OrthoLine™ Radial Fracture System

Surgical Technique

Arthrex®
Vet Systems

OrthoLine™ Radial Fracture System

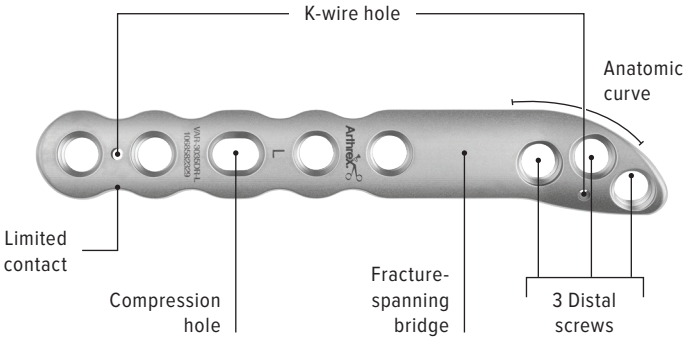
Introduction

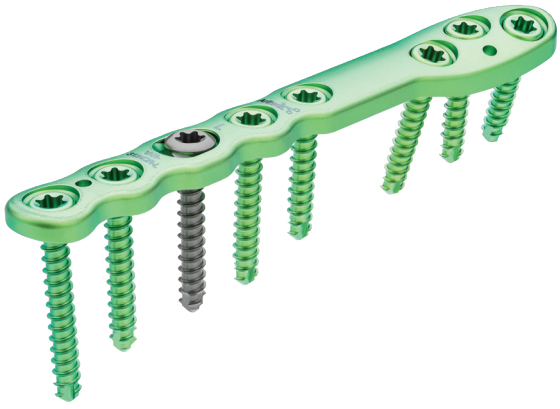
The Arthrex OrthoLine radial fracture plate system includes a range of sizes from 1.6 mm to 3.5 mm. Each plate size is anatomically contoured to mimic the anatomy of patients within a given size range. The plate includes distal screw trajectories. The proximal screw trajectories align centrally within the bone. This plate is designed to minimize soft tissue irritation. Additionally, the radial plate includes a fracture-spanning bridge and a compression hole, which allows for compression across the fracture site. This plate is designed for a cranial-lateral placement can be used with a left plate on the right bone and vice versa.

Features and Benefits

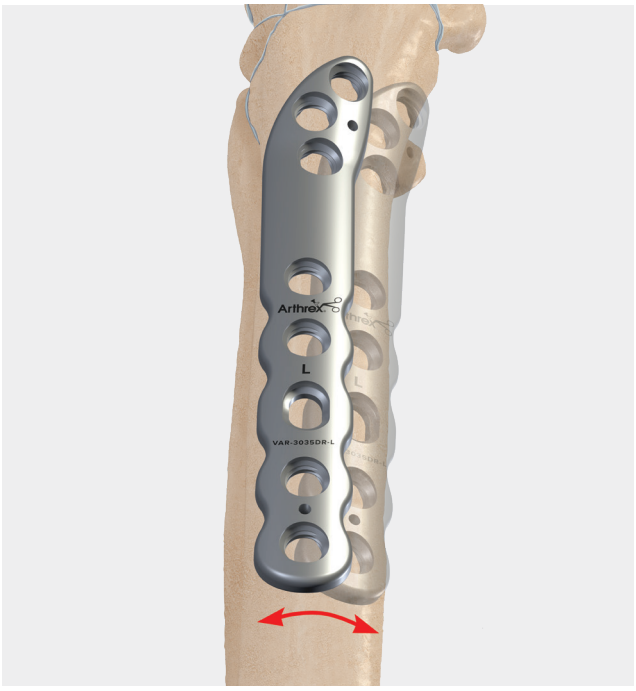
- Distal screw trajectories
- Proximal screw trajectories to align centrally in the bone
- Designed for distal radial fractures
- Anatomic plate design with left and right options
- High screw density where needed
- Tapered design to avoid soft tissue irritation
- Compression hole
- Fracture-spanning bridge
- 2 placement options

Anatomic Design

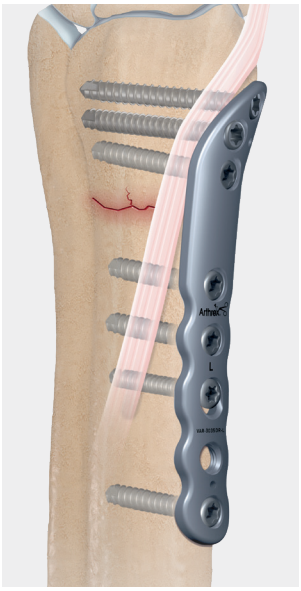




Cranial-Medial Applications



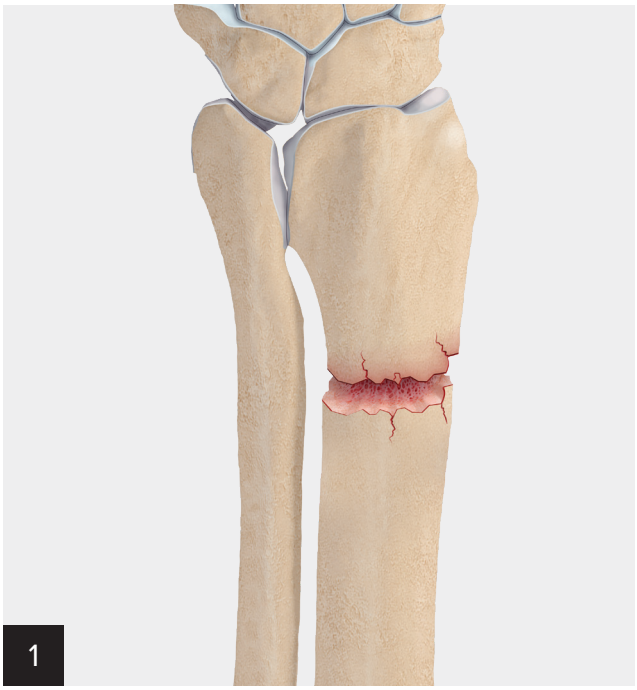
The design of the distal radial plate uses a cranial-medial placement. The plate can be placed in varying locations on the cranial-medial aspect of the bone. For a cranial-lateral placement of the plate, the left plate should be applied to the right limb, and the right plate should be applied to the left limb.

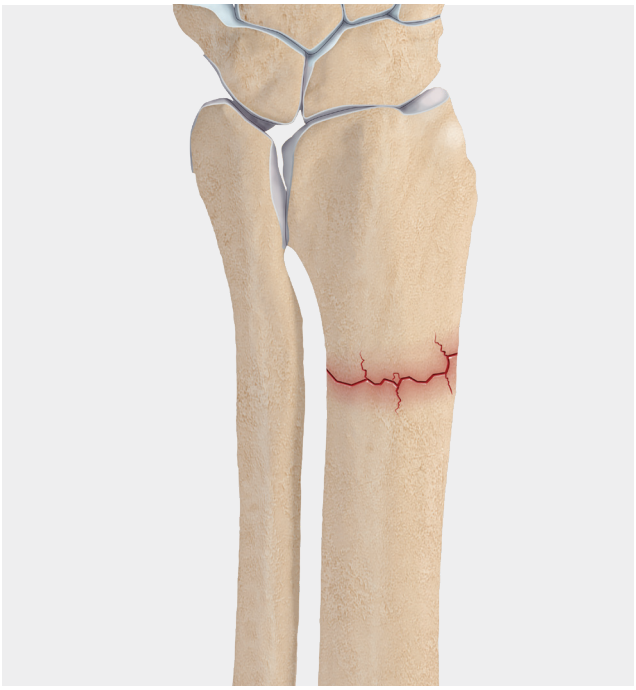


Cranial-medial placement (left plate)

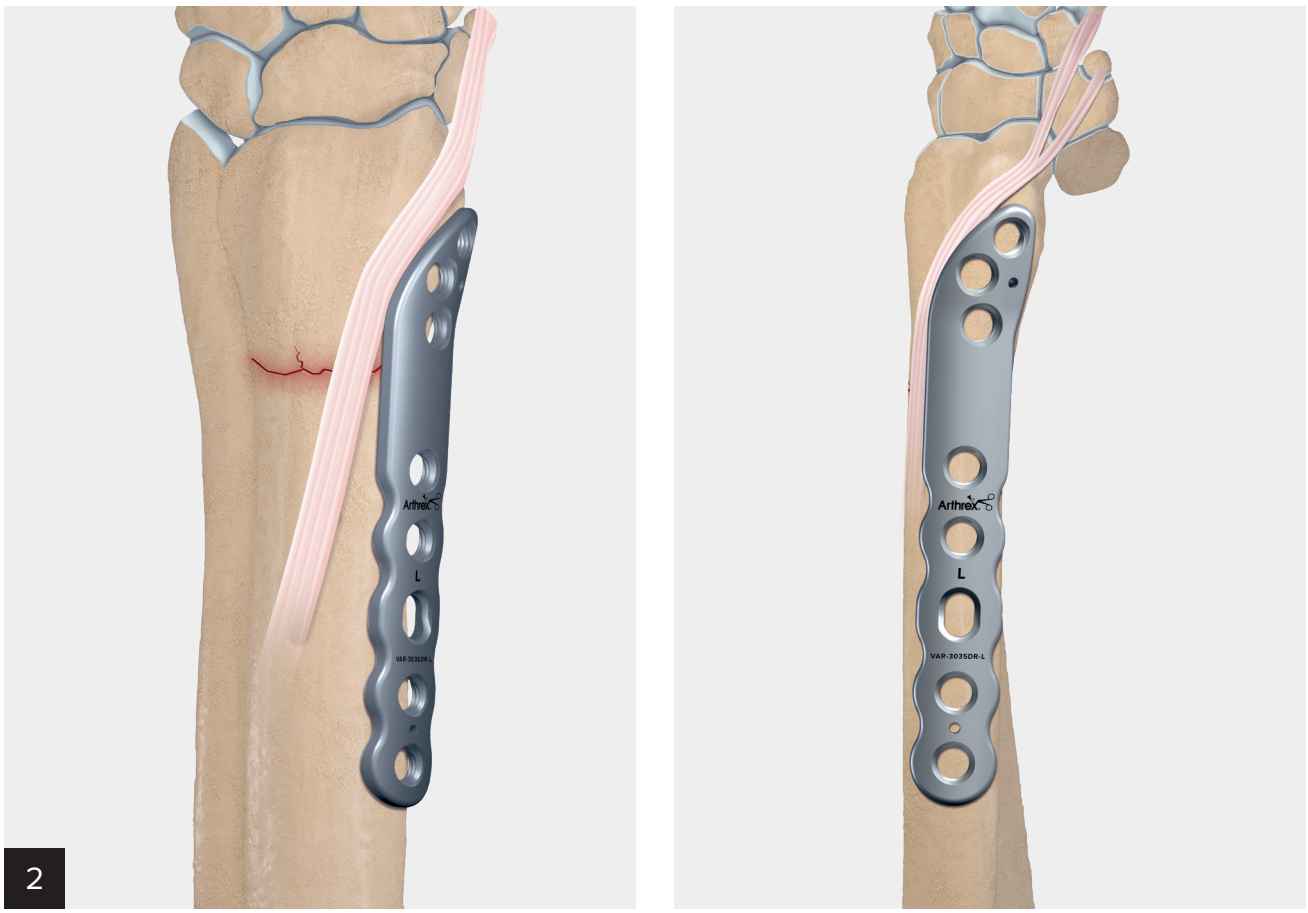
Cranial-lateral placement (right plate)

Surgical Technique



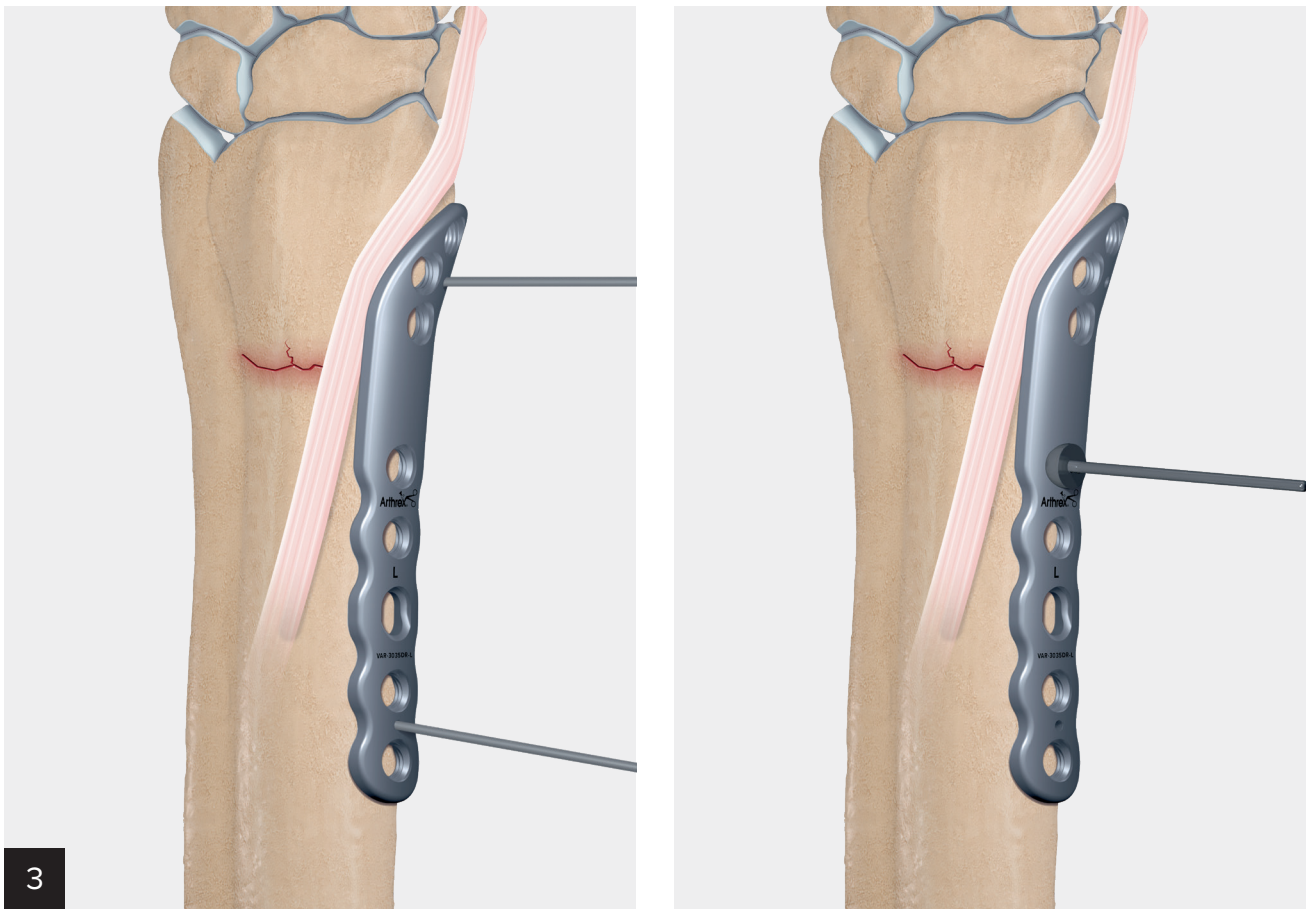


Create a cranial-medial approach to the radius and reduce the fracture to create proper alignment.

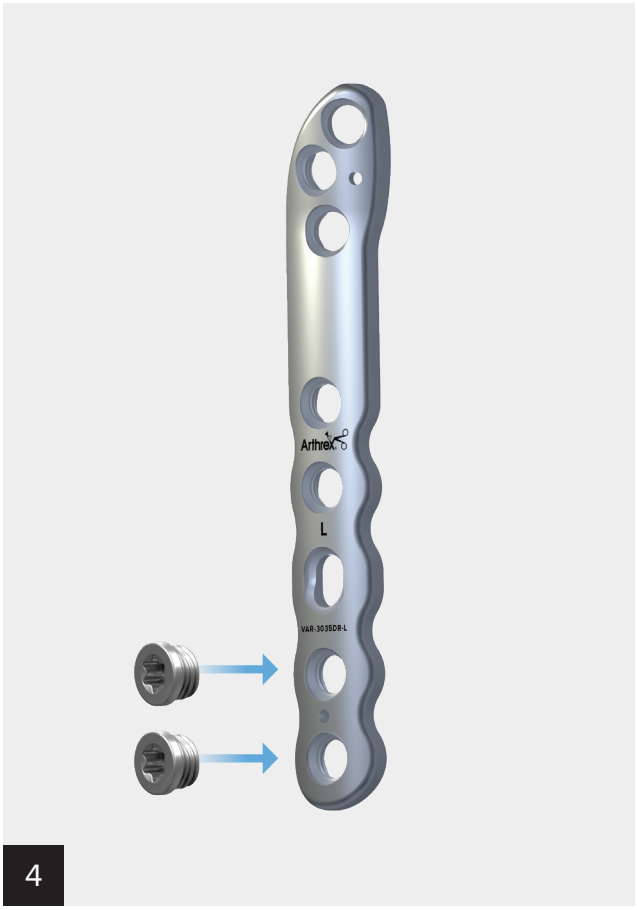


2

The plate is placed on the cranial-medial surface of the radius, adjusted in its proximal to distal orientation, and rotated to best fit the radius. The distal end of the plate is meant to abut the abductor pollicis longus tendon at the level of the extensor groove for this tendon on the cranial-medial aspect of the radius. A tenotomy is typically not required with this placement. The bridge of the plate should span the fracture line.



The plate may be temporarily affixed to the bone using multiple methods. For temporary fixation, K-wire holes, K-wires in conjunction with cannulated bending plugs, and/or the application of a threaded BB-Tak in the center of a universal hole can be used.



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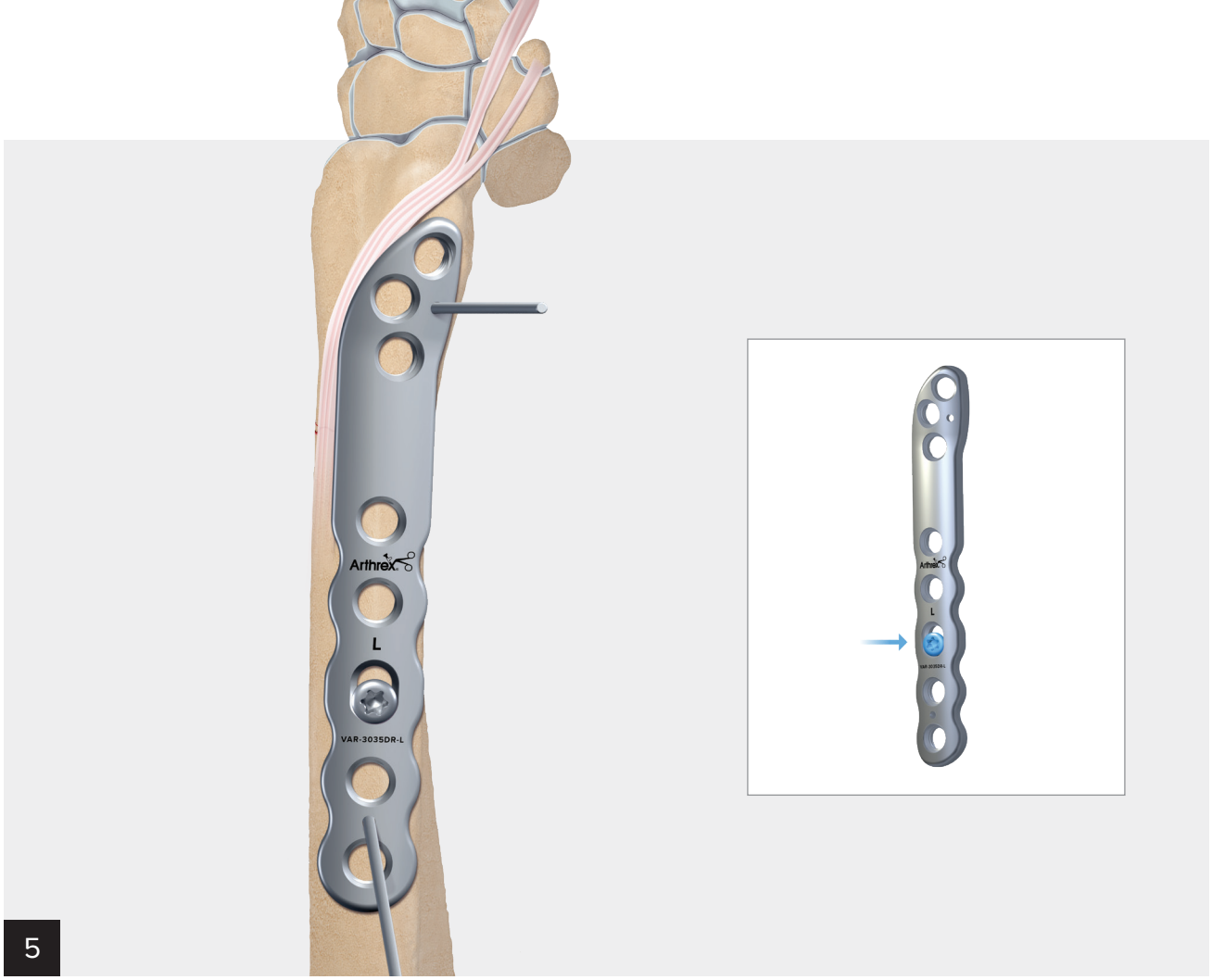
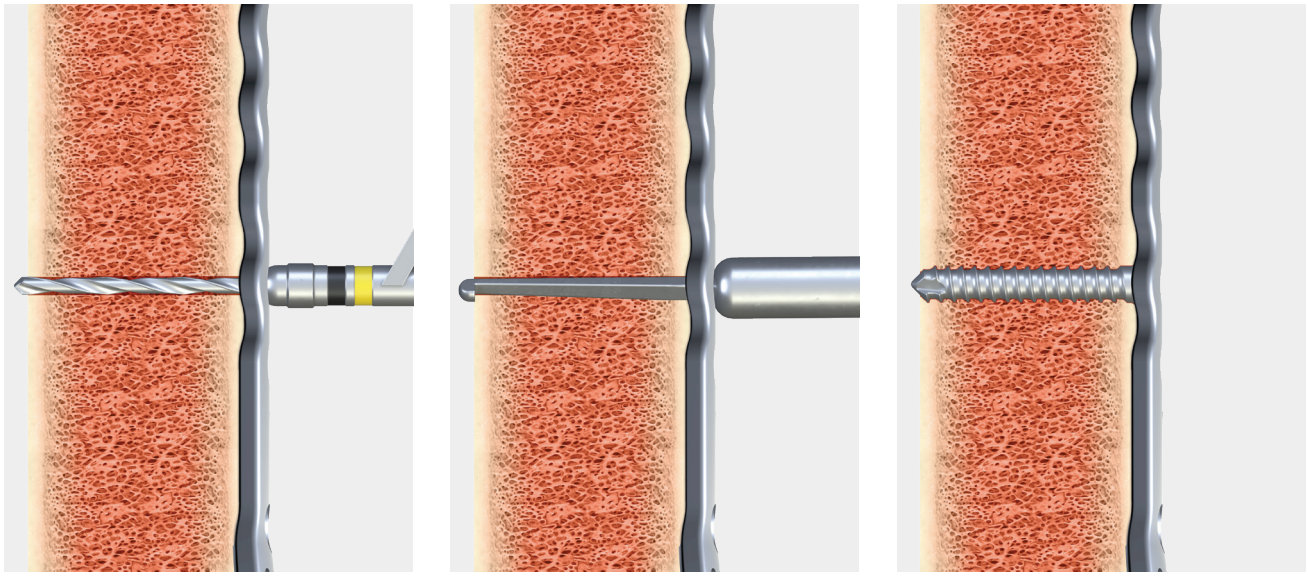
Using the appropriate screwdriver, place cannulated threaded bending plugs into the locking screw holes where the plate will be contoured. Contour the plate as necessary using bending irons or another form of plate benders, replicating the requirements in the previous step. Contouring can modify the screw trajectories, which can result in intra-articular screw placement distally.

To bend the tip of the plate, use the fork end of the bending iron. Once the contouring is complete, the bending plugs can be removed or used in conjunction with the appropriate size K-wire for temporary fixation.



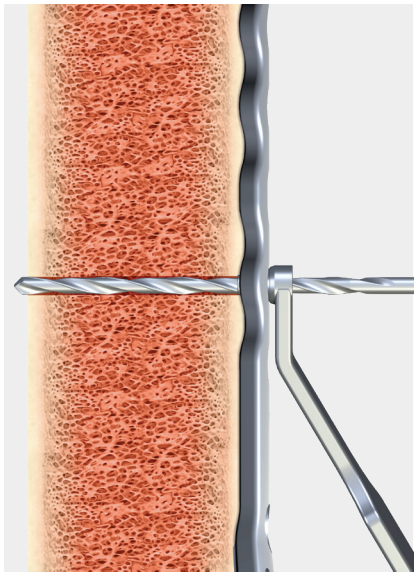
5

To apply the plate, drill a nonlocking screw in the compression hole using the appropriate size drill guide and drill bit. Measure the hole, with the depth measuring device, and place the screw using the appropriate size driver or screwdriver. This screw should be left slightly loose but in contact with the plate. This screw will be tightened with a manual driver in a future step. The degree of compression may be adjusted by the placement of the drill guide within the oblong screw hole. Placement furthest from the fracture site results in the greatest degree of compression.

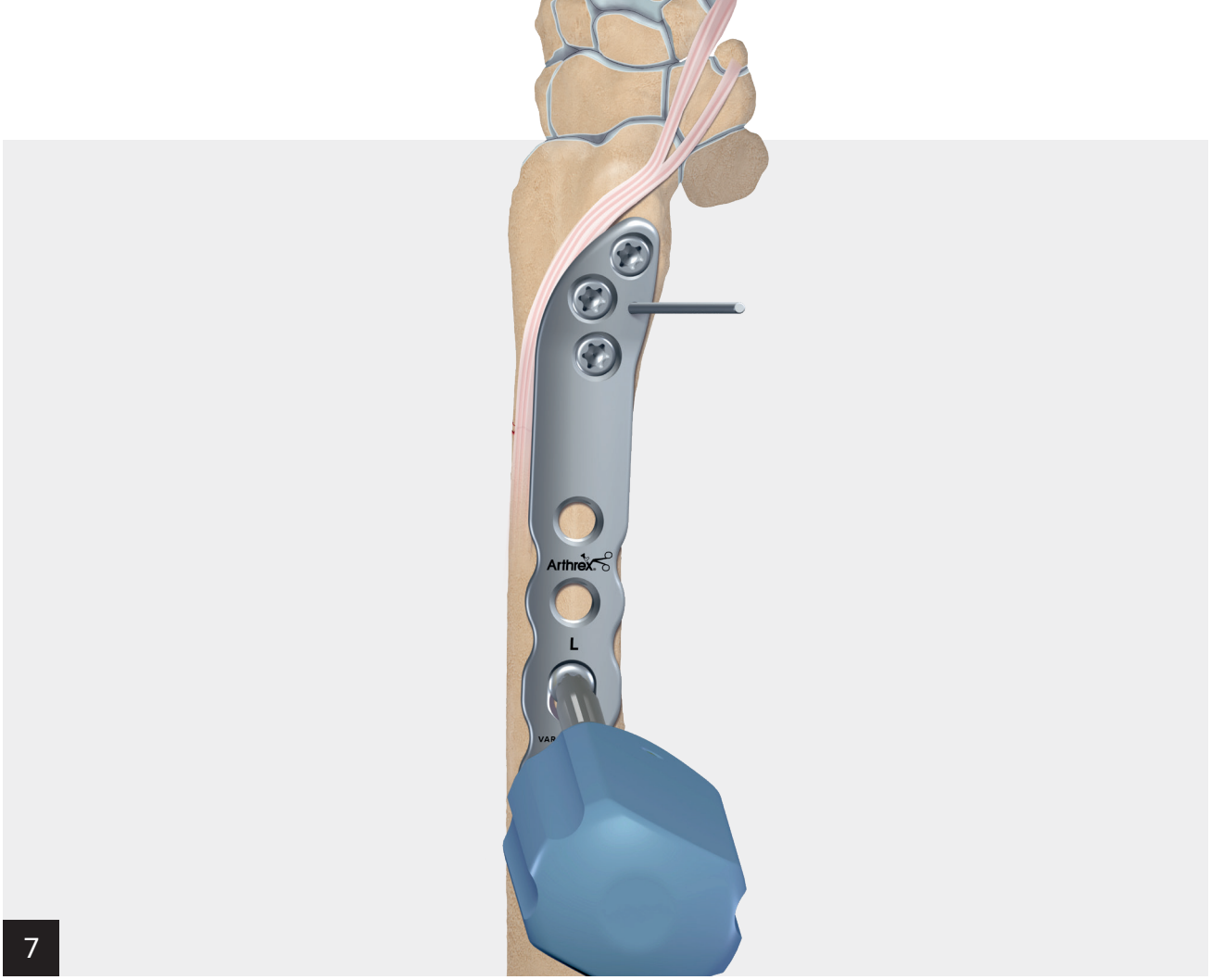


6

When placing the 3 locking screws in the distal segment, use the appropriate locking drill guide, drill bit, depth gauge, and note the screw trajectories. Once the first screw is placed on the distal segment, remove the distal K-wire. Screws may be placed under power and should be brought into contact with the plate. The final turns, however, should be performed manually with a screwdriver.

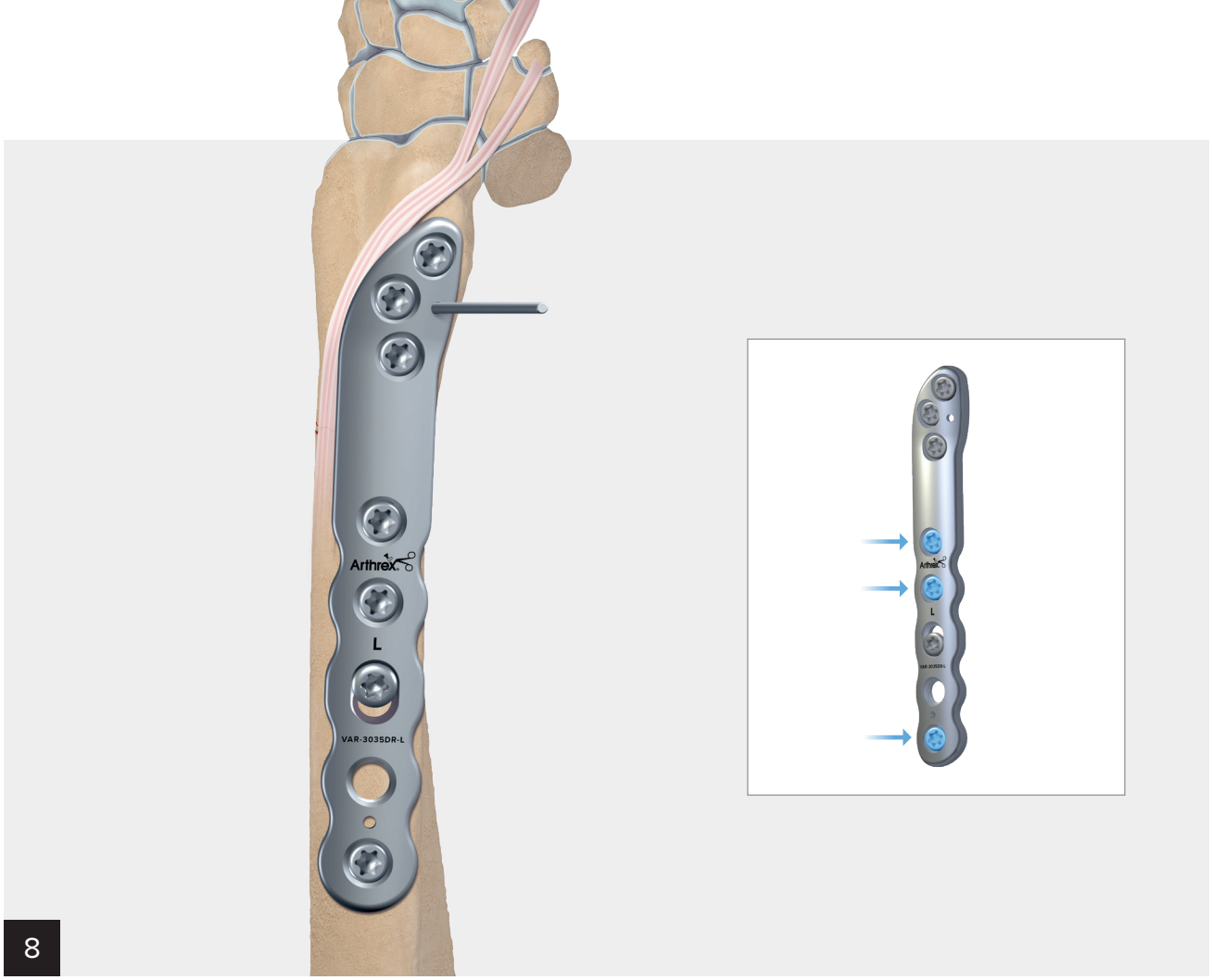


Note: The variable-angle guide can also be used for variable-angle locking titanium screws sizes 3.0 mm and below. If care is not taken, a screw placed using a variable-angle method can converge with another screw.



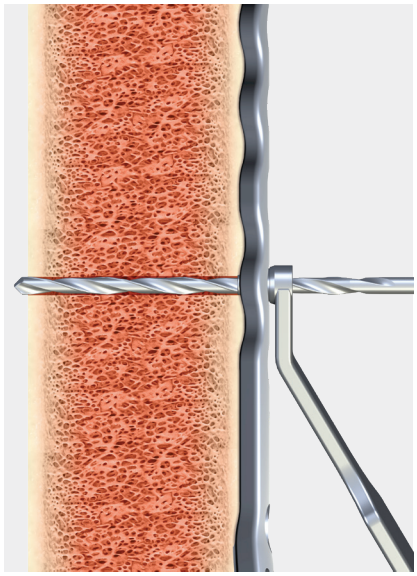
7

To apply compression to the fracture site, remove the proximal K-wire and manually tighten the nonlocking screw. Care should be taken to avoid overcompression.



8

Place the remaining locking screws in the proximal aspect, and use the appropriate locking drill guide, drill bit, and depth gauge. Screws may be placed under power and should be brought into contact with the plate. The final turns, however, should be performed manually with a screwdriver.



Note: The variable-angle guide can also be used for variable-angle locking titanium screws sizes 3.0 mm and below.

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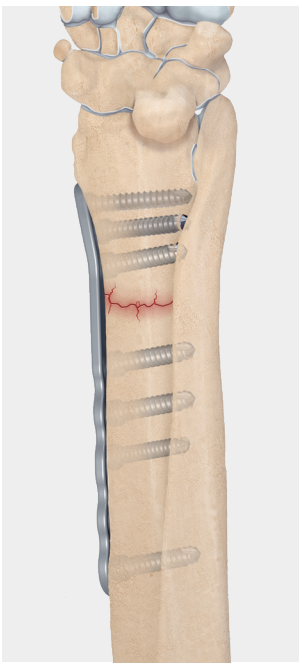
Final fixation: Finish with routine closure (dorsal view).



Ventral view

Lateral-ventral view

Cranial-Lateral Final Fixation

Dorsal view

Ventral screw trajectory view

Medial view

Lateral view

Surgical Pearls

- 1.6 mm plates are roughly 100% of the area moment of inertia of an OrthoLine™ T-plate
- 2.0 mm, 2.4 mm, and 3.0 mm plates are roughly 60% of the area moment of inertia of an OrthoLine T-plate
- 3.5 mm plates are roughly 90% of the area moment of inertia of an OrthoLine T-plate
- The plate was designed for a cranial-medial approach
- The plate sits cranial-medial against the abductor pollicis longus (APL) tendon/groove and away from the extensors
- The plate should be placed snuggly against the Suggest: APL tendon for the cranial-medial approach
- The plate can be rotated over the radius to get the best fit; the more cranially placed, the less mechanical advantage
- A second option is to place the right plate on the left leg in a cranial-lateral approach
- A left plate may fit the left leg in a cranial-medial approach with a severe angular limb deformity
- The design of the distal end is thin with a point to aid in avoiding the extensor grooves and sits on the tubercle of bone between the tendons
- Avoid leaving an open hole on either side of the bridge

Ordering Information

Radial Fracture Plates

Product Description	Item Number
1.6 mm Radial Fracture Plates (Gold)	
Radial fracture plate, titanium, 1.6 mm, left **(a)**	VAR-**3116DR-L**
Radial fracture plate, titanium, 1.6 mm, right **(b)**	VAR-**3116DR-R**
Radial fracture plate, broad, titanium, 1.6 mm, left **(c)**	VAR-**3116BDR-L**
Radial fracture plate, broad, titanium, 1.6 mm, right **(d)**	VAR-**3116BDR-R**
2.0 mm Radial Fracture Plates (Blue)	
Radial fracture plate, titanium, 2.0 mm, left **(e)**	VAR-**3120DR-L**
Radial fracture plate, titanium, 2.0 mm, right **(f)**	VAR-**3120DR-R**
2.4 mm Radial Fracture Plates (Green)	
Radial fracture plate, titanium, 2.4 mm, left **(g)**	VAR-**3124DR-L**
Radial fracture plate, titanium, 2.4 mm, right **(h)**	VAR-**3124DR-R**
3.0 mm Radial Fracture Plates (Purple)	
Radial fracture plate, titanium, 3.0 mm, left **(i)**	VAR-**3130DR-L**
Radial fracture plate, titanium, 3.0 mm, right **(j)**	VAR-**3130DR-R**
3.5 mm Radial Fracture Plates (Matte)	
Radial fracture plate, SS, 3.5 mm, left **(k)**	VAR-**3035DR-L**
Radial fracture plate, SS, 3.5 mm, right **(l)**	VAR-**3035DR-R**


(a)


(b)


(c)


(d)


(e)


(f)


(g)


(h)


(i)


(j)


(k)


(l)

Screws

Product Description	Item Number
1.6 mm Low-Profile Cortical, Variable-Angle, Titanium	
Low-profile cortical screw 1.6 mm × 6-20 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20 mm	VAR-**8916-06** to -**20**
Low-profile variable-angle screw 1.6 mm × 6-20 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20 mm	VAR-**8916V-06** to -**20**
2.0 mm Low-Profile Cortical, Locking, Variable-Angle, Titanium	
Low-profile cortical screw 2.0 mm × 6-30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8920-06** to -**30**
Low-profile locking screw 2.0 mm × 6-30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8920L-06** to -**30**
Low-profile variable-angle screw 2.0 mm × 6-30 mm Sizes: 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8920V-06** to -**30**
2.4 mm Low-Profile Cortical, Locking, Variable-Angle, Titanium	
Low-profile cortical screw 2.4 mm × 8-30 mm Sizes: 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8924-08** to -**30**
Low-profile locking screw 2.4 mm × 8-30 mm Sizes: 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8924L-08** to -**30**
Low-profile variable-angle screw 2.4 mm × 8-30 mm Sizes: 8, 9, 10, 11, 12, 13, 14, 16, 18, 20, 22, 24, 26, 28, 30 mm	VAR-**8924V-08** to -**30**
2.7 mm Low-Profile Cortical, Locking, Stainless Steel	
Low-profile cortical screw 2.7 mm × 10-34 mm Sizes: 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34 mm	VAR-**8827-10** to -**34**
Low-profile locking screw 2.7 mm × 10-34 mm Sizes: 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34 mm	VAR-**8827L-10** to -**34**
3.0 mm Low-Profile Cortical, Locking, Variable-Angle, Titanium	
Low-profile cortical screw 3.0 mm × 8-40 mm Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm	VAR-**8930-08** to -**40**
Low-profile locking screw 3.0 mm × 8-40 mm Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 40 mm	VAR-**8930L-08** to -**40**
Low-profile variable-angle screw 3.0 mm × 8-40 mm Sizes: 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40 mm	VAR-**8930V-08** to -**40**

Screws cont.

Product Description	Item Number
3.5 mm Low-Profile Cortical, Locking, Stainless Steel	
Low-profile cortical screw 3.5 mm × 16-60 mm Sizes: 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58,60 mm	VAR-**8835-16** to -**60**
Low-profile locking screw 3.5 mm × 16-60 mm Sizes: 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60 mm	VAR-**8835L-16** to -**60**
4.0 mm Low-Profile, Locking, Stainless Steel	
Low-profile locking screw 4.0 mm × 18-60 mm Sizes: 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60 mm	VAR-**8840L-18** to -**60**

Disposables and Limited Reusables

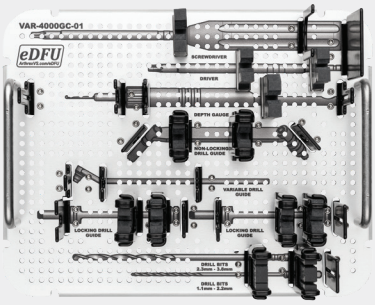
Product Description	Item Number
Drill bit, solid, AO, 1.1 mm (1.6 mm)	VAR-**4016D**
Drill bit, solid, AO, 1.5 mm (2.0 mm)	VAR-**4020D**
Drill bit, solid, AO, 1.8 mm (2.4 mm)	VAR-**4024D**
Drill bit, solid, AO, 2.0 mm (2.7 mm)	VAR-**8944-22**
Drill bit, solid, AO, 2.3 mm (3.0 mm)	VAR-**4030D**
Drill bit, solid, AO, 2.5 mm (3.5 mm)	VAR-**8943-30**
Drill bit, solid, AO, 2.8 mm (3.5 mm)	VAR-**4035D**
Drill bit, solid, AO, 3.5 mm (4.0 mm)	VAR-**4040D**
Drill bit, solid, short, AO, 1.1 mm (1.6 mm)	VAR-**4016SD**
Drill bit, solid, short, AO, 1.5 mm (2.0 mm)	VAR-**4020SD**
Drill bit, solid, short, AO, 1.8 mm (2.4 mm)	VAR-**4024SD**
Drill bit, solid, short, AO, 2.3 mm (3.0 mm)	VAR-**4030SD**
Guidewire w/ trocar tip, 0.86 mm × 80 mm	VAR-**8929K**
Guidewire w/ trocar tip, 1.1 mm × 150 mm	VAR-**8933K**
Guidewire w/ trocar tip, 1.3 mm × 150 mm	VAR-**8937K**

Instruments

Product Description	Item Number
Depth measuring device (1.6 mm/2.0 mm/2.4 mm)	VAR-**2024DD**
Depth measuring device (2.7 mm/3.0 mm/3.5 mm/4.0 mm)	VAR-**8943-15**
T6 driver (1.6 mm/2.0 mm)	VAR-**4020-01**
T8 driver (2.4 mm)	VAR-**4024-01**
T10 screwdriver (2.7 mm/3.0 mm)	VAR-**8944DH**
T15 driver (3.5 mm/4.0 mm)	VAR-**8941DH**
T6 screwdriver (1.6 mm/2.0 mm)	VAR-**4020-02**
T8 screwdriver (2.4 mm)	VAR-**4024-02**
Screw holding forceps (2.7 mm/3.0 mm)	VAR-**8943-08**
T15 screwdriver (3.5 mm)	VAR-**8943-10**
Locking plate holder, 2.0 mm	VAR-**4020-03**
Locking plate holder, 2.4 mm	VAR-**4024-03**
Locking plate holder, 2.7 mm/3.0 mm	VAR-**8950-09**
Locking plate holder, 3.5 mm	VAR-**8954-07**
Screw holding forceps	VAR-**8941F**

Product Description	Item Number
Drill/depth guide, locking, 1.6 mm	VAR-**4016DG**
Drill/depth guide, locking 2.0 mm	VAR-**4020DG**
Drill/depth guide, locking, 2.4 mm	VAR-**4024DG**
Drill/depth guide, locking, 2.7 mm	VAR-**8950-07**
Drill/depth guide, locking, 3.0 mm	VAR-**4030DG**
Drill/depth guide, locking, 3.5 mm	VAR-**4035DG**
Drill/depth guide, locking, 4.0 mm	VAR-**4040DG**
Drill guide, 1.1 mm (1.6 mm)	VAR-**4016TDG**
Tap/drill guide, 2.0 mm/1.5 mm (2.0 mm)	VAR-**4020TDG**
Tap/drill guide, 2.4 mm/1.8 mm (2.4 mm)	VAR-**4024TDG**
2.0 mm/3.0 mm nonlocking drill guide	VAR-**8943-31**
Tap/drill guide, 3.0 mm/2.3 mm (3.0 mm)	VAR-**4030TDG**
Drill guide (3.5 mm)	VAR-**8943-14**
BB-Tak, small, threaded	VAR-**8933TBB**
BB-Tak, small	VAR-**8933BB**
BB-Tak, large	VAR-**8941BB**
BB-Tak, large, threaded	VAR-**8941TBB**
Drill guide, variable, 1.6 mm	VAR-**4016VDG**
Drill guide, variable, 2.0 mm	VAR-**4020VDG**
Drill guide, variable, 2.4 mm	VAR-**4024VDG**
Drill guide, variable, 3.0 mm	VAR-**4030VDG**
Bone tap, 2.0 mm	VAR-**4020T**
Bone tap, 2.4 mm	VAR-**4024T**
Bone tap, 2.7 mm	VAR-**4027T**
Bone tap, 3.0 mm	VAR-**4030T**
K-wire drill guide, 0.86 mm (1.6 mm/2.0 mm)	VAR-**4020KDG**
K-wire drill guide, 1.14 mm (2.4 mm)	VAR-**4024KDG**
K-wire drill guide, 1.14 mm (2.7 mm/3.0 mm)	VAR-**4030KDG**
K-wire drill guide, 1.3 mm (3.5 mm)	VAR-**4035KDG**
Bending plug, cannulated, 1.6 mm/2.0 mm	VAR-**4020-04**
Bending plug, cannulated, 2.4 mm	VAR-**4024-04**
Bending plug, cannulated, 2.7 mm	VAR-**4027-04**
Bending plug, cannulated, 3.0 mm	VAR-**4030-04**
Bending plug, cannulated, 3.5 mm	VAR-**4035-04**
Bending iron, small (1.6 mm/2.0 mm)	VAR-**4000-07**
Bending iron, medium (2.4 mm/3.0 mm)	VAR-**4000-08**
Bending iron, large (3.5 mm/3.5 mm broad)	VAR-**4000-09**
Freer elevator	VAR-**4000-10**
Hohmann retractor, double ended, 6 mm/10 mm	VAR-**4000-11**
Ikuta clamp	VAR-**4000-12**
Lobster clamp, mini	VAR-**4000-13**
Lobster clamp, mini, radiolucent	VAR-**4000-14**
Periosteal elevator, 6 mm curved blade	VAR-**4000-15**
Pliers, needlenose	VAR-**4000-16**
Pointed reduction forceps	VAR-**4000-17**
Reduction forceps, guidewire	VAR-**4000-18**
Sharp hook	VAR-**4000-19**
Termite forceps	VAR-**4000-20**
Toothed reduction forceps, Kocher	VAR-**4000-21**

Cases and Caddies

Image	Product Description	Item Number
	OrthoLine™ case	VAR-**4000GC**
	Generic case insert	VAR-**4000GC-01**
	1.6 mm Screw caddy	VAR-**3016SC-01**
	2.0 mm Screw caddy	VAR-**3020SC-01**
	2.4 mm Screw caddy	VAR-**3024SC-01**

Cases and Caddies

Image	Product Description	Item Number
	3.0 mm Screw caddy	VAR-**3030SC-01**
	2.7 mm Screw caddy	VAR-**4027SC-01**
	3.5 mm/4.0 mm Screw caddy	VAR-**4035SC-02**
	Bending plug caddy	VAR-**4000BPC**

Notes

Notes

Notes

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This is not veterinary advice and Arthrex recommends that veterinarians be trained in the use of any particular product before using it in surgery. A veterinarian must always rely on their own professional clinical judgment when deciding whether to use a particular product. A veterinarian must always refer to the package insert, product label, and/or directions for use before using any Arthrex product. Products may not be available in all markets because product availability is subject to the regulatory or veterinary practices in individual markets. 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. Please contact your Arthrex representative if you have questions about availability of products in your area.

Arthrex manufacturer, authorized representative, and importer information (Arthrex eIFUs)

US patent information

arthrexvetsystems.com