Arthrex®

Titanium Volar Distal Radius Plating System

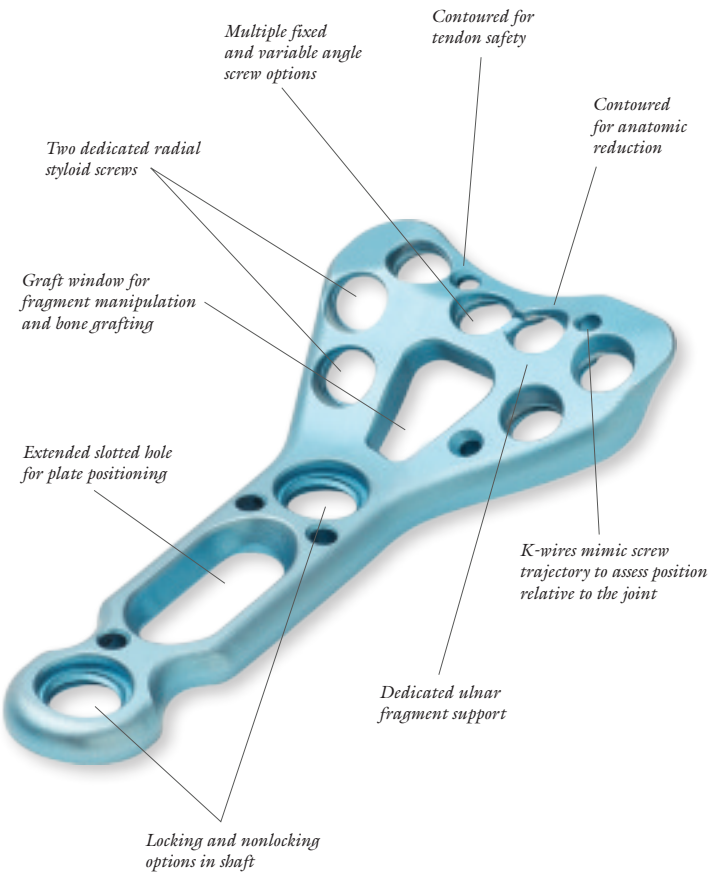
Surgical Technique

Wrist Plating Technique

Wrist Plating System

The Titanium Volar Distal Radius Plating System provides a comprehensive solution for distal radius fracture management. A comprehensive offering of volar plates are available in narrow, standard and wide, as well as in multiple shaft lengths. A variety of screw fixation options, aiming guides and instrumentation allows for customization, according to surgeon preference and complexity of the fracture. The Wrist Plating System is developed to provide the solution to your distal radius fixation needs.

Features of the Volar Distal Radius Plate



Indications

The Wrist Plating System is designed for fixation of intra-articular and extra-articular fractures, osteotomies, as well as nonunions and malunions of the distal radius.

Advantages

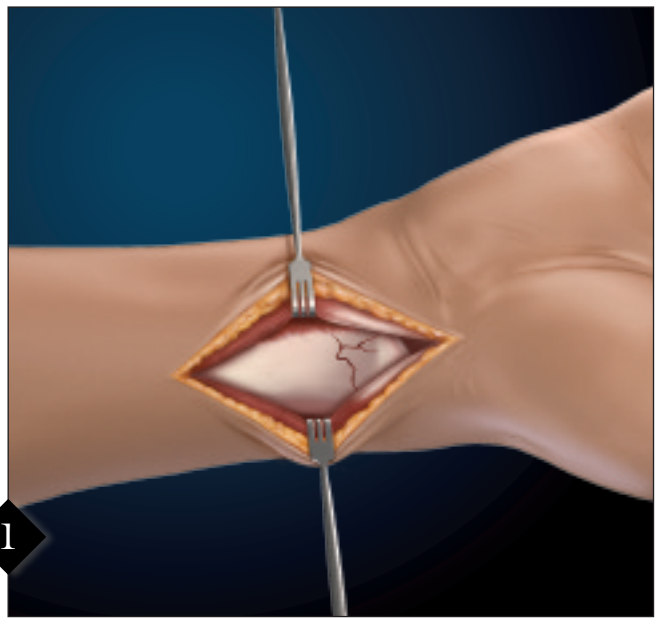
Anatomic
Plates are developed to fit the anatomy and contours of the distal radius for a low profile repair and anatomic reduction of the fracture.

Comprehensive
In addition to a comprehensive plate selection, multiple screw options are available including fixed angle locking, variable angle locking and nonlocking options.

Options

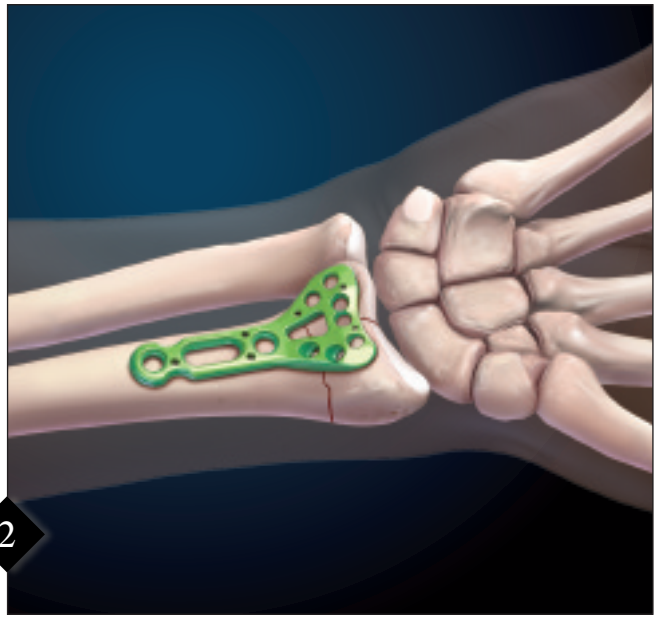
Fracture patterns create unique challenges and the variety of fixation options included allow multiple solutions for even the more complex fracture patterns.

Straightforward Instrumentation
The modular set layout allows for easy identification of appropriate instruments and reduces confusion in the OR. Proper screw length is verified through visual inspection with the graduated screw caddy, reducing the time needed to measure screws by hand.

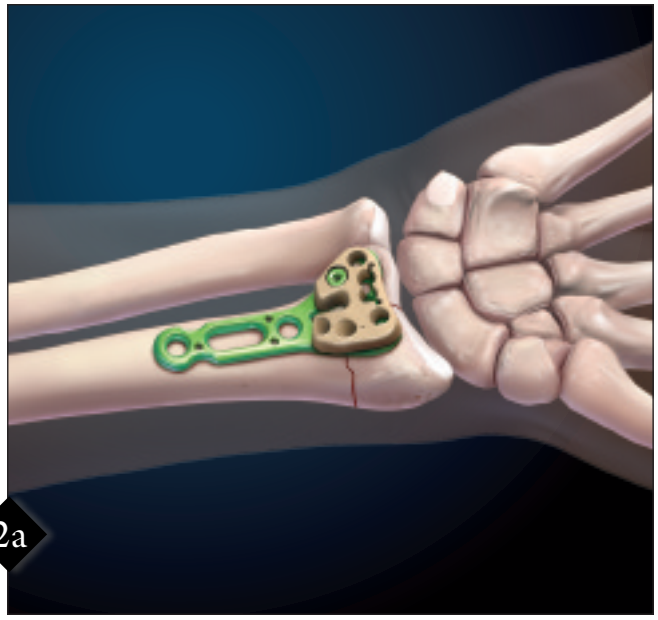


The patient's forearm is supinated to expose the surgical site. To assist with exposure, a towel or bump may be placed under the wrist, placing it in extension. Make a longitudinal incision approximately 6 – 8 cm in length just radial to the flexor carpi radialis (FCR) tendon to protect against injury to the palmar cutaneous branch of the median nerve. The tendon sheath is opened, the radial artery is protected, and the tendon is retracted ulnarly. The flexor pollicis longus is identified and retracted ulnarly to protect the median nerve. The pronator quadratus is identified by its transverse fibers and is released radial to ulnar to expose the fracture site.

Developed in conjunction with
Thomas Trumble, MD, Bellevue, WA; and Christopher Sforzo, MD, Sarasota, FL

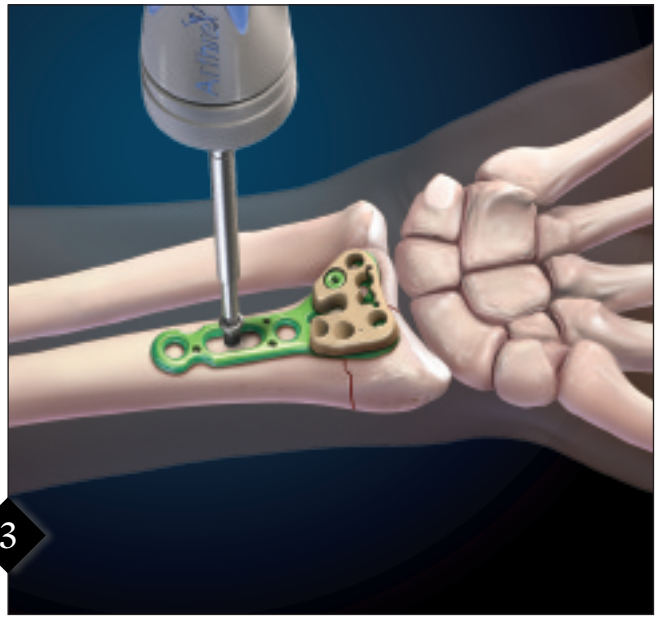


The fracture is reduced manually and evaluated under fluoroscopy. The brachioradialis is released subperiosteally from its radial and distal insertion as needed to facilitate reduction of the fracture site. Transstyloid K-wires may be used for provisional fixation of the fracture. The plate is designed to sit along the distal aspect of the radius to support the volar articular fracture fragments. The plate sits just proximal to the watershed line to minimize tendon irritation.

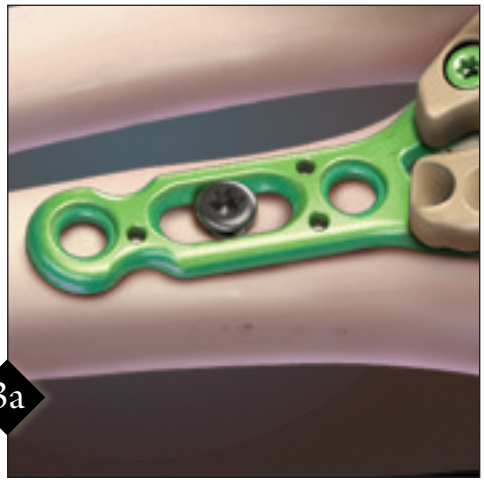


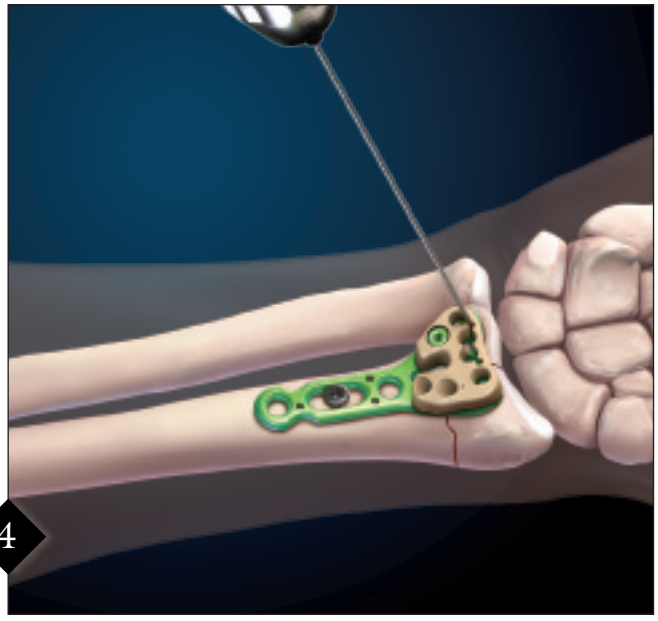
Once the appropriately sized plate is selected, attach the corresponding PEEK Aiming Guide using the set screw. This may be done prior to plate placement for ease of attachment on the back table prior to insertion.

Optional: The plate's position can be temporarily secured at this time by using a threaded or nonthreaded BB-Tak™ in the shaft of the plate. The BB-Tak allows for a fast, temporary fixation and can be placed through any proximal shaft K-wire hole or proximal shaft screw hole.



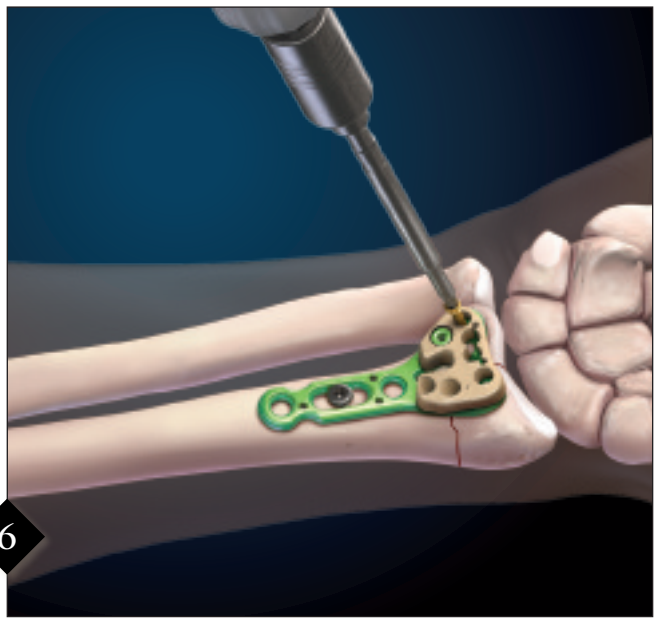
Using the 2.5 mm Drill Bit and Drill Guide, drill and place a 3.5 mm nonlocking Cortical LPS Screw through the slot in the plate shaft. The position of the plate relative to the articular surface can subsequently be fine-tuned by loosening and sliding the plate proximal or distal, if necessary.

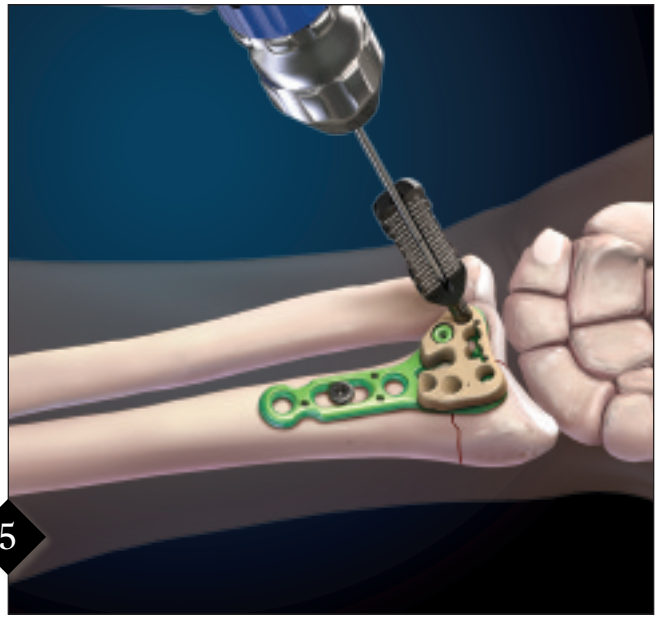




Screw depth is measured using the 3.5 mm sliding Depth Guide. K-wire holes in the distal aspect of the plate accept 1.35 mm or 0.054" K-wires, which can be used to assess distal-proximal placement of the plate. If the K-wires are proximal to the joint surface, all fixed angle screws will be proximal to the joint surface as well.

Verify K-wire placement using multiple fluoroscopic views to verify that the fixed angle trajectory is proximal to the articular surface. If these distal K-wires are not in the joint, the fixed angle screws will not be either. If adjustments are necessary, remove the K-wire and loosen the 3.5 mm nonlocking screw in the shaft slot to adjust proximally or distally as needed. Repeat insertion of distal K-wires until satisfactory placement is achieved.





Once proper plate placement is achieved and verified under fluoroscopy, the drop-in Drill Guide is placed into the PEEK Aiming Guide and the 1.7 mm graduated Drill Bit is drilled through to the second cortex. The depth measurement can be read off the laser line of the graduated Drill Bit.

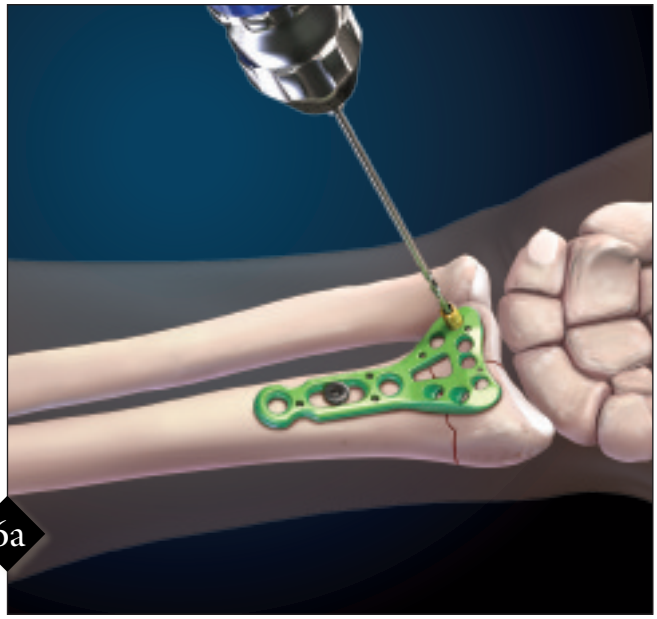
A measuring probe is also included in the set to measure after drilling for a more controlled measurement, if desired.

Once the appropriate screw length is selected, choose either a 2.4 mm locking VAL Screw, nonlocking Cortical LPS Screw, or smooth shaft VAL Near Cortex Screw. The screw can be advanced by hand with the appropriate T8 Driver through the PEEK Aiming Guide. The screw will seat firmly into the plate when fully seated. Do not overtighten screws. Stop once screw is seated and resistance is met. An optional torque-limiting driver can be used for final screw tightening if desired. Confirm proper placement of screw with fluoroscopic imaging.

Note: Gold 2.4 mm VAL Screws are used for both fixed angle and variable angle locking constructs.

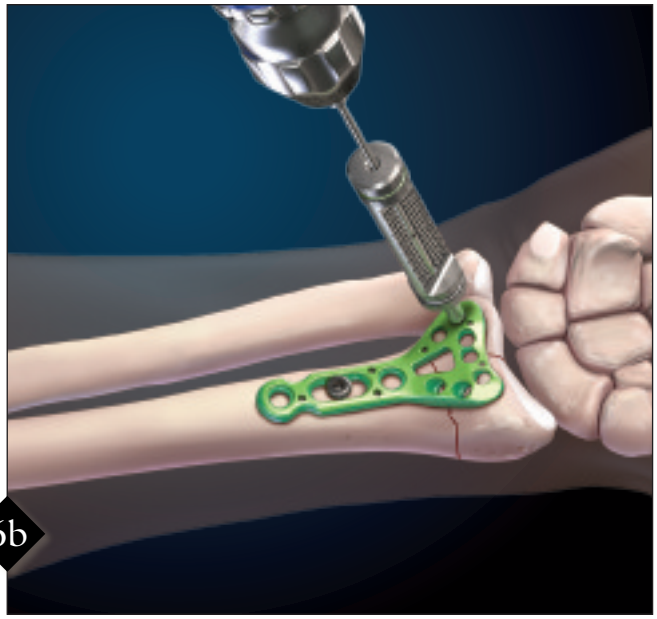
Repeat Steps 5 and 6 to fill the remaining head holes as needed with the appropriately sized screws.

Optional torque-limiting handle for use with 2.4 mm VAL Locking Screws

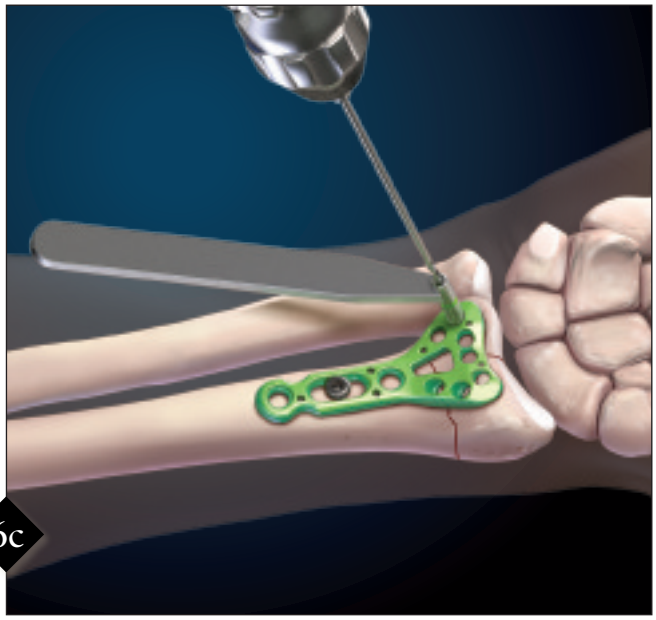


Additional Screw Aiming Options
Several alternative aiming options are available.

1.7 mm Drill Sleeve Option
Individual 1.7 mm Drill Sleeves can be loaded into each screw hole to provide a fast-drilling option. The 1.7 mm Drill Bit can be placed through the center of the Drill Sleeves and offer the same fixed angle trajectory as the PEEK Aiming Guide. Once the drill has advanced through both cortices, the sleeve must be removed and screw depth measured with the appropriate sliding Depth Guide.

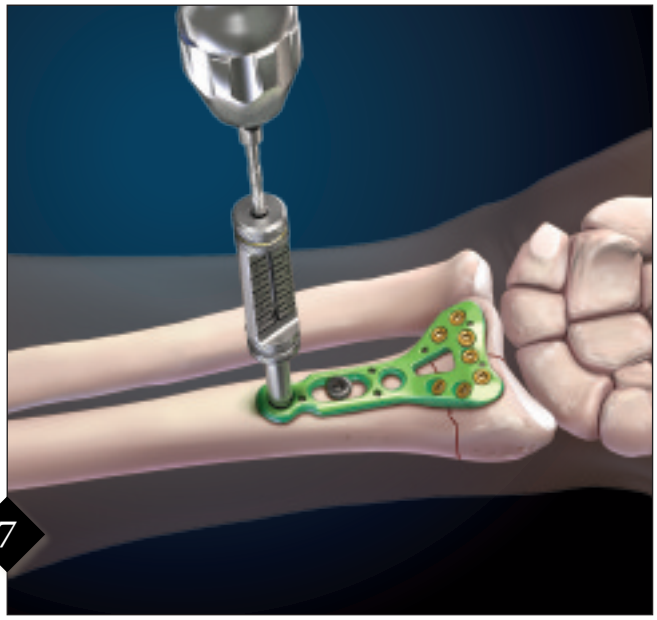


Threaded Locking Drill Guide Option
A standard threaded Drill Guide is also available for the head and is graduated to the laser marked 1.7 mm Drill Bit. If desired, the Measuring Probe can be used after drilling to obtain a more controlled and precise measurement.



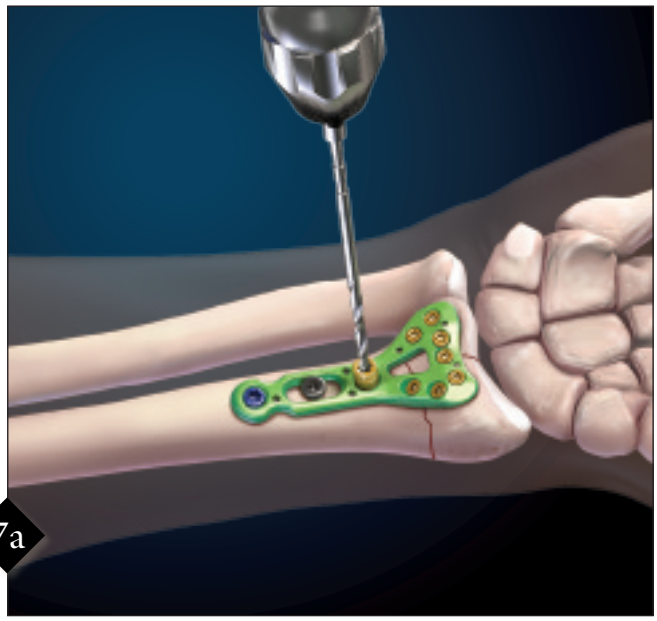
Variable Angle Drill Guide Option
A 2.4 mm Variable Angle Drill Guide is available which allows a 20° cone of variability for each screw option in the head of the plate. The 2.4 mm Variable Angle Drill Guide is pressed firmly into the plate hole and a positive stop is felt at the maximum angulation. The 2.4 mm gold VAL Locking Screws provide locking fixation when using the VAL guide, as well as fixed angle locking constructs.

After drilling both cortices, remove the guide and measure the screw depth with the appropriate sliding Depth Guide.



Final Shaft Fixation
Once the distal screws are placed to stabilize the fracture fragments, thread the 3.5 mm threaded Drill Guide for the 3.5 mm Locking Screws into the remaining locking shaft holes.

To obtain appropriate screw length, drill bicortically, measure screw depth using the graduated 2.5 mm Drill Bit, or use the appropriate sliding Depth Guide.



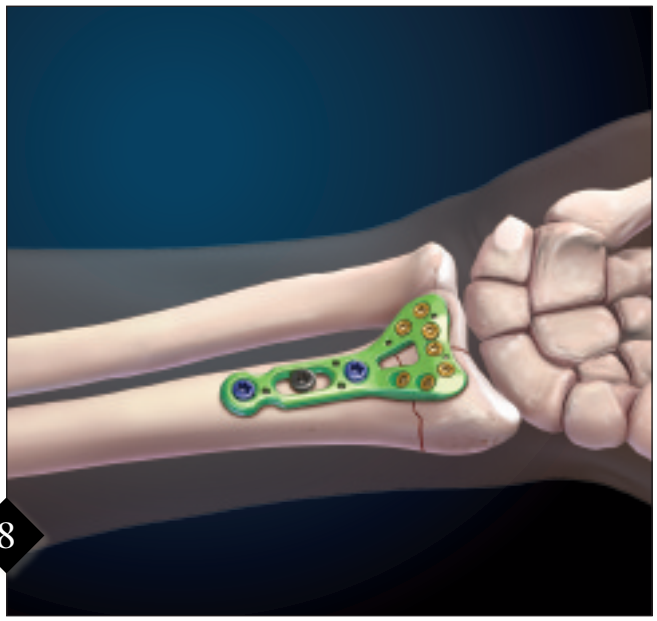
2.5 mm Drill Sleeves
In addition to the threaded 3.5 mm locking Drill Guide, individual 2.5 mm Drill Sleeves are available for the 3.5 mm Locking Screws as well. These can be screwed into the appropriate locking shaft holes and drilled with the 2.5 mm Drill Bit.

The 2.5 mm Drill Sleeves are removed with the T15 Driver and screw depth is measured with the appropriate sliding Depth Guide.

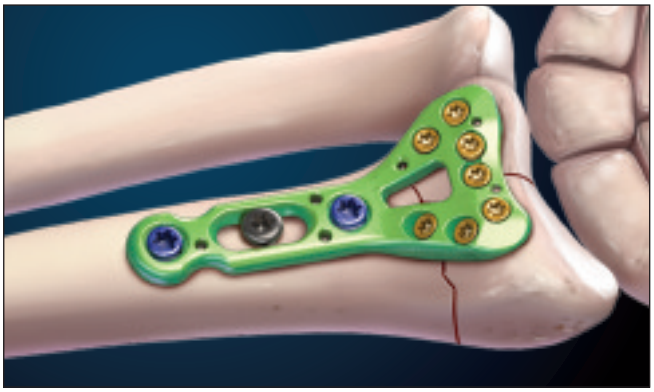
Plate with Variable Angle Guide

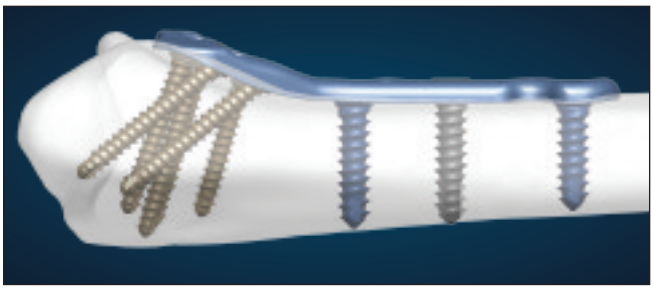
Plate with PEEK Aiming Guide

Plate with Drill Sleeves



Once all screws have been placed, verify appropriate fracture reduction, screw placement and length with multiple fluoroscopic views. Additional views such as tilt AP, tilt lateral, 45° pronated and 45° supinated can help verify the proper placement of the screws.



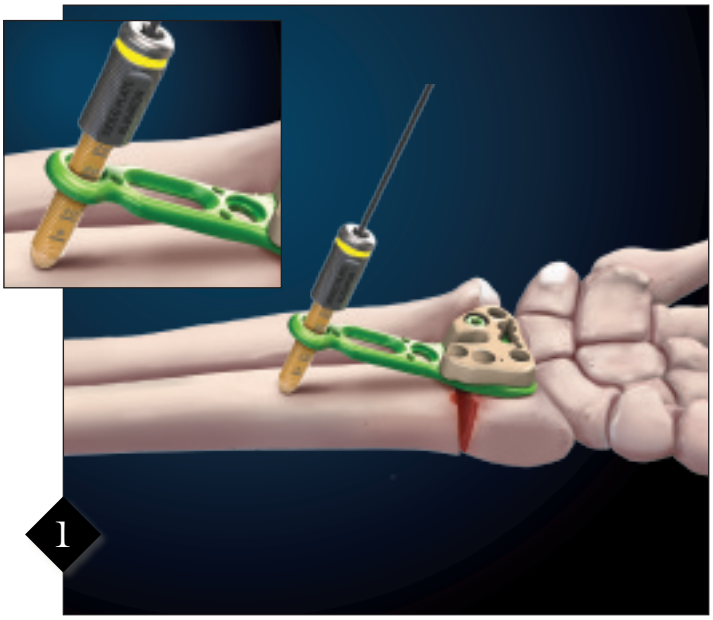


Final fixation with screw trajectory

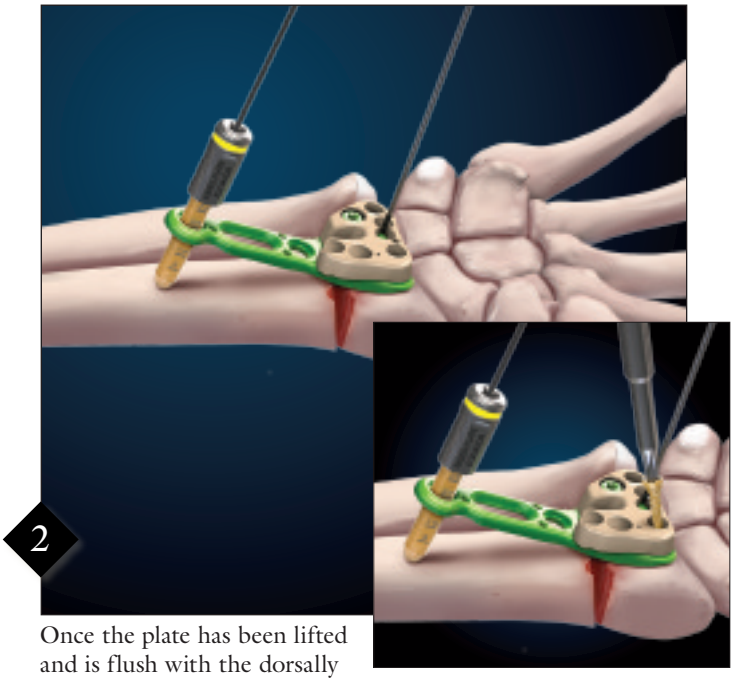
Alternate Technique: Fracture Reduction

The threaded Plate Elevator can be used as an alternative fracture reduction tool for dorsally displaced fractures or for use in corrective osteotomies. The Plate Elevator threads into the second proximal locking hole in the shaft of the plate and is used to raise the plate until the head of the plate is flush with the dorsally displaced distal fracture fragments.

Once the plate shaft is brought back flush to the radial shaft, the measurements on the Plate Elevator shaft indicate the degree of volar correction obtained while reducing the fracture or performing the corrective osteotomy. Up to 30° of volar tilt correction is possible.

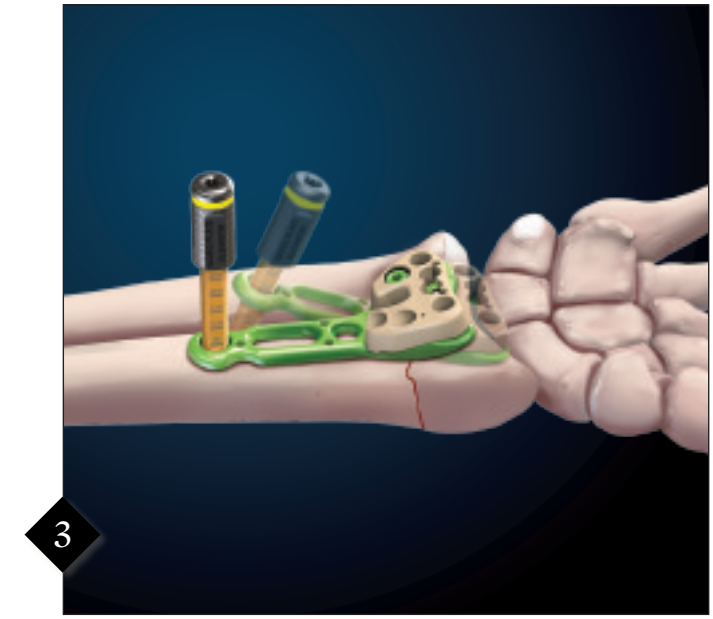


The Plate Elevator can be threaded by hand until the desired height is achieved or the T15 Driver can be used. The Plate Elevator is also cannulated to accept a 1.35 mm K-wire to aid in stabilizing the plate once desired height is achieved.

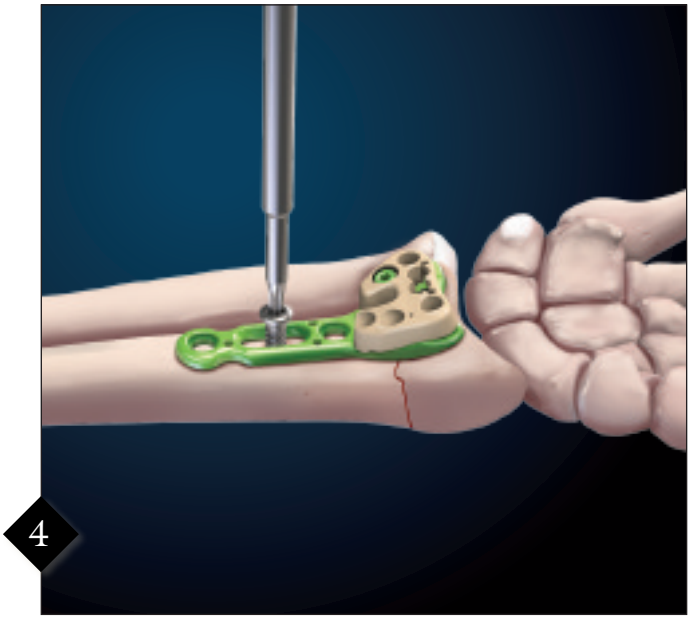


Once the plate has been lifted and is flush with the dorsally displaced fracture fragments, the distal K-wire holes can be used to assess screw placement in relation to the joint surface as described previously.

The 2.4 mm Locking Screws can then be placed into the plate using the methods described previously.



Once the 2.4 mm Locking Screws are placed distally, the K-wire can be removed from the elevator, if used, and the elevator unthreaded. The plate is then brought back to the radial shaft and reduction of the distal fracture fragments is achieved.



Once the reduction is obtained, the 3.5 mm Nonlocking Screw can be placed into the slotted shaft of the plate to reduce the plate to the radial shaft. 3.5 mm Locking Screws can then be added to the remaining shaft holes for final fixation.

Assess final plate placement, screw positions and satisfactory reduction under x-ray imaging prior to closing.

Ordering Information

Wrist Plating System (AR-8916S) includes:	
Wrist Plating System Case	AR-8916C

Aiming Guides:	
Aiming Guide, Narrow, Right	AR-8916-03
Aiming Guide, Narrow, Left	AR-8916-04
Aiming Guide, Standard, Right	AR-8916-01
Aiming Guide, Standard, Left	AR-8916-02
Aiming Guide, Wide, Right	AR-8916-20
Aiming Guide, Wide, Left	AR-8916-15

Instrumentation for 2.4 mm VAL and Cortical Screws:	
Drill Bit, 1.7 mm, graduated	AR-8916-14
Drill Guide, 2.4 mm VAL DRP	AR-8916-21
Drill Guide, (Aiming Guide), 2.4 mm	AR-8916-09
Drill Guide, Threaded, 2.4 mm x 40 mm	AR-8950-04
Drill Sleeve, 1.7 mm	AR-8916-18
Measuring Probe Drill Guide, 2.4 mm	AR-8916-08
Depth Guide, 2.4 mm Screws	AR-13120G-2
Drive Shaft, T8, QC	AR-8916-11
Screwdriver, T8, Solid	AR-8916-22

Instrumentation for 3.5 mm Locking and Cortical Screws:	
Drill Guide, Threaded, 3.5 mm x 30 mm	AR-8916-07
Drill Sleeve, 2.5 mm	AR-8963-06
Drill Bit, 2.5 mm, graduated	AR-8916-06
Plate Elevator, Threaded, 3.5 mm x 30°	AR-8916-12
Depth Guide, 3.5 mm Screws	AR-8943-15
Drive Shaft, T15, Solid, QC	AR-8941DH
Screwdriver, T15	AR-8943-10

General Instrumentation:	
Plate Bending Iron	AR-8916-10
Palm Handle, QC	AR-8916-25
Ratcheting Handle, QC	AR-8950RH
Screw Holding Sleeve, 2/2.4 mm	AR-8920H
Screw Holding Sleeve, 2.7, 3.5 and 4 mm	AR-8943-11
Freer Elevator	AR-8943-19
Sharp Hook	AR-8943-21
Hohmann Retractor, 8 mm	AR-13210
Hohmann Retractor, 15 mm	AR-8943-22
Screw Forceps	AR-8941F
Drill Guide, 2.5/1.7 mm	AR-8916-23
Bone Reduction Forceps	AR-4160FT
Periosteal Elevator	AR-8943-20
Lobster Claw	AR-8943-23

Optional:	
Torque Limiting Screw Driver for 2.4 mm Locking Screws	AR-8916TL-01

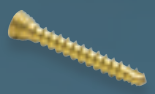
Wrist Plating System – AR-8916S

Plates:	
Volar Distal Radius Plate, Narrow, Right, 3H	AR-8916VNR-03
Volar Distal Radius Plate, Narrow, Left, 3H	AR-8916VNL-03
Volar Distal Radius Plate, Narrow, Right, 5H	AR-8916VNR-05
Volar Distal Radius Plate, Narrow, Left, 5H	AR-8916VNL-05
Volar Distal Radius Plate, Narrow, Right, 7H	AR-8916VNR-07
Volar Distal Radius Plate, Narrow, Left, 7H	AR-8916VNL-07
Volar Distal Radius Plate, Standard, Right, 3H	AR-8916VSR-03
Volar Distal Radius Plate, Standard, Left, 3H	AR-8916VSL-03
Volar Distal Radius Plate, Standard, Right, 5H	AR-8916VSR-05
Volar Distal Radius Plate, Standard, Left, 5H	AR-8916VSL-05
Volar Distal Radius Plate, Standard, Right, 7H	AR-8916VSR-07
Volar Distal Radius Plate, Standard, Left, 7H	AR-8916VSL-07
Volar Distal Radius Plate, Wide, Right, 3H	AR-8916VWR-03
Volar Distal Radius Plate, Wide, Left, 3H	AR-8916VWL-03
Volar Distal Radius Plate, Wide, Right, 5H	AR-8916VWR-05
Volar Distal Radius Plate, Wide, Left, 5H	AR-8916VWL-05
Volar Distal Radius Plate, Wide, Right, 7H	AR-8916VWR-07
Volar Distal Radius Plate, Wide, Left, 7H	AR-8916VWL-07

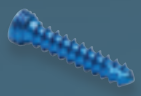
2.4 mm Screws:	
VAL Screw, titanium, locking, 2.4 x 8 mm – 34 mm (2 mm increments)	AR-8724V-08 – 34
VAL Near Cortex Screw, titanium, locking, 2.4 x 8 mm – 34 mm (2 mm increments)	AR-8916VNC-08 – 34
Cortex Screw, titanium 2.4 x 8 mm – 34 mm (2 mm increments)	AR-8916CX24-08 – 34

3.5 mm Screws:	
Locking Screw, titanium, 3.5 mm x 10 mm – 20 mm (2 mm increments)	AR-8935L-10 – 20
Cortical LPS Screw, titanium, 3.5 mm x 10 mm – 14 mm (1 mm increments)	AR-8935-10 – 14
Cortical LPS Screw, titanium, 3.5 mm x 16 – 20 mm (2 mm increments)	AR-8935-16 – 20

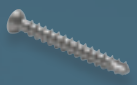
Disposables:	
Guidewire w/Trocar Tip, 1.35 mm	AR-8943-01
BB-Tak, 1.6 mm	AR-13226
BB-Tak	AR-13266-08 - 30



2.4 mm VAL Screw
AR-8724V-18



3.5 mm Locking Screw
AR-8935L-18



2.4 mm Cortex Screw
AR-8916CX24-18

3.5 mm Cortical Screw
AR-8935-18

2.4 mm VAL Near Cortex Screw
AR-8916VNC-18

This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional should rely on their own training and experience and should conduct a thorough review of pertinent medical literature and the product's Directions For Use.

Arthrex®

www.arthrex.com

. . . up-to-date technology just a click away

View U.S. patent information at www.arthrex.com/corporate/virtual-patent-marking