

Titanium Volar Distal Radius Plating System

Surgical Technique

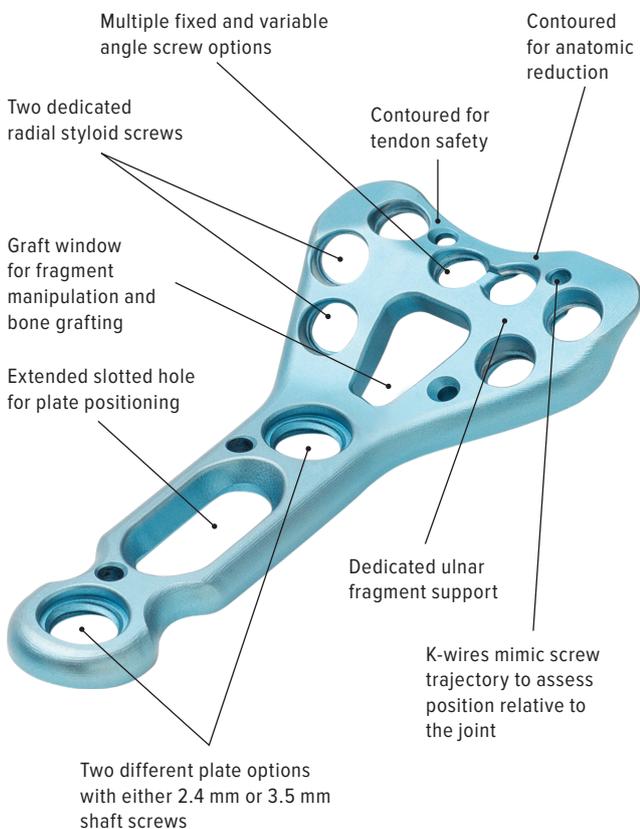


The Arthrex Wrist Plating System

Features and Benefits

The Titanium Volar Distal Radius Plating System provides a comprehensive solution for distal radius fracture management. Volar plates are available in narrow, standard, and wide, as well as in multiple shaft lengths. The volar plates are now offered with two different screw shaft options, 2.4 mm and 3.5 mm. A variety of aiming guides and instrumentation also allows for customization, based on surgeon preference. The Wrist Plating System, which includes both the volar and fragment specific plates, is developed to provide the solution to your distal radius fixation needs.

Features of the Volar Distal Radius Plate



Applications

The Wrist Plating System is designed for fixation of intra-articular and extra-articular fractures, osteotomies, and 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 (VAL), and nonlocking options. The plate is available with either 3.5 mm or 2.4 mm shaft screws to accommodate surgeon preference.

Options

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

Straightforward Instrumentation

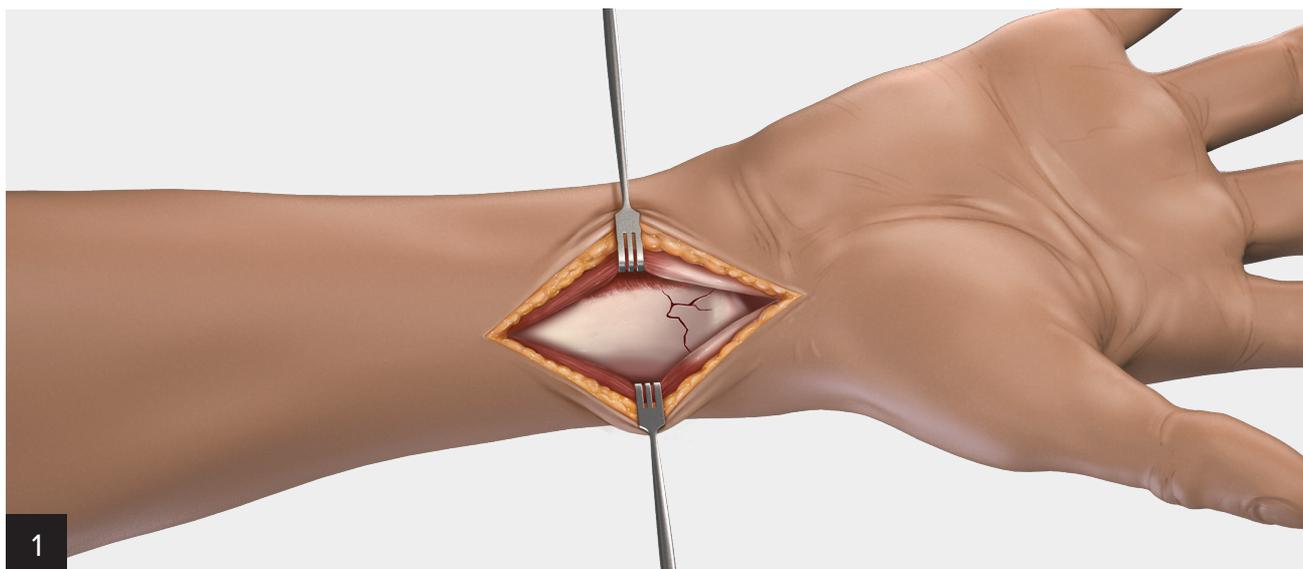
The modular set layout allows for easy identification of appropriate instruments and reduces confusion in the OR. Proper screw length is verified through visual inspection with the graduated screw caddy, reducing the time needed to measure screws by hand.



2.4 mm/3.5 mm plate
2.4 mm distal screws with 3.5 mm shaft screws

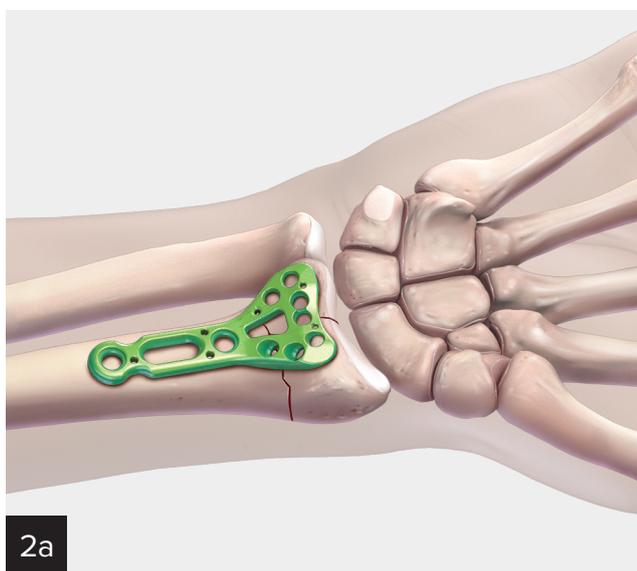


2.4 mm plate
2.4 mm screws in both the head and shaft

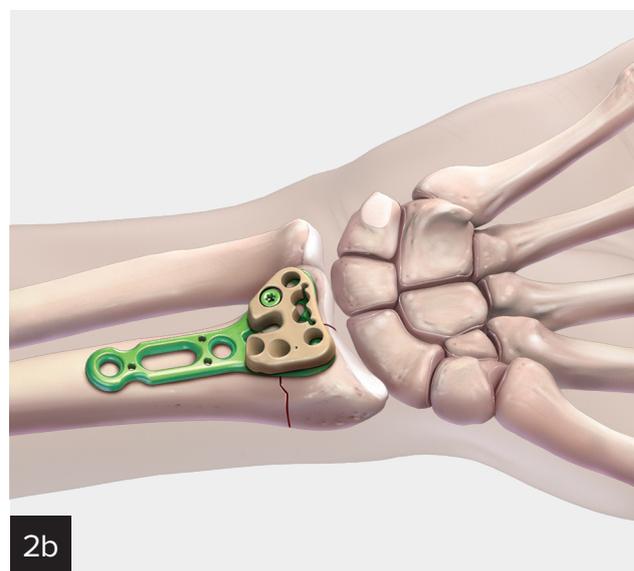


Supinate the patient's forearm to expose the surgical site. To assist with exposure, a towel or bump may be placed under the wrist, placing it in extension. Make a longitudinal incision approximately 6 cm - 8 cm in length just radial to the flexor carpi radialis (FCR) tendon to protect against injury to the palmar cutaneous branch of the median nerve.

Open the tendon sheath, protect the radial artery, and retract the tendon ulnarly. Identify the flexor pollicis longus and retract ulnarly to protect the median nerve. The pronator quadratus is identified by its transverse fibers. Release it radially to ulnarly to expose the fracture site.

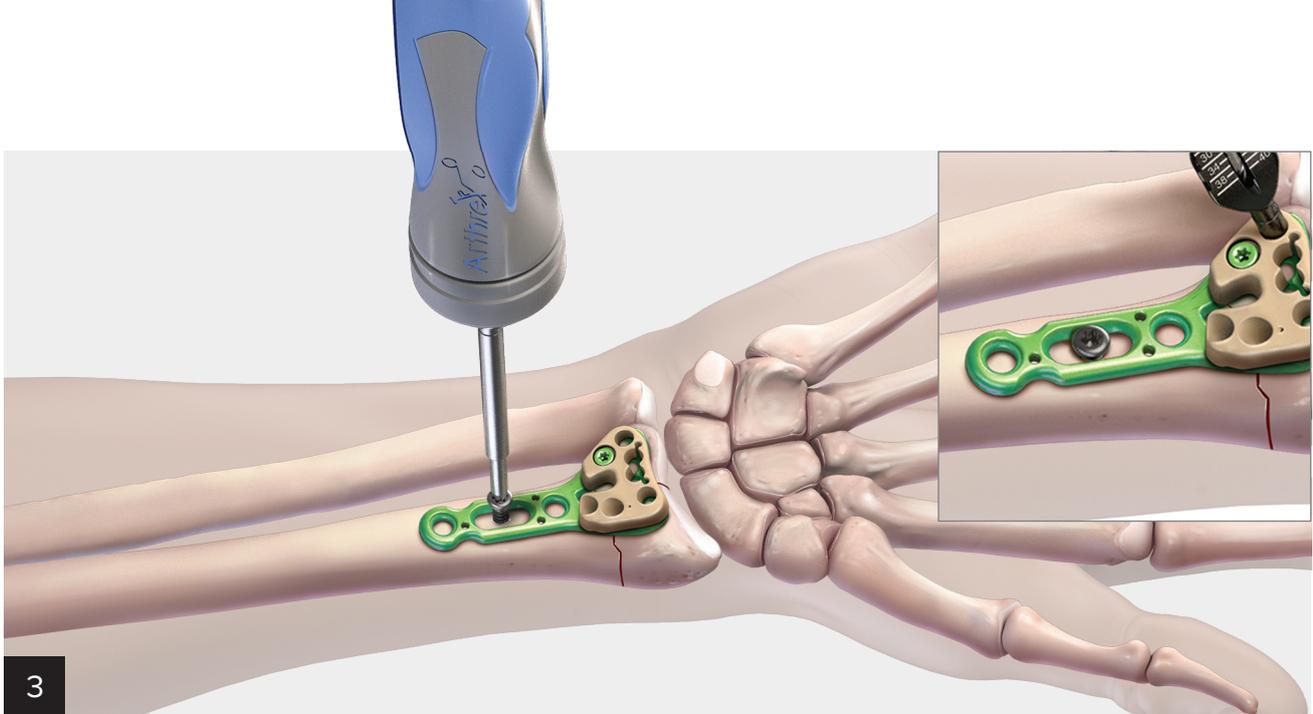


Reduce the fracture manually and evaluate under fluoroscopy. Release the brachioradialis subperiosteally from its radial and distal insertion as needed to facilitate reduction of the fracture site. Transstyloid K-wires may be used for provisional fixation of the fracture. The plate is designed to sit 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.



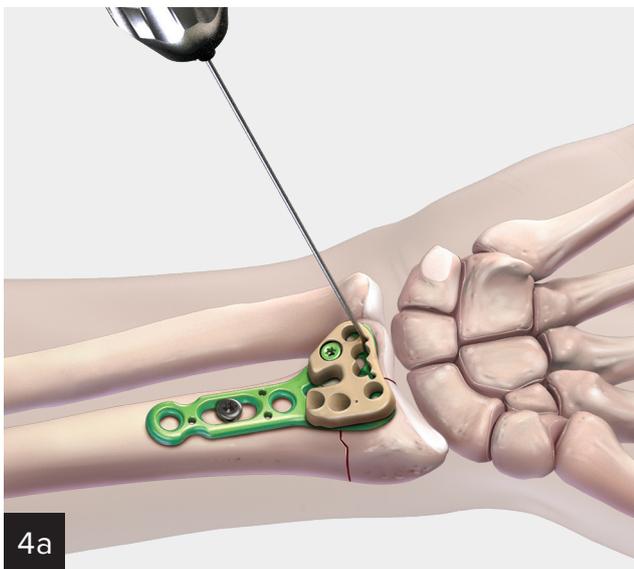
Once the appropriately sized plate is selected, attach the corresponding PEEK aiming guide using the set screw. This may be done prior to plate placement for ease of attachment on the back table prior to insertion.

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.



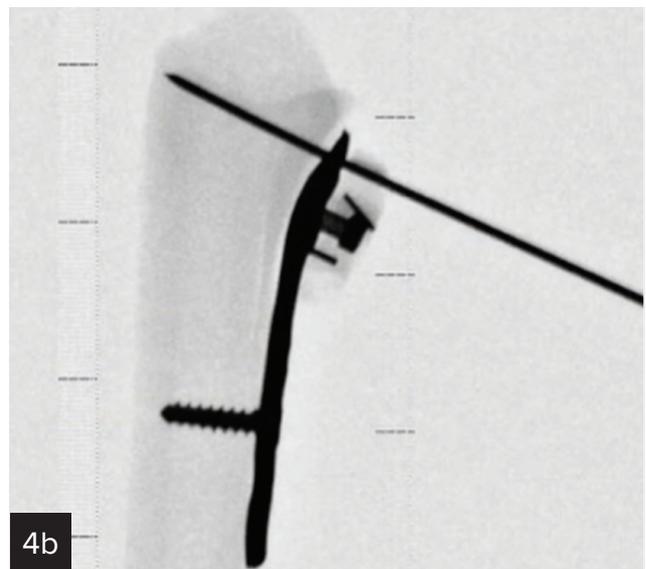
3

Using the appropriate drill bit, insert a 2.4 mm or a 3.5 mm nonlocking screw into the oblong hole on 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.



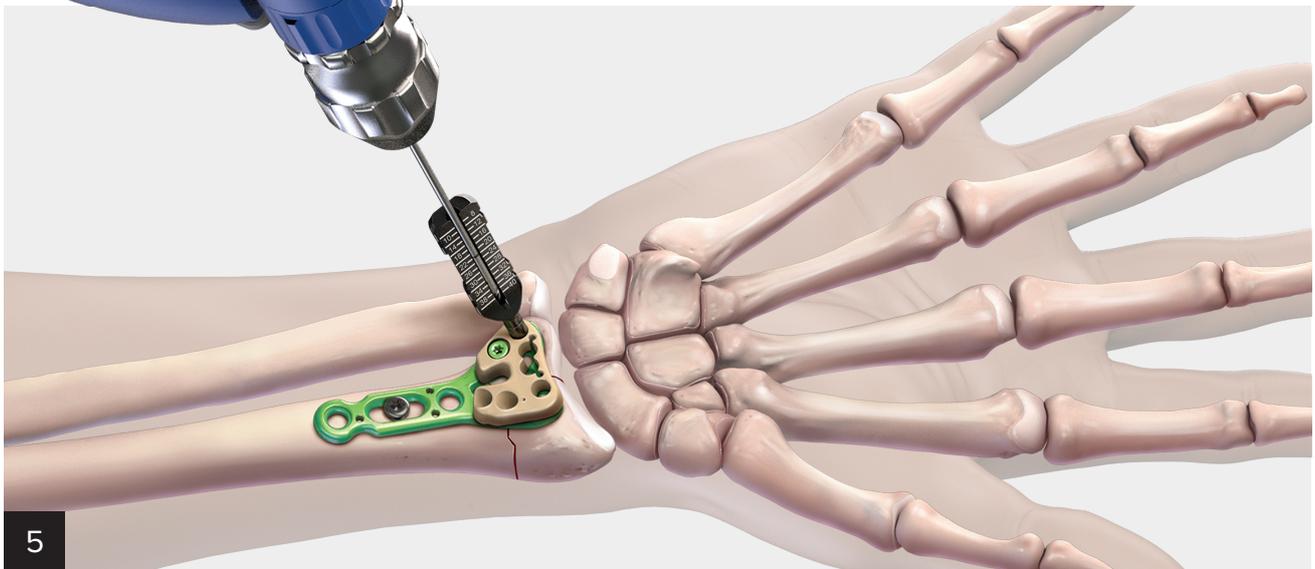
4a

K-wire holes in the distal aspect of the plate accept 1.35 mm or 0.054 in 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.



4b

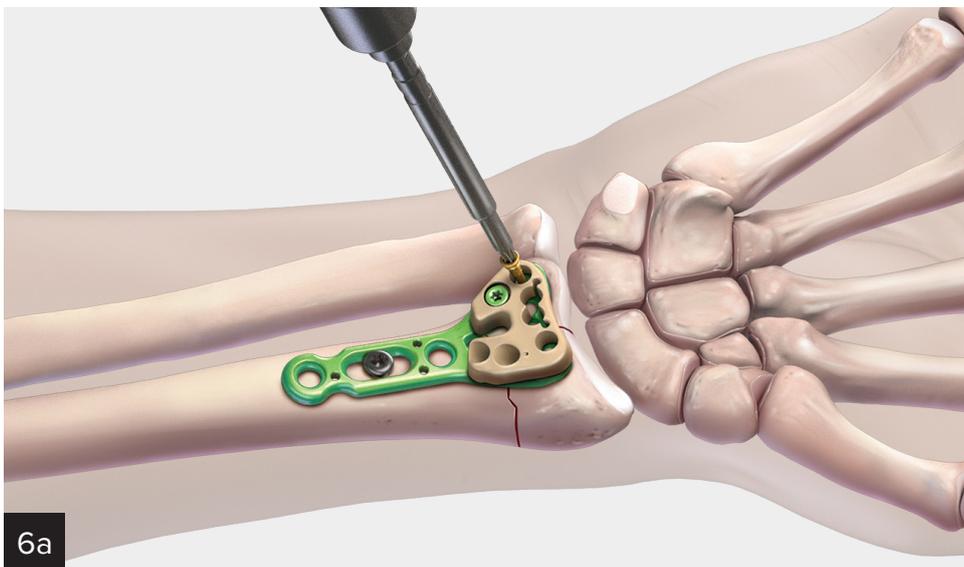
Verify K-wire placement using multiple fluoroscopic views to ensure that the fixed angle trajectory is proximal to the articular surface. If these distal K-wires are not in the joint, the fixed angle screws will not be either. If adjustments are necessary, remove the K-wire and loosen the nonlocking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



5

Once proper plate placement is achieved and verified under fluoroscopy, place the drop-in drill guide into the PEEK aiming guide and use the 1.7 mm graduated drill bit to drill 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.

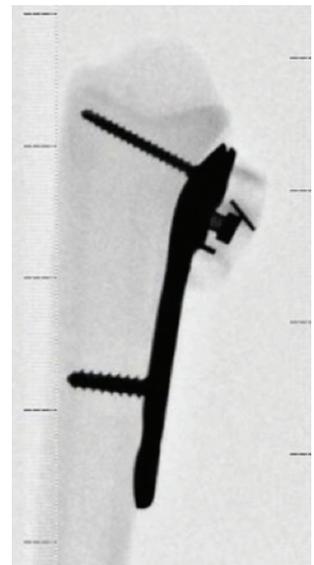


6a

Once the appropriate screw length is selected, choose either a 2.4 mm KreuzLock™ locking compression screw, 2.4 mm locking VAL screw, nonlocking cortical LPS screw, or smooth shaft VAL near cortex screw. Use the torque-limiting handle to insert the 2.4 mm screws. This ensures proper tensioning and fixation to the plate. Do not overtighten screws. Stop once screw is seated and resistance is met. Confirm proper placement of screw with fluoroscopic imaging.

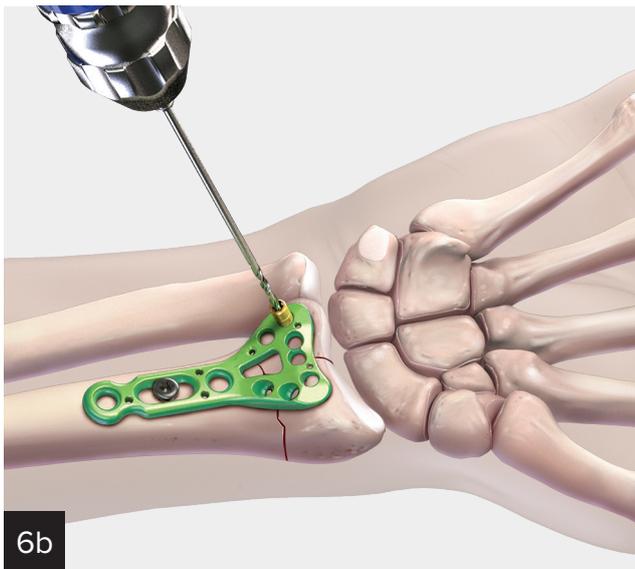
Note: Gold 2.4 mm VAL screws are used for both fixed-angle and VAL constructs.

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



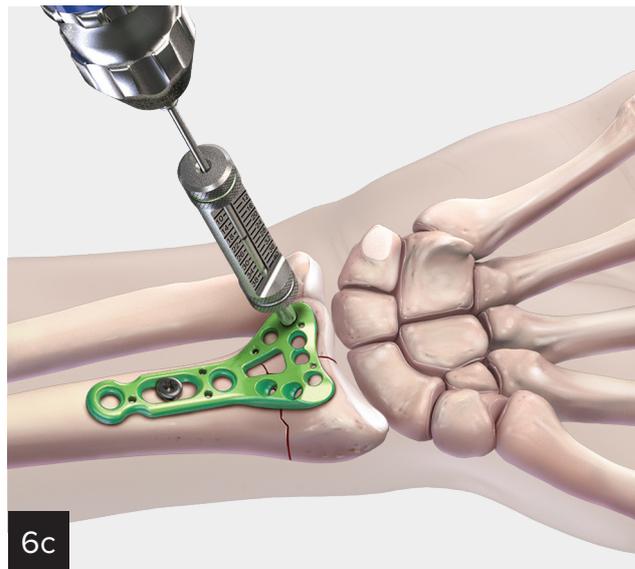
Additional Screw Aiming Options

Several alternative aiming options are available.



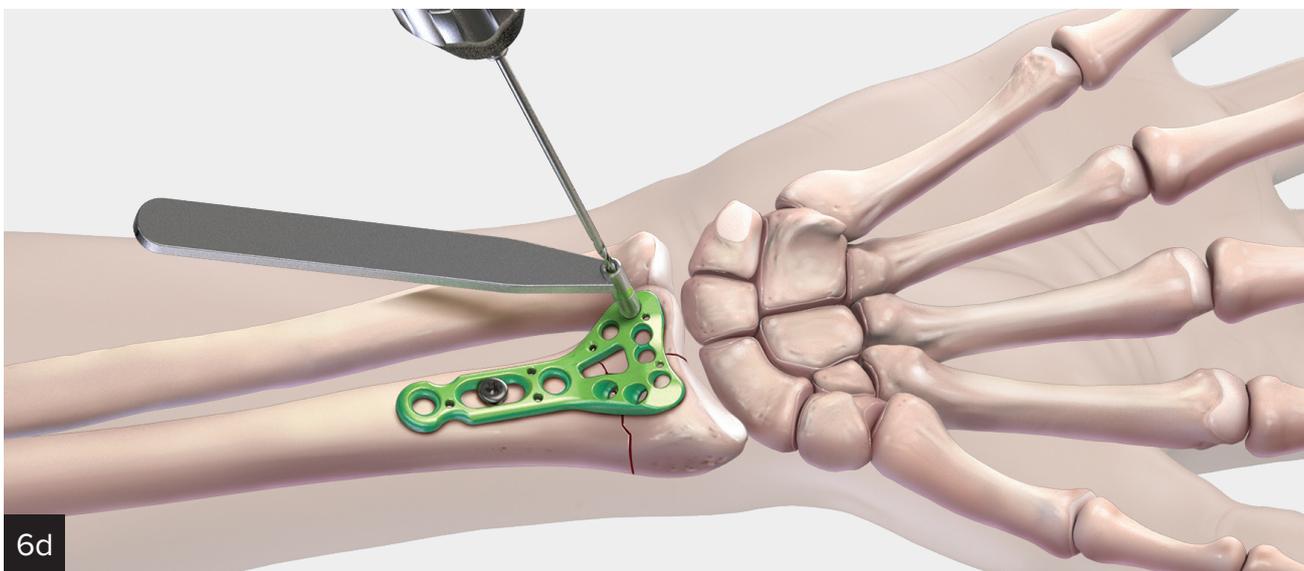
1.7 mm Drill Sleeve Option

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

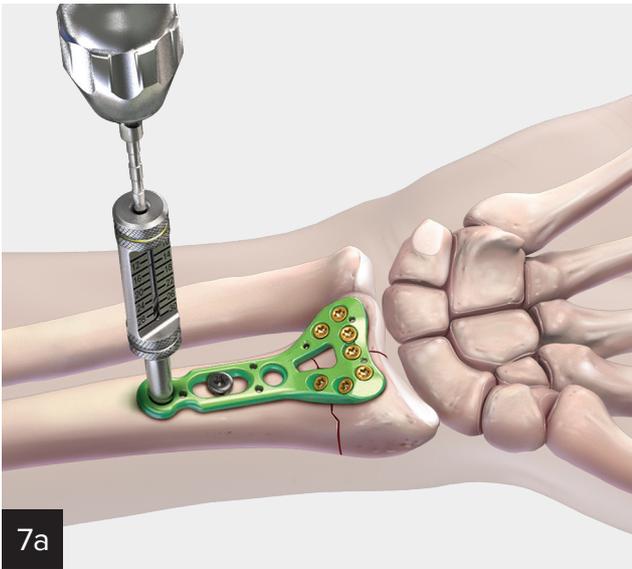
A standard threaded drill guide is also available for the head and is graduated to the laser marked 1.7 mm drill bit. If desired, the measuring probe can be used after drilling to obtain a more controlled and precise measurement.



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. Press the 2.4 mm variable angle drill guide firmly into the plate hole; 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.

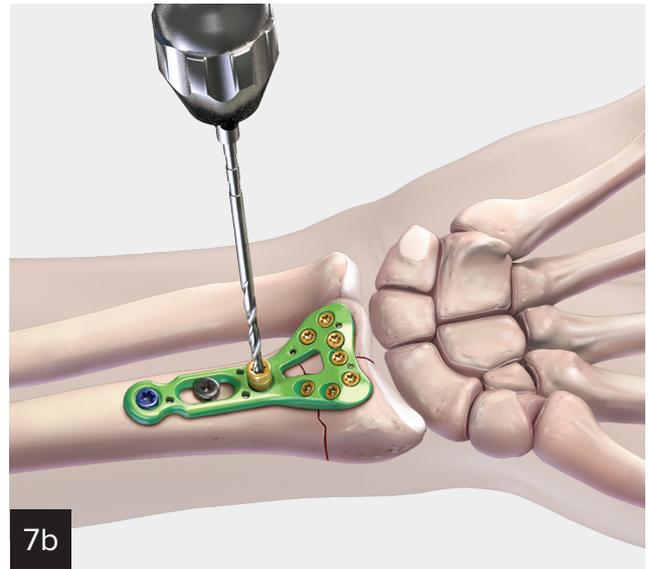
After drilling both cortices, remove the guide and measure the screw depth with the appropriate sliding depth guide.



7a

Final Shaft Fixation

Once the distal screws are placed to stabilize the fracture fragments, thread the locking drill guide for the 2.4 mm or 3.5 mm locking screws into the remaining locking shaft holes.



7b

Drill Sleeves

In addition to the threaded 3.5 mm locking drill guide, individual drill sleeves are available for the 2.4 mm or 3.5 mm locking screws as well. These can be screwed into the appropriate locking shaft holes and drilled with the appropriate drill bit.

Remove the drill sleeves with the driver and measure screw depth with the appropriate sliding depth guide.



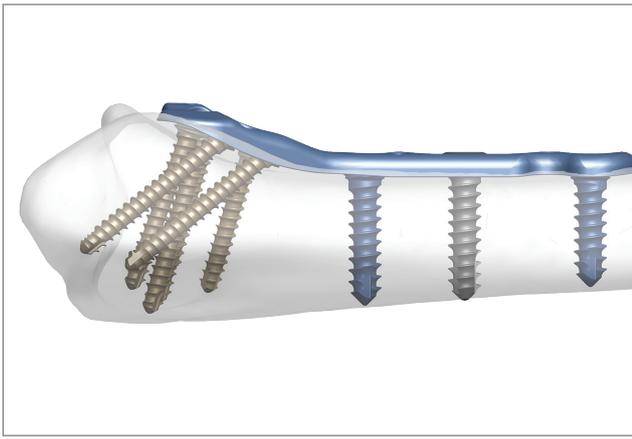
Plate with variable angle guide



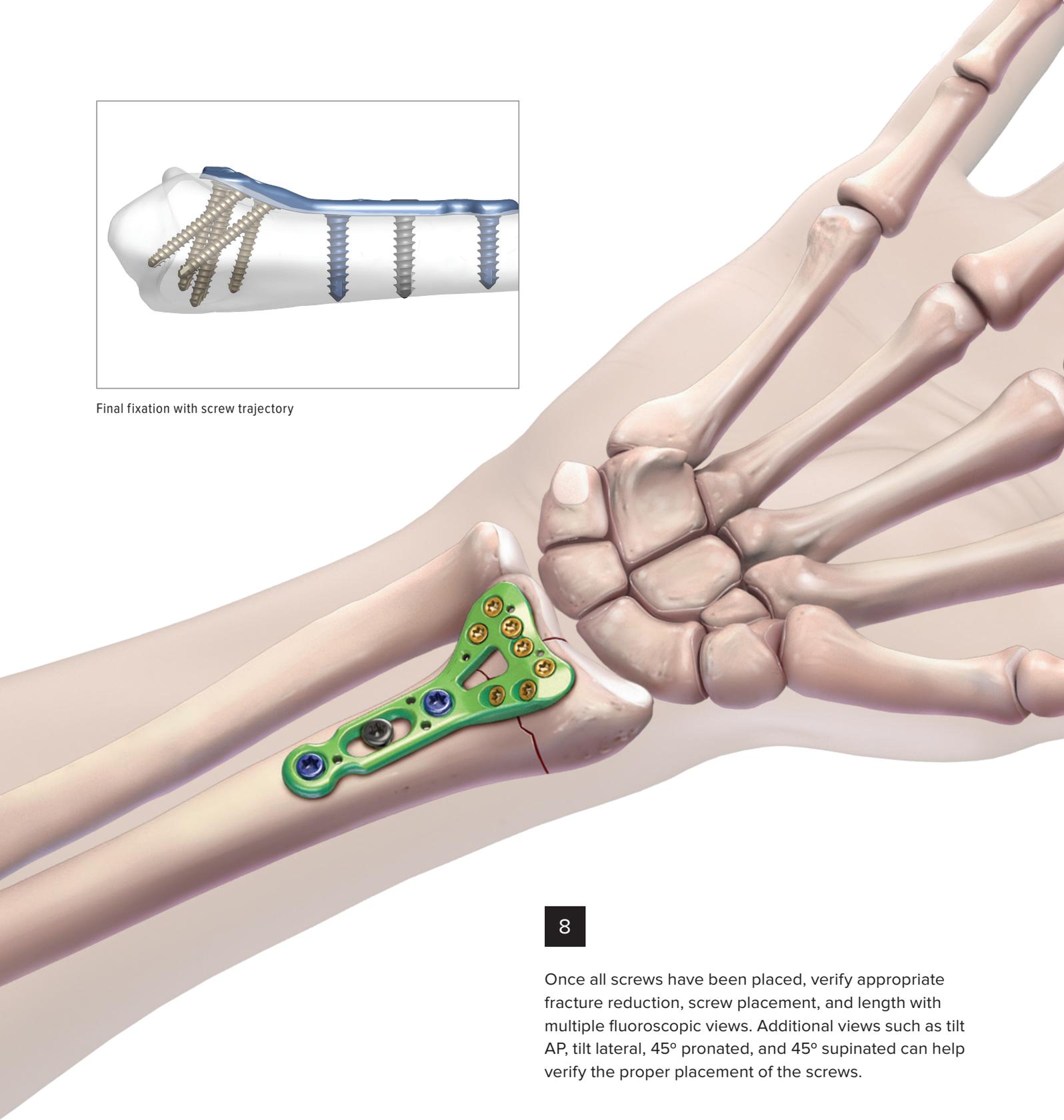
Plate with drill sleeves



Plate with PEEK aiming guide



Final fixation with screw trajectory



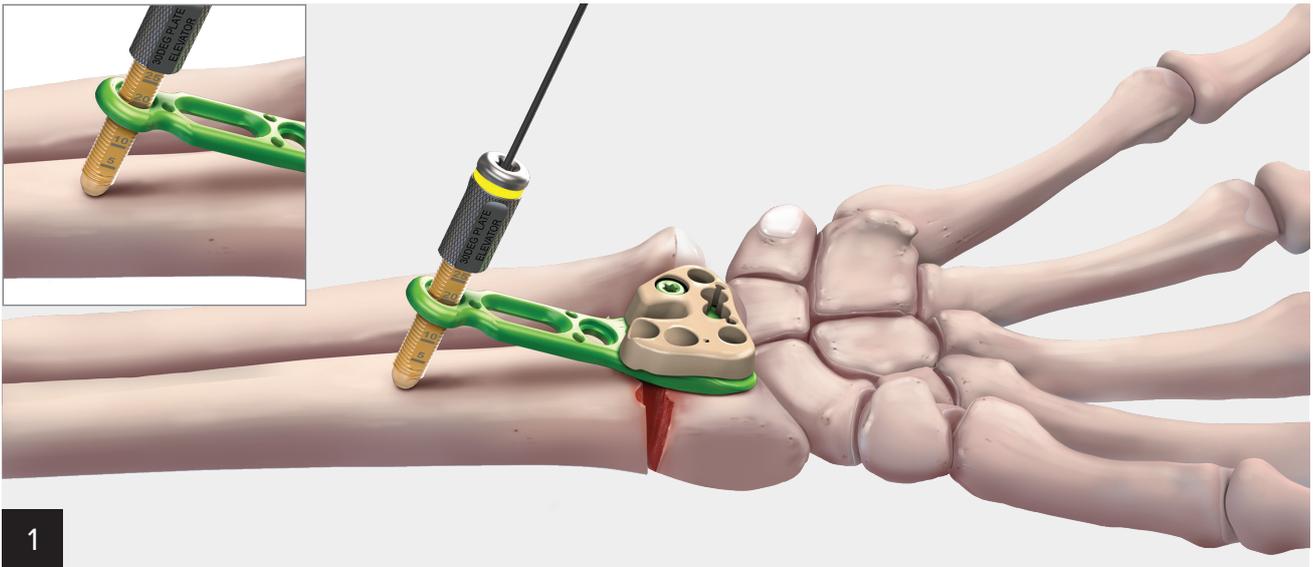
8

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.

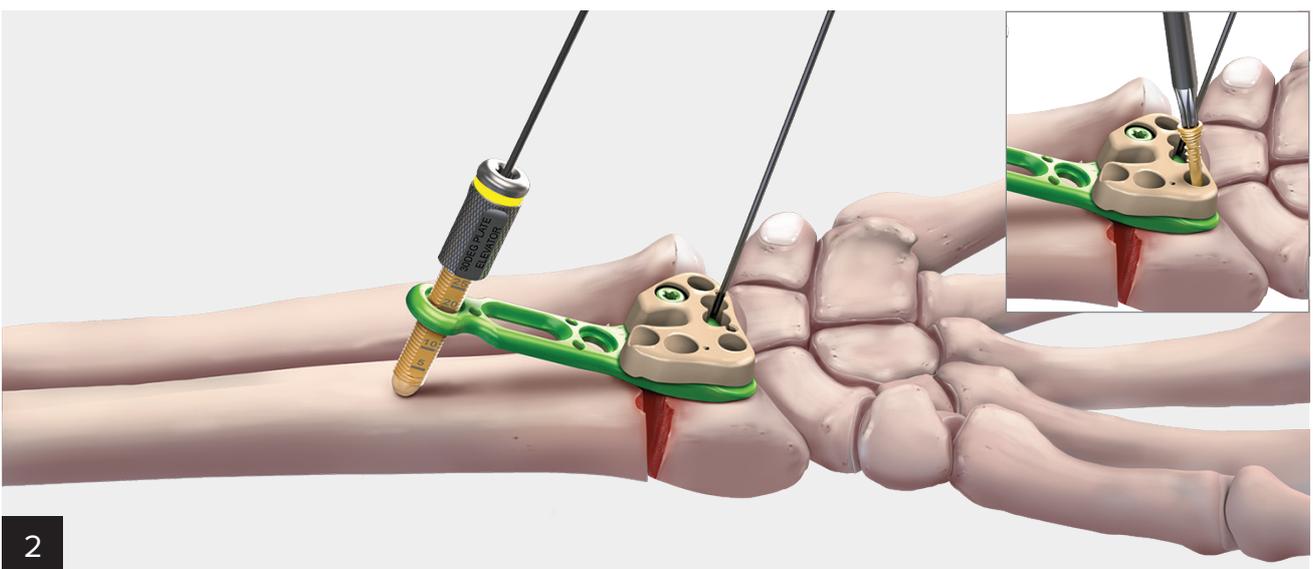
2.4 mm/3.5 mm Volar Plate Alternative Technique: Fracture Reduction

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 can only be used in the 2.4 mm/3.5 mm volar plate. 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.

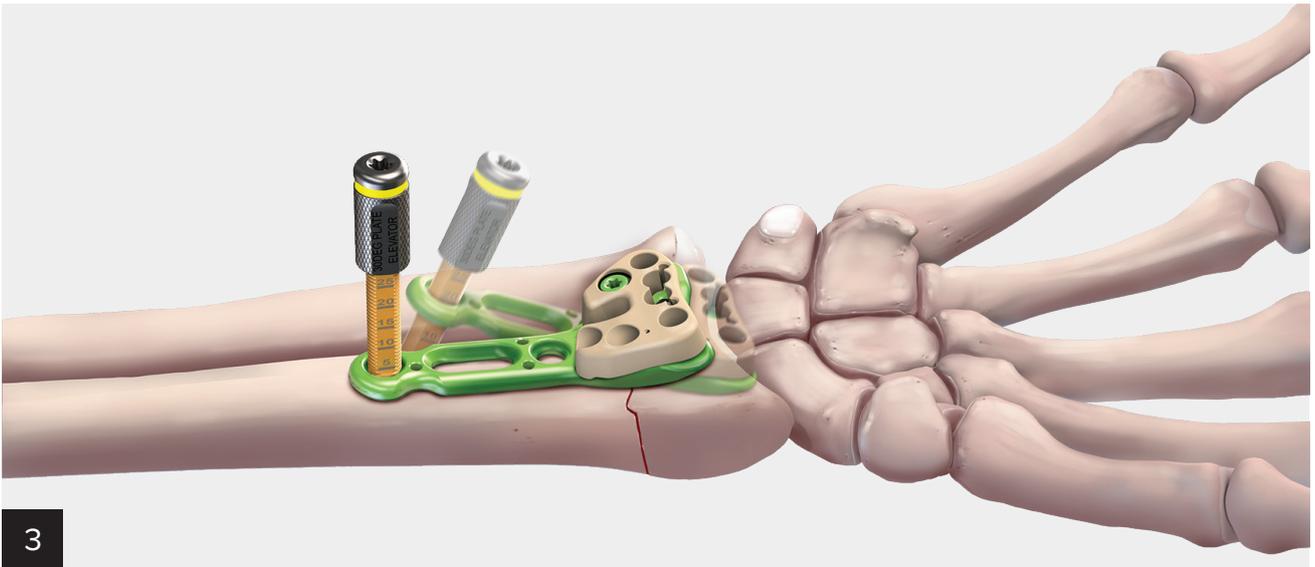


The plate elevator can be threaded by hand until the desired height is achieved or the T15 driver can be used. The plate elevator is also cannulated to accept a 1.35 mm K-wire to aid in stabilizing the plate once desired height is achieved.



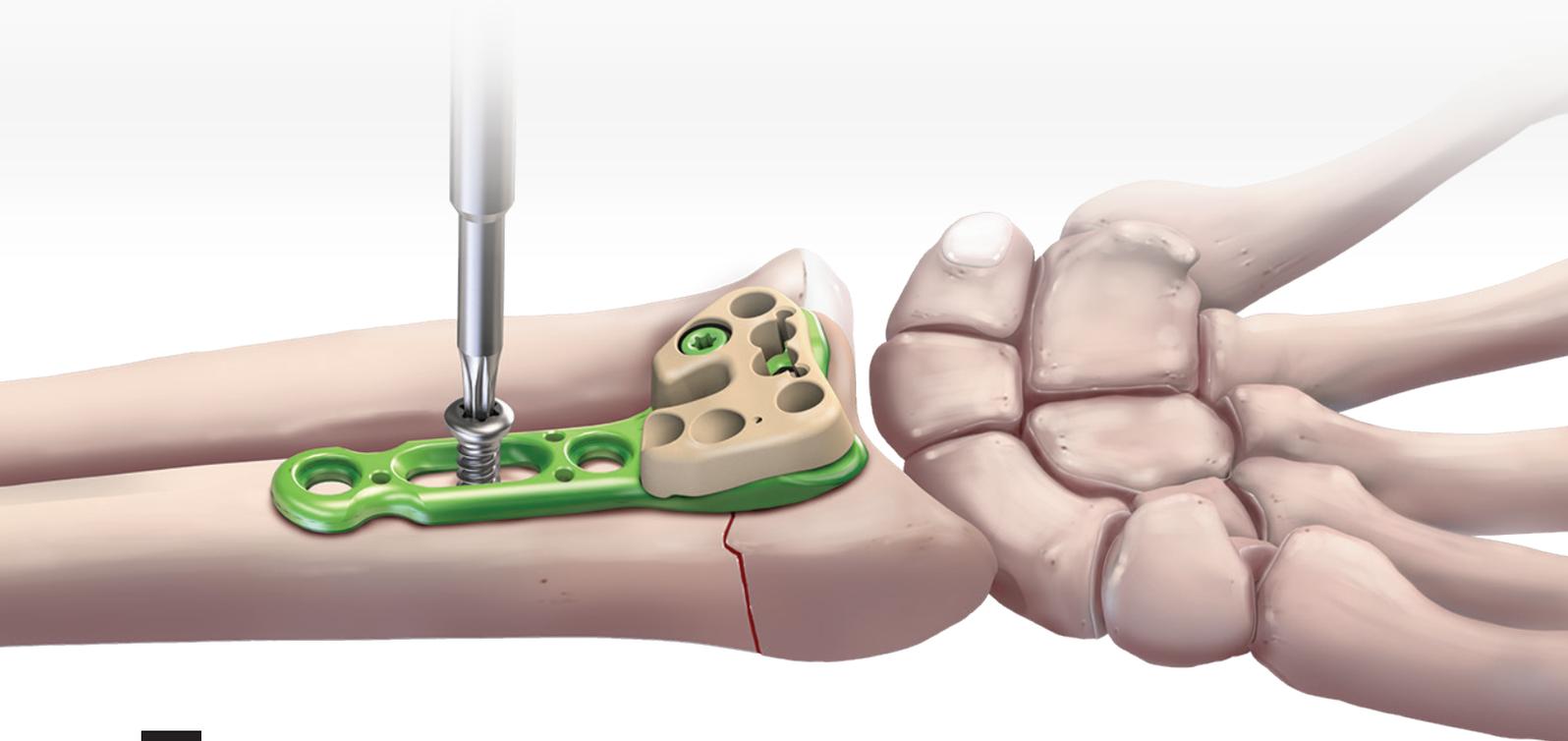
Once the plate has been lifted and is flush with the dorsally displaced fracture fragments, the distal K-wire holes can be used to assess screw placement in relation to the joint surface as described previously.

The 2.4 mm locking screws can then be placed into the plate using the methods described previously.



3

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. Next, bring the plate back to the radial shaft to achieve reduction of the distal fracture fragments.



4

After obtaining reduction, 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)

Product Description	Item Number
Wrist plating system case	AR-8916C

Plates

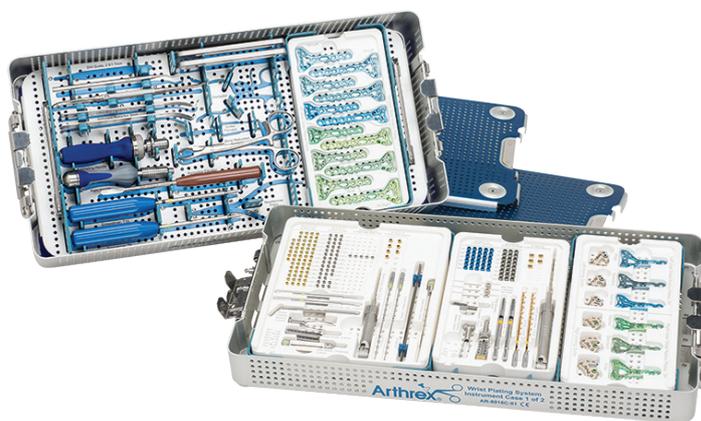
Product Description	Item Number
2.4 mm/3.5 mm Plates	
Volar distal radius plate, narrow, right, 3H	AR-8916VNR-03
Volar distal radius plate, narrow, left, 3H	AR-8916VNL-03
Volar distal radius plate, narrow, right, 5H	AR-8916VNR-05
Volar distal radius plate, narrow, left, 5H	AR-8916VNL-05
Volar distal radius plate, 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
2.4 mm Plates	
Volar distal radius plate, narrow, right, 3H	AR-8924VNR-03
Volar distal radius plate, narrow, left, 3H	AR-8924VNL-03
Volar distal radius plate narrow, right, 5H	AR-8924VNR-05
Volar distal radius plate, narrow, left, 5H	AR-8924VNL-05
Volar distal radius plate, standard, right, 3H	AR-8924VSR-03
Volar distal radius plate, standard, left, 3H	AR-8924VSL-03
Volar distal radius plate, standard, right, 5H	AR-8924VSR-05
Volar distal radius plate, standard, left, 5H	AR-8924VSL-05
Volar distal radius plate, wide, right, 3H	AR-8924VWR-03
Volar distal radius plate, wide, left, 3H	AR-8924VWL-03
Volar distal radius plate, wide, right, 5H	AR-8924VWR-05
Volar distal radius plate, wide, left, 5H	AR-8924VWL-05
Sterile 2.4 mm/3.5 mm Plates, longer shafts	
Volar distal radius plate, narrow, right, 7H	AR-8916VNR-07S
Volar distal radius plate, narrow, left, 7H	AR-8916VNL-07S
Volar distal radius plate, narrow, right, 9H	AR-8916VNR-09S
Volar distal radius plate, narrow, left, 9H	AR-8916VNL-09S
Volar distal radius plate, standard, right, 7H	AR-8916VSR-07S
Volar distal radius plate, standard, left, 7H	AR-8916VSL-07S
Volar distal radius plate, standard, right, 9H	AR-8916VSR-09S
Volar distal radius plate, standard, left, 9H	AR-8916VSL-09S
Fragment Specific Plating	
2.4 mm 2H L-Plate, Ti, right, 5H	AR-8952ML-05R
2.4 mm 2H L-Plate, Ti, left, 5H	AR-8952ML-05L
Wrist spanning plate, Ti	AR-8916SPN
2.4 mm Radial styloid plate, 5H	AR-8916RSTY-05
Volar hook plate, 4H	AR-8916VH-04
Volar hook plate, 6H	AR-8916VH-06
Dorsal distal radius plate, standard, right, 4H	AR-8916DSR-04
Dorsal distal radius plate, standard, left, 4H	AR-8916DSL-04
Dorsal distal radius plate, narrow, right, 4H	AR-8916DNR-04
Dorsal distal radius plate, narrow, left, 4H	AR-8916DNL-04
Ulnar styloid plate	AR-8956-01

Screws

Product Description	Item Number
2.4 mm Screws	
VAL screw, Ti, locking, 2.4 mm × 8.0 mm – 34 mm (2.0 mm increments)	AR-8724V-08 – 34
KreuLock™ Compression Screw, Ti, 2.4 mm × 10 mm – 40 mm (2.0 mm increments)	AR-8724VCL-10 – 40
VAL near cortex screw, Ti, locking, 2.4 mm × 8.0 mm – 34 mm (2.0 mm increments)	AR-8916VNC-08 – 34
Cortex screw, Ti, 2.4 mm × 8.0 mm – 34 mm (2.0 mm increments)	AR-8916CX24-08 – 34
3.5 mm Screws	
Locking screw, Ti, 3.5 mm × 10 mm – 20 mm (2.0 mm increments)	AR-8735L-10 – 20
Cortical LPS screw, Ti, 3.5 mm × 10 mm – 14 mm (1.0 mm increments)	AR-8935-10 – 14
Cortical LPS screw, Ti, sterile, 3.5 mm × 15 mm	AR-8935-15
Cortical LPS screw, Ti, 3.5 mm × 16 mm – 20 mm (2.0 mm increments)	AR-8935-16 – 20

Disposables

Product Description	Item Number
Guidewire w/ trocar tip, 1.35 mm	AR-8943-01
BB-Tak, 1.6 mm	AR-13226
BB-Tak	AR-13266-08 – 30



Wrist Plating System (AR-8916S)

Aiming Guides

Product Description	Item Number
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

Product Description	Item Number
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 × 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
Torque limiting screw driver for 2.4 mm locking screws	AR-8916TL-01

Instrumentation for 3.5 mm Locking and Cortical Screws

Product Description	Item Number
Drill guide, threaded, 3.5 mm × 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 × 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

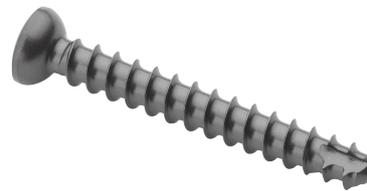
Product Description	Item Number
Plate bending iron	AR-8916-10
Palm handle, QC	AR-8916-25
Ratcheting handle, QC	AR-8950RH
Screw holding sleeve, 2.0/2.4 mm	AR-8920H
Screw holding sleeve, 2.7, 3.5, and 4.0 mm	AR-8943-11
Freer elevator	AR-8943-19
Sharp hook	AR-8943-21
Hohmann retractor, 8.0 mm	AR-13210
Hohmann 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



2.4 mm KreuLock™
Compression Screw
(AR-8724VCL-20)



2.4 mm VAL Screw
(AR-8724V-18)



2.4 mm Cortex Screw
(AR-8916CX24-18)



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



3.5 mm Locking Screw
(AR-8735L-18)



3.5 mm Cortical Screw
(AR-8935-18)

Supporting Products

Sterile Distal Radius Plating System

The Sterile Distal Radius Plating System provides orthopedic surgeons with the Distal Radius System in a sterile, ready-to-use convenience kit.

The sterile convenience kit includes a titanium 2.4 volar plate, 2.4 locking and nonlocking screws, K-wires, 1.7 drill bit, measuring probe, screwdriver, and drill guide.

2.4 mm Volar Distal Radius Plate Kit Convenience Packs

Product Description	Item Number
Distal radius plate sterile implant kit 2.4 mm volar DR plate, narrow, right, 3H, KreuLock™ screws	AR-8924VNR-03CLDS
Distal radius plate sterile implant kit 2.4 mm volar DR plate, narrow, left, 3H, KreuLock screws	AR-8924VNL-03CLDS
Distal radius plate sterile implant kit 2.4 mm volar DR plate, standard, right, 3H, KreuLock screws	AR-8924VSR-03CLDS
Distal radius plate sterile implant kit 2.4 mm volar DR plate, standard, left, 3H, KreuLock screws	AR-8924VSL-03CLDS

2.4 mm Volar Distal Radius Trial Plates

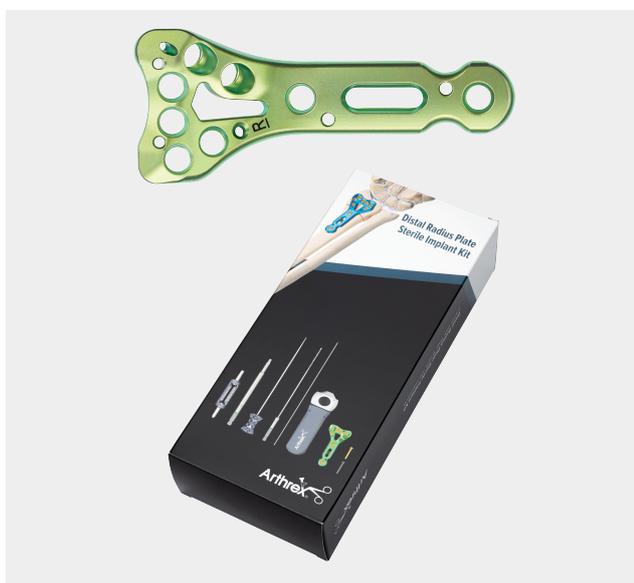
Product Description	Item Number
2.4 Volar distal radius trial plates, sterile	AR-8924VT-S

2.4 mm Volar Distal Radius Removal Driver

Product Description	Item Number
2.4 Volar distal radius system removal driver, sterile	AR-8924VD-S

Sterile Screws (Individually Packed)

Product Description	Item Number
VAL screw, 2.4 mm, sterile	AR-8724V-xxS
Nonlocking cortical screw, 2.4 mm, sterile	AR-8916CX24-xxS
Spare screw caddy	DS-8924BX



Small External Fixator

The Arthrex Small External Fixation (“Ex-Fix”) System was designed to give surgeons a versatile solution for small-bone fixation. The system consists of 2.0 mm and 3.0 mm pins with varying thread lengths and 5.0 mm carbon fiber rods. Single- and multi-pin clamps allow for flexibility while creating constructs.

Product Description	Item Number
Carbon fiber rods	
Carbon fiber rod, 5.0 mm × 50 mm to 300 mm	1181-050 – 300
Clamps	
5.0 mm small external fixation clamp	1400-000
2-Pin small multi-pin clamp	1406-000
Multi-pin clamp extension	1407-000
3-Pin small multi-pin clamp	1409-000
Threaded half pins	
2.0 mm × 10 mm × 55 mm and 75 mm	1410-055 – 075
2.0 mm × 15 mm × 55 mm and 75 mm	1411-055 – 075
2.0 mm × 20 mm × 75 mm	1412-075
3.0 mm × 10 mm × 75 mm	1414-075
3.0 mm × 15 mm × 75 mm and 100 mm	1415-075 – 100
3.0 mm × 20 mm × 75 mm and 140 mm	1416-075 – 140
3.0 mm × 25 mm × 75 mm and 140 mm	1417-075 – 140
Accessories	
Bent post, multi-pin clamp	1421-000
Straight post, multi-pin clamp	1422-000
Bolt, multi-pin clamp	1423-000
Small external fixation system	1425-000
Parallel fixation nut	1428-000
1.5 mm guide pin	0109-150
Pin caps (4 pack)	1426-000
Calibrated drill, AO style, 1.5 mm × 110 mm	4001-000
Calibrated drill, AO style, 2.0 mm × 110 mm	4002-000
Drill guide, 1.5 mm to 2 mm	0343-000
Wrench, AO, 3/8 in - 3/16 in	5007-000
T-handle wrench, 3/16 in	5009-000
T-handle wrench, 3/8 in	5013-000
Multi-pin clamp drill guide	0357-000
Thread-in sleeve multi-pin clamp drill guide	0358-000





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. Postoperative management is patient-specific and dependent on the treating professional's assessment. Individual results will vary and not all patients will experience the same postoperative activity level or outcomes.

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US patent information