE TIPS (SEE CASE 1)**

Next the compression screw was tightened down. Fluoroscopic images were checked to confirm the restoration of the articular surface and the volar tilt. Two additional locking screws were then placed – one in the most proximal screw hole and one in the distal shaft hole. Once the screws were in place, fluoroscopic images confirmed a well reduced distal radius with restoration of the articular surface, volar tilt as well as radial height. **(Figures10-12)** Prior to closing, the DRUJ stability was assessed using a volar and dorsal stress in supination, neutral and pronation. In this case, the DRUJ was stable to stress and the ulnar styloid was not addressed.

Figure 10 AP

Figure 11 Lateral

Figure 12 Elevated Lateral

WOUND CLOSURE (SEE CASE 1)***

POST-OPERATIVE RECOVERY

The patient was seen in clinic approximately 2 weeks after surgery where the sutures were removed. **(Figures 13-15)** The splint was changed to a short arm cast for an additional three weeks. Range of motion exercises were begun at the two week point supervised by an occupational therapist, to work on finger motion as well as forearm rotation. At 5 weeks, the patient was converted to a removable off-the-shelf Velcro splint, which she was to wear on an as-needed basis for comfort. At approximately six months after the injury, she was determined to be well healed based on radiographic findings. The patient elected to have the hardware removed after discussing the risks and benefits of removal versus retaining the hardware. Removal is considered once radiographic union is confirmed. If radiographic union is in doubt, a CT scan can help confirm union prior to plate removal.

2 Week Post-Op

Figure 13 AP

Figure 14 Lateral

Figure 15 Elevated Lateral

Plate Removed 6 Months Post-Op

Figure 16 AP

Figure 17 Lateral

Figure 18 Elevated Lateral

Final radiographs show a well healed distal radius fracture with restoration of the articular surface, radial inclination, radial height and volar tilt. **(Figures 16-18)** At final follow up, the patient had 75° of extension and 90° of flexion. She had full supination and pronation of 90°. She was able to perform her daily activities without pain.

Case 3

Comminuted Intra-articular Volar Barton's Fracture with Carpal Subluxation

HISTORY

The patient is a 35 year old right hand dominant male involved in a motorcycle accident. He was seen and evaluated in a local emergency department where he was diagnosed with a left severely comminuted intra-articular volar Barton's fracture with carpal subluxation. **(Figures 1-3)** The patient was provisionally reduced and splinted.

Initial Radiographs

Figure 1 PA

Figure 2 Lateral

Figure 3 Oblique

PRE-OP

The patient was seen and evaluated in clinic approximately four days after injury. The patient was splinted. His fingers were swollen but well perfused. The patient stated he has had a history of night time paresthesias in both hands for several years. He had decreased light touch sensation in the median nerve distribution subjectively. He had 4mm of two point discrimination in all five fingers.

RADIOGRAPHS

Three views of the left distal radius showed a severely comminuted volar Barton's fracture with carpal subluxation. **(Figures 4-6)**

Pre-Op

Figure 4 PA

Figure 5 Lateral

Figure 6 Oblique

DIAGNOSIS

Left severely comminuted volar Barton's distal radius fracture with carpal subluxation as well as carpal tunnel syndrome.

TREATMENT PLAN

This fracture pattern is highly unstable and is best treated by distal volar radial locking plate. Casting or splinting will not provide adequate stabilization for this type of fracture pattern. The patient elected to proceed with open reduction internal fixation and carpal tunnel release.

INTRA-OPERATIVE

The patient was taken to operating room, placed in a supine position, prepped and draped in the standard fashion, and a non-sterile tourniquet was inflated 250 mmHg. The carpal tunnel was addressed first. Once the carpal tunnel was completely released, the hand was placed in 10 lbs of longitudinal traction through the use of two finger traps and a pulley system attached to the end of the hand table.

EXPOSURE (SEE CASE 1)*

A key elevator was used to expose the fracture. The volar cortex was severely comminuted. A freer was used to elevate the volar lip of the fracture. Manual compression was used to approximate the fracture fragments. Next, the Small Bone Innovations distal radial volar locking plate (Precise SD locking plate) was positioned over the distal aspect of the radius. Once confirmed with fluoroscopic imaging, two K-wires were then driven through the guide holes in the plate. The plate was positioned flat on the surface of the radial shaft.

Once plate placement was confirmed to be in the appropriate position, the middle shaft screw was drilled and a conventional cortical screw was used to compress the plate down to the cortex. By compressing the proximal aspect first, the plate is used as a buttress to compress the volar lip fractures and stabilize the volar lip. Once the volar lip was reduced, the carpal alignment was restored. Two locking screws were then used to fill the shaft holes.

Next, the distal screws were placed. Placement of the distal screws is facilitated by the predesigned drill guide. This guide allows for safe placement of screws when the plate is appropriately aligned. Since the plate was used as a buttress plate, all the holes were not filled. The DRUJ was evaluated and confirmed to be stable.

WOUND CLOSURE (SEE CASE 1)***

POST-OPERATIVE RECOVERY

The patient was seen back at two weeks and transitioned into a short arm cast. He began to work on supination and pronation exercises after two weeks. Radiographs showed well placed hardware with restoration of the joint surface and carpal alignment. **(Figures 7-9)** After five weeks, the patient was converted to a removable splint and allowed to begin range of motion activities with flexion and extension. Radiographs at 5 weeks Post-Op showed early bone healing and continued maintenance of alignment. **(Figures 10-12)**

2 Week Post-Op

Figure 7 AP

Figure 8 Lateral

Figure 9 Elevated Lateral

5 Week Post-Op

Figure 10 AP

Figure 11 Lateral

Figure 12 Elevated Lateral

Case 4

Distal Radius Fracture with Dorsal Comminution with a Displaced Lunate Facet

HISTORY

A 59 year old right hand dominant female fell on her left outstretched hand while getting dressed. She was evaluated in the emergency department where she was diagnosed with a closed left distal radius fracture. She was provisionally splinted and sent to an orthopedist for follow-up.

PRE-OP

The patient presented to the clinic one day after her injury. She is an active 59 year old woman who "wants the best chance at normal long term function despite her injury." She presented with moderate edema. She was distally neurovascularly intact with no signs of peripheral nerve compression. She had full range of motion of her fingers.

RADIOGRAPHS

Three views of the wrist were obtained that showed an intra-articular distal radius fracture with dorsal comminution, loss of radial height as well as dorsal tilt of approximately 25°. The lunate facet was also fractured and displaced on the Oblique view. **(Figures 1-3)**

Pre-Op

Figure 1 PA

Figure 2 Lateral

Figure 3 Oblique

DIAGNOSIS

A 59 year old female with a left unstable, intra-articular distal radius fracture.

TREATMENT PLAN

Treatment options were discussed with the patient. Due to her age, significant dorsal comminution and lunate facet disruption, surgical stabilization was recommended. She was informed of the potential risks and benefits of such a procedure. She elected to proceed with open reduction and internal fixation with distal volar locking plate fixation.

INTRA-OPERATIVE

EXPOSURE (SEE CASE 1) *

A key elevator was used to expose the fracture site. The fracture was reduced under direct visualization. The Small Bone Innovations Precise Distal Volar Radial Locking Plate was then positioned over the fracture. Two K-wires were used to maintain the position. Once positioned, the plate was maintained proximally off the radial shaft with approximately 15° of angulation to allow for restoration of the volar tilt.

The distal screws were then placed in a locking fashion. During drilling for the distal screw, a key elevator was used to compress the plate down to the distal radius to allow the plate to lie flush along the distal aspect of the radius. Additionally, the distal radioulnar joint (DRUJ) is squeezed during drilling and screw placement to compress the saggital split in the joint surface. The distal screw holes were filled with screws. The most ulnar two were drilled freehand without the aid of the drill guide in order to ensure adequate purchase on the lunate facet fragment (see two ulnar screws on Post-Op radiographs).

Once the distal screws were placed and the articular surface stabilized, the plate was used to restore the volar tilt. Again, the plate is secured distally with the proximal aspect of the plate off the radial shaft approximately 1 cm or as needed for appropriate correction. The oblong shaft hole is then filled first using a conventional cortical (non-locking) screw. A conventional screw is used to compress the plate that has been maintained off the radial shaft up until this point.

TECHNIQUE TIPS (SEE CASE 1)**

Once the compression screw was placed, it was tightened down. Fluoroscopic images were checked to confirm the restoration of the articular surface and the volar tilt. Two additional locking screws were then placed. Once the screws were in place, fluoroscopic images confirmed a well reduced distal radius with restoration of the articular surface, volar tilt as well as radial height. Prior to closing, the DRUJ stability was assessed using a volar and dorsal stress in supination, neutral and pronation. In this case, the DRUJ was stable to stress.

WOUND CLOSURE (SEE CASE 1)***

POST-OPERATIVE RECOVERY

The patient was seen in clinic approximately 2 weeks after surgery where the sutures were removed. **(Figures 4 & 5)** The splint was changed to a short arm cast for an additional 3 weeks. Range of motion exercises were begun at the 2 week point, supervised by an occupational therapist, to work on finger motion as well as forearm rotation. At 5 weeks, the patient was converted to a removable

2 Week Post-Op

Figure 4 PA

Figure 5 Lateral

off the shelf Velcro splint which she was to wear on an as needed basis for comfort. **(Figures 6-8)** At approximately six months after the injury, she was determined to be well healed based on radiographic findings. The patient elected to have the hardware removed after discussing the risks and benefits of removal versus retaining the hardware.

5 Week Post-Op

Figure 6 AP

Figure 7 Lateral

Figure 8 Elevated Lateral

Final radiographs show a well healed distal radius fracture with restoration of the articular surface, radial inclination, radial height and volar tilt. **(Figures 9-11)** At final follow up, the patient had 85° of extension and 80° of flexion. She had full supination and pronation of 90°. She was able to perform her daily activities without pain.

Plate Removed 6 Months Post-Op

Figure 9 AP

Figure 10 Lateral

Figure 11 Elevated Lateral

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