

# OrthoLine™ Distal Femoral Osteotomy System

Surgical Technique

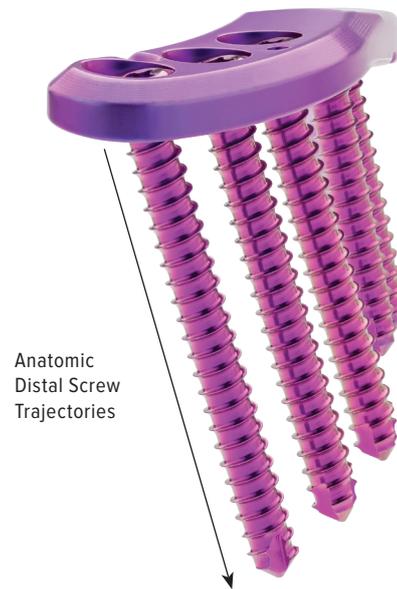


  
**Arthrex®**  
**Vet Systems**

# OrthoLine™ Distal Femoral Osteotomy System

## Introduction

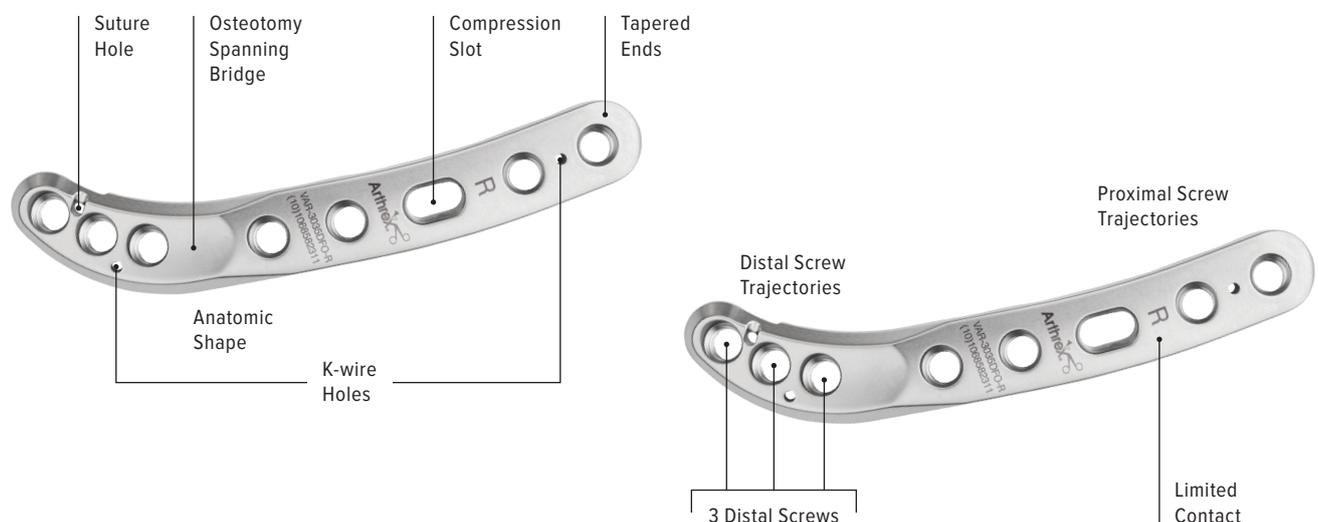
The OrthoLine distal femoral Osteotomy plate system includes a range from 1.6 mm to 3.5 mm in both broad and short sized plates. Each plate size is anatomically contoured to mimic the anatomy of patients within a given size range. The plate includes distal screw trajectories calculated to avoid the joint and intercondylar notch of the stifle. The proximal screw trajectories align with the bone stock of the diaphyseal bone. This plate is designed to minimize soft tissue irritation. Additionally, the DFO plate includes a suture hole. This is a unique feature that allows for added patellar stabilization by securing a suture strand from the parapatellar ligament to the suture hole within the plate.



## Features and Benefits

- Distal screw trajectories avoid the joint and intercondylar notch
- Proximal screw trajectories align centrally in the diaphyseal bone
- Compression slot allows the surgeon to dictate desired compression
- Anatomic plate design with left and right options
- Strong bridging plate design
- Tapered design to avoid soft tissue irritation
- Suture hole for additional patellar stabilization

## Anatomic Design



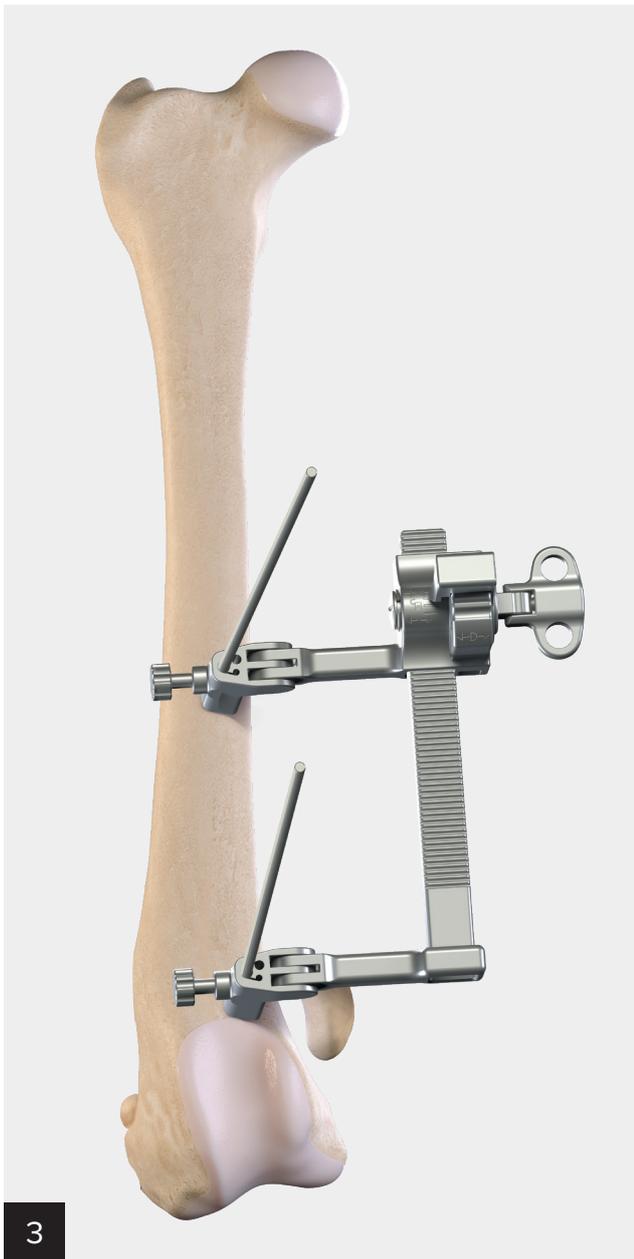


Distal femoral varus with a medial patellar luxation.



A lateral approach is made to the distal femur and the planned osteotomy is executed on the bone at the level of the CORA or slightly more proximal if a larger distal segment is required to accommodate the plate.

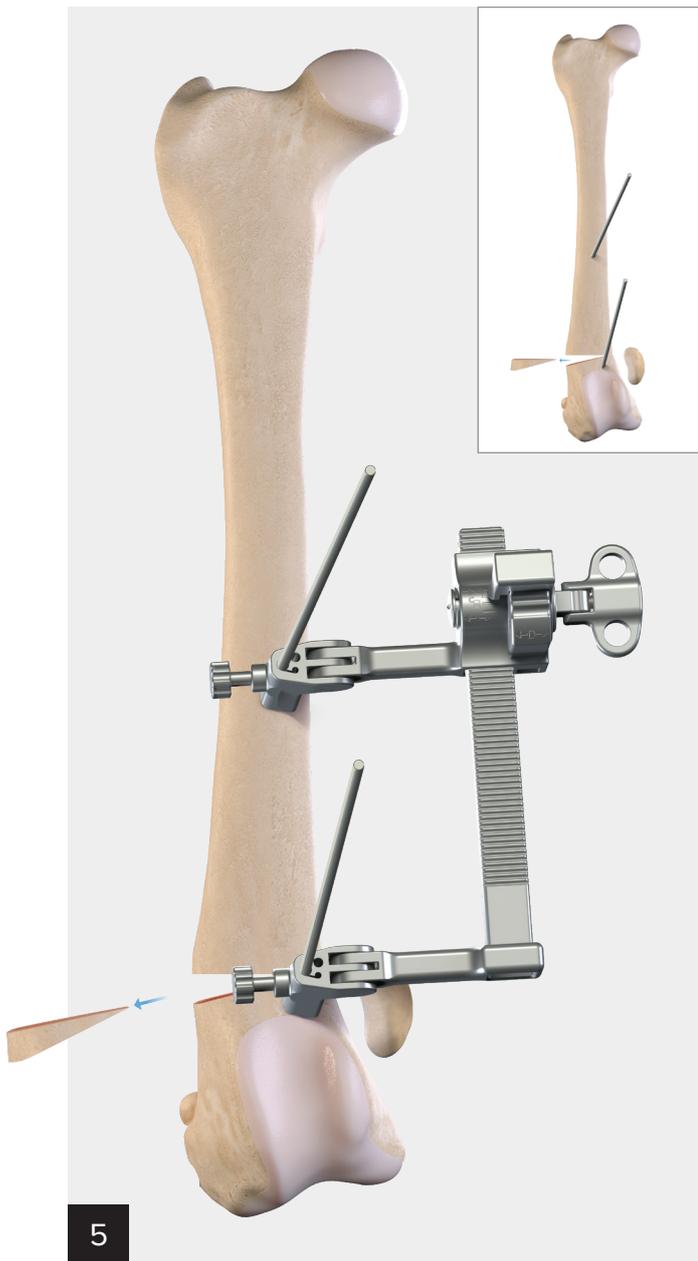
**Note: For challenging cases where custom guides may be required, contact your local rep for assistance.**



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Preplace the jig pins for the osteotomy. The distal pin is located distal to the planned cut location. The jig will help maintain reduction and assist in rotational alignment.



4  
Once the jig and pins are placed, the jig may be removed to improve visualization, keeping the reduction pins in place. If a rotational correction is required, score the cut with an osteotome and mark the level of correction.



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Perform the osteotomy using an oscillating saw, remove the wedge and save for future grafting if required.



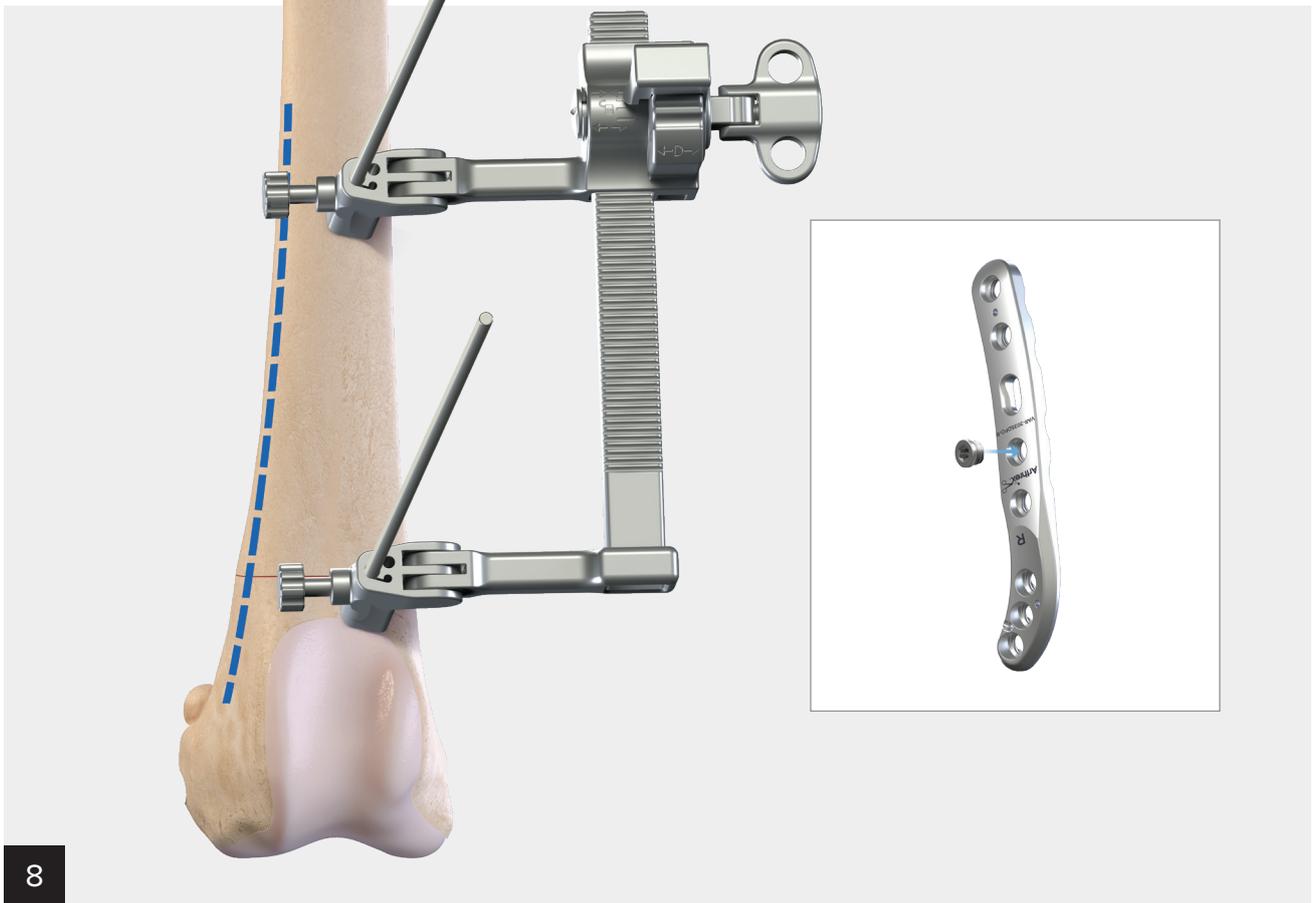
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Reduce the segment with the appropriate rotational correction if indicated. Hold in reduction with the jig. A new distal jig pin may be used if required.



Place the implant on the surface of the femur bone to determine contour requirements. The bridge of the plate should span the osteotomy and the distal end of the plate should be placed at the fabella line. The plate is not designed to go to the distal aspect of the condyle.

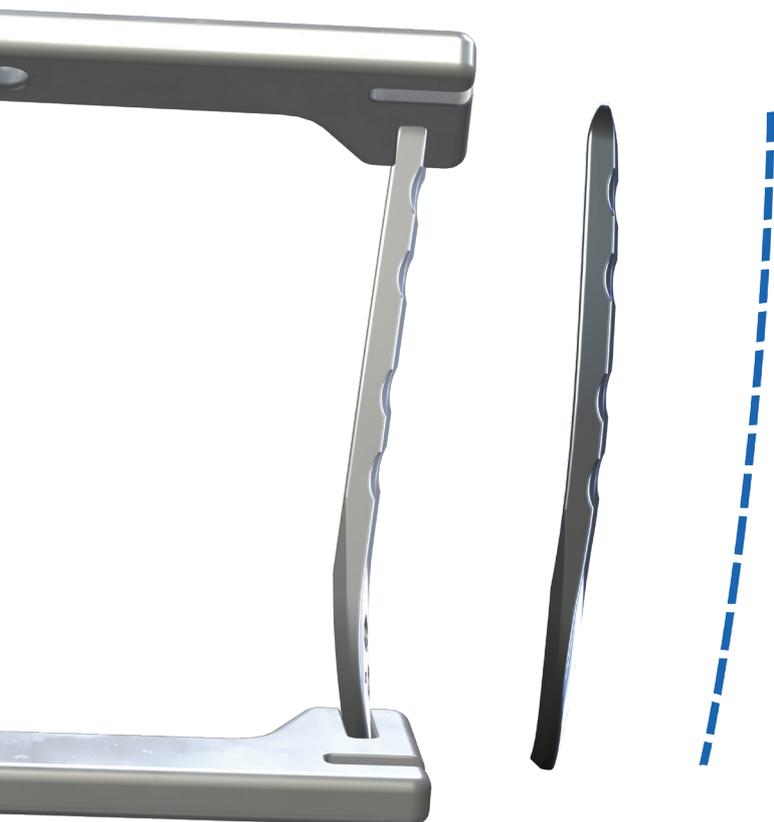
**Note: The plate does not go to the condyle.**

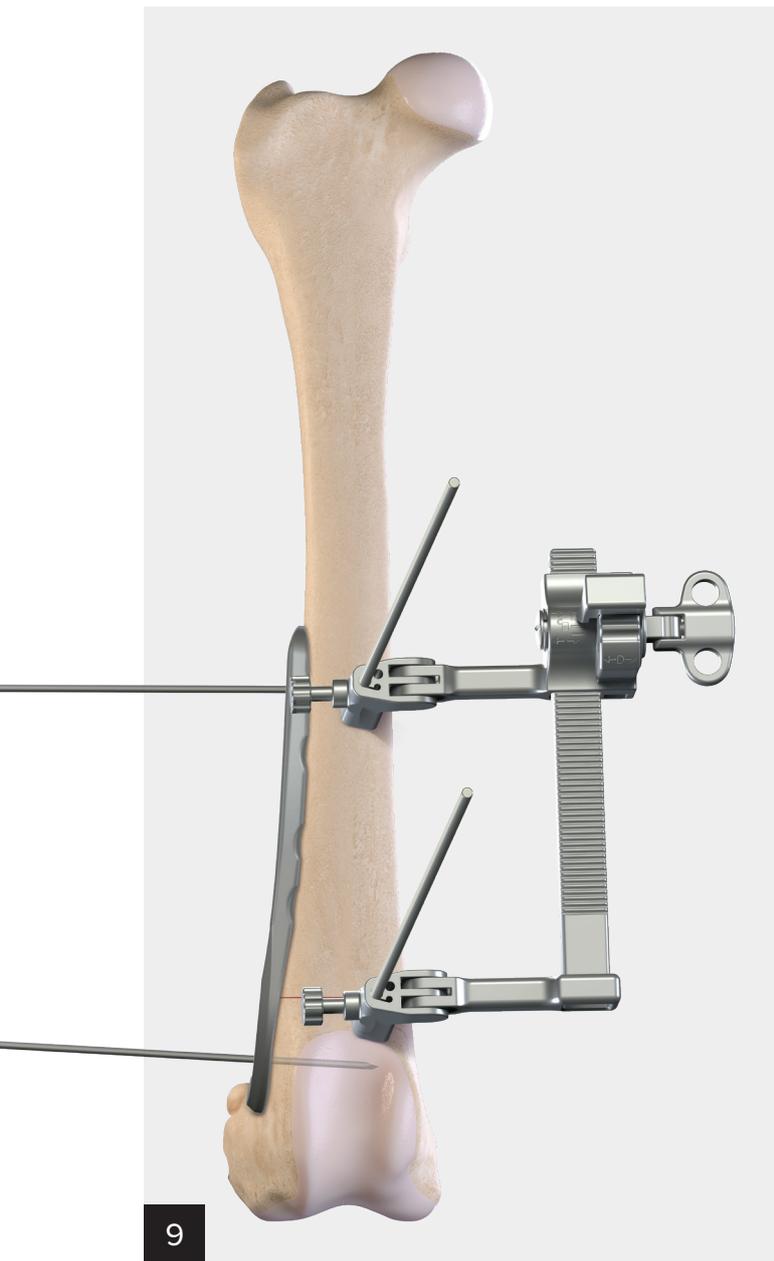


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If contouring is required, place a threaded bending plug into the locking screw holes where the plate will be contoured. Contour the plate as necessary using bending irons. Screw trajectories may change if large

contours are made. Once the contouring is complete, the bending plugs can be removed or used with K-wires for temporary fixation.

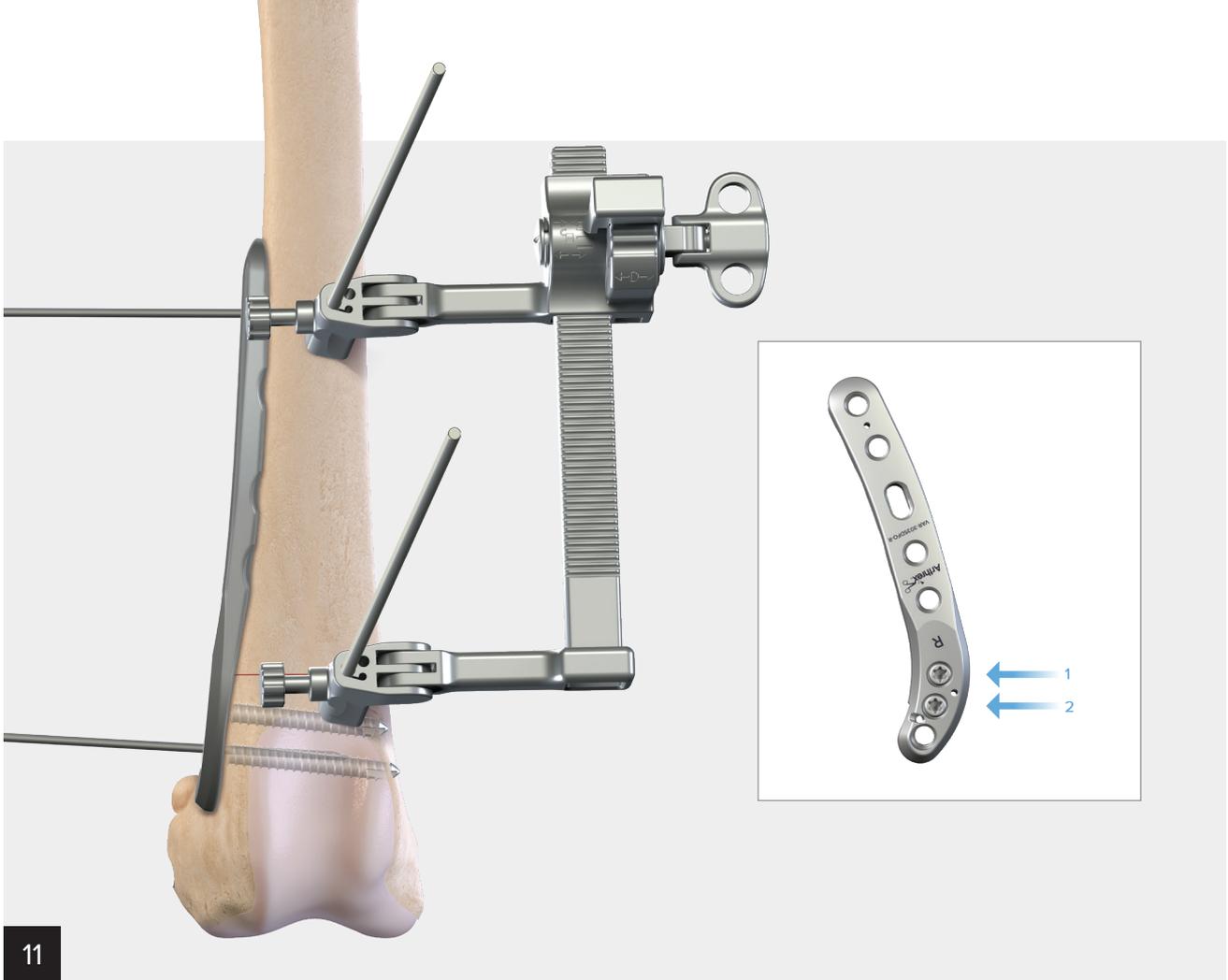




The plate may be temporarily affixed to the bone using multiple methods. For temporary fixation, K-Wire holes and K-Wires can be used in conjunction with the cannulated bending plugs.



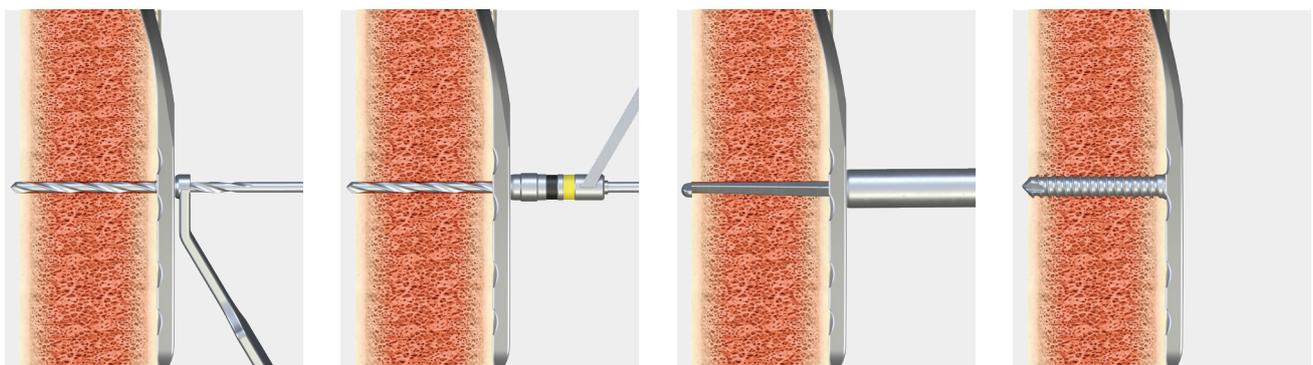
The application of a BB-Tak in the center of a universal hole can be used to temporarily affix the plate to the bone. A threaded BB-Tak can also be applied in the center of a universal hole. A threaded BB-Tak will help to pull the plate to the bone as well.



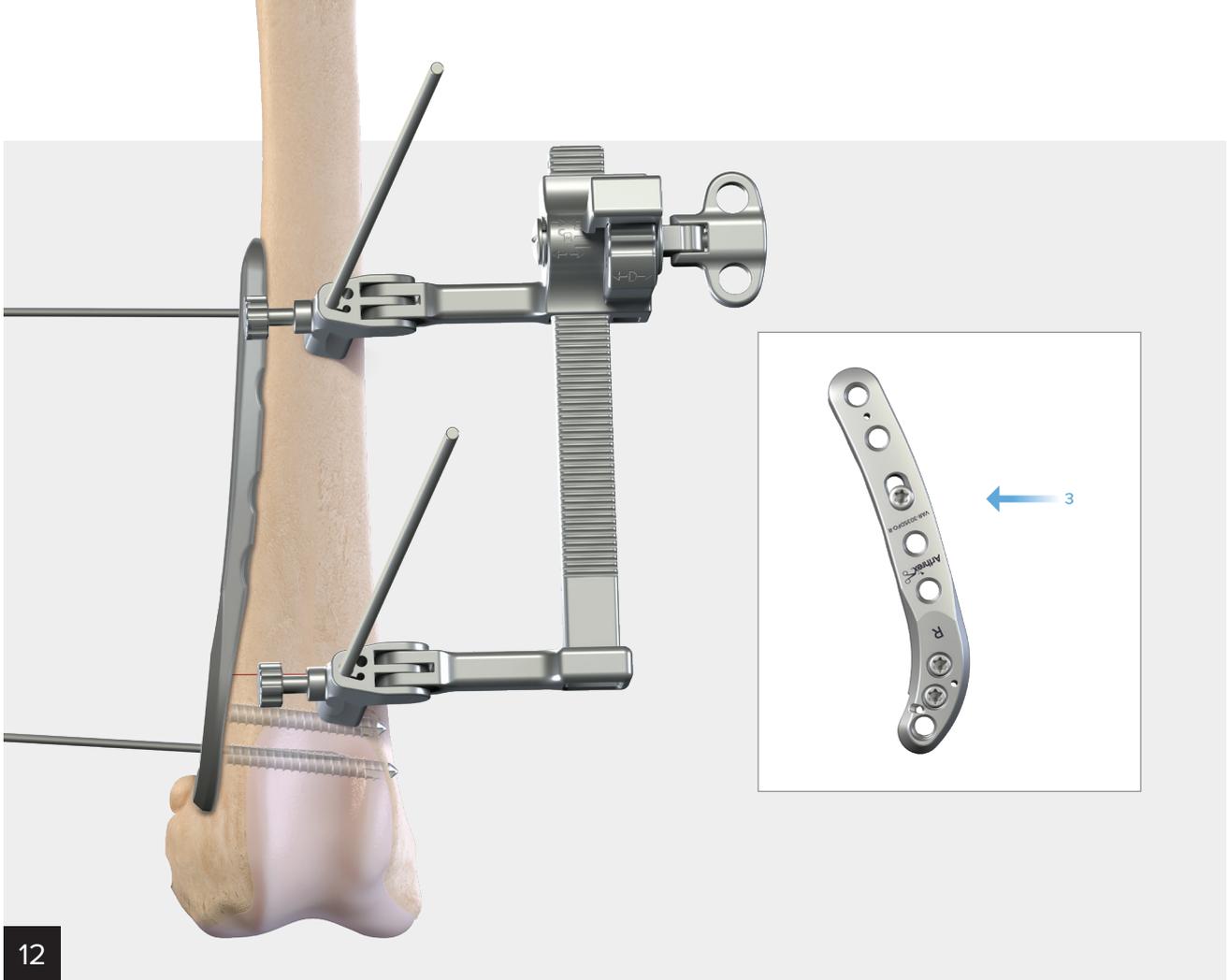
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When applying the plate, use the appropriate locking drill guide, drill bit, and depth gauge to place 2 locking screws in the distal segment avoiding the reduction pin. Screws may be placed under power and should be brought into contact with the plate. However, manually use the screwdriver for the final turns.

**Note: The variable-angle guide can also be used for variable-angle locking titanium screws sizes less than 3.0 mm.**



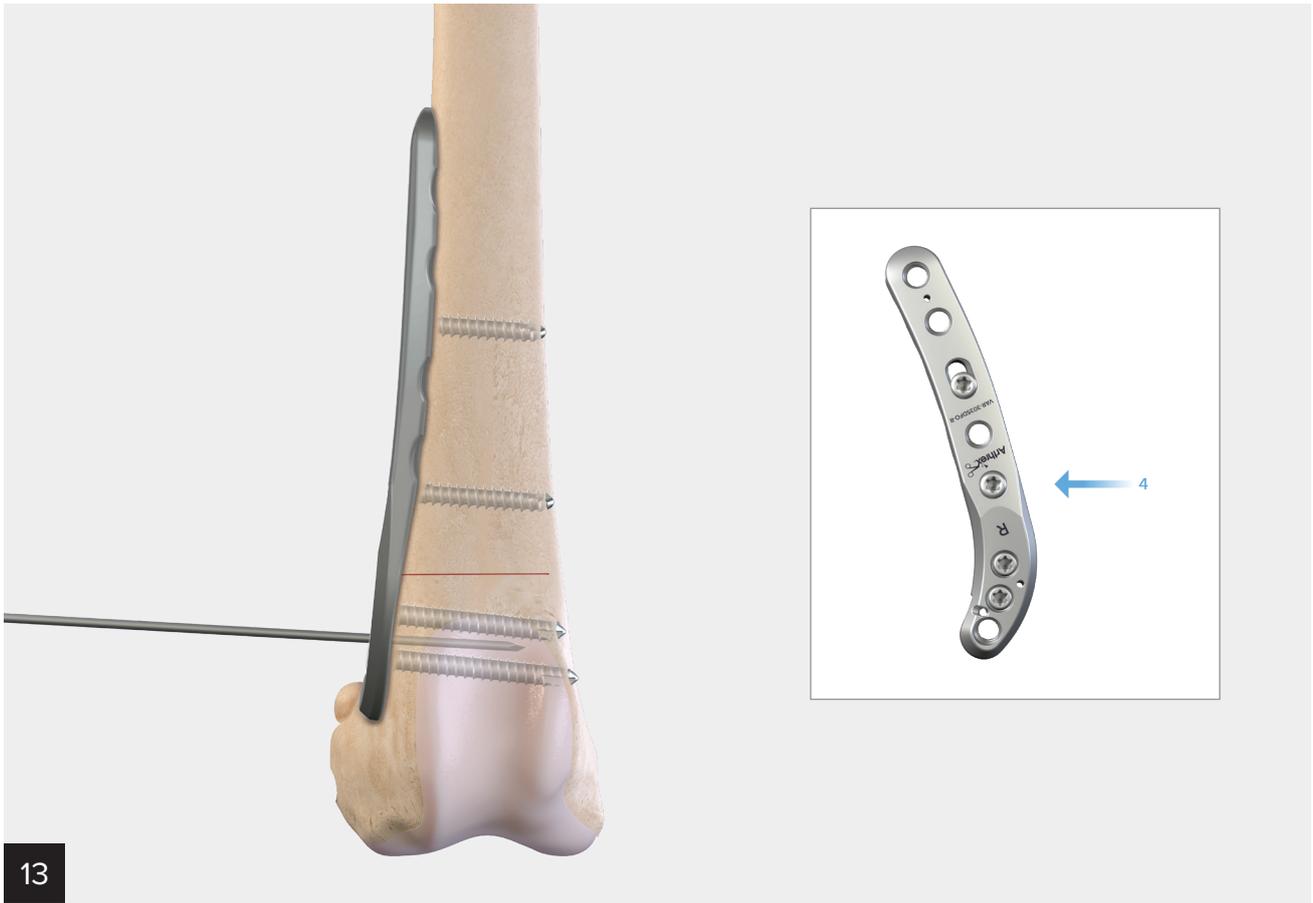
Variable angle options for titanium plates and screws.



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If compression is desired across the osteotomy, place a cortical screw in the compression hole. Place the universal drill guide farthest away from the fracture within the compression hole of the plate, drill, measure, and insert the screw. Be sure not to overcompress the osteotomy, especially in cases with excellent reduction.

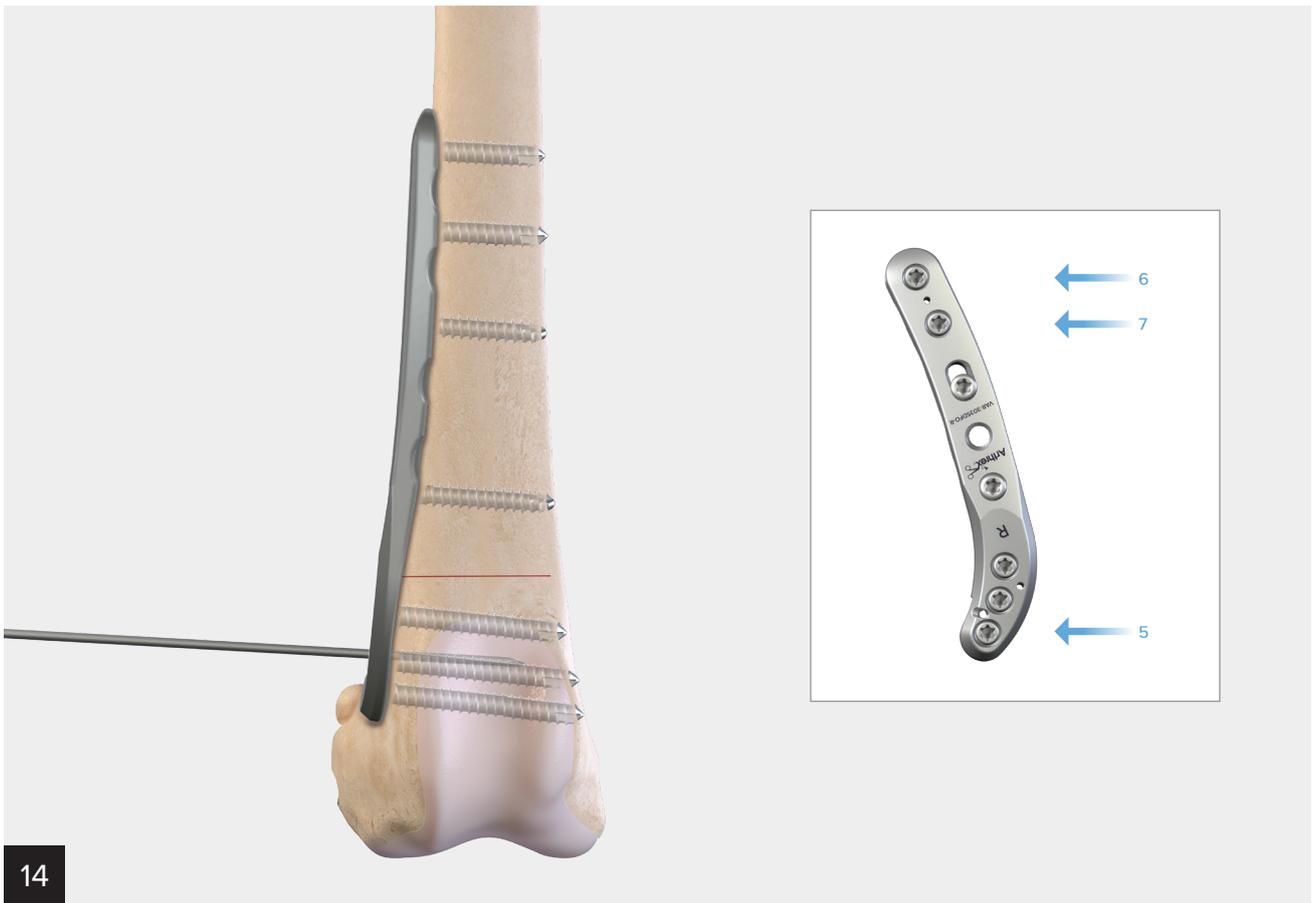
The placement of the drill guide within the oblong screw hole may adjust the degree of compression. For greater compression, place the drill guide farthest from the osteotomy site. Before tightening the screw, remove the proximal K-wire temporary fixation pin.



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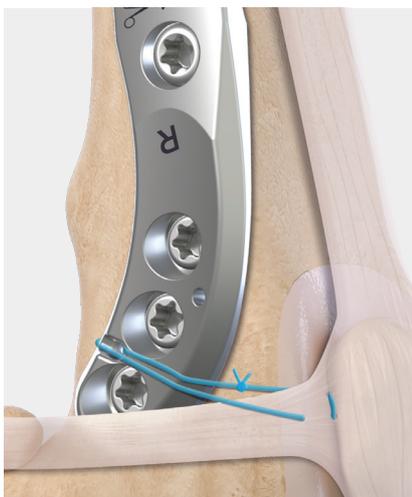
If the desired compression has been achieved, place the next locking screw just proximal to the osteotomy. Screws may be placed under power. However, manually use the screwdriver for the final turns. The jig and jig pins may be removed.

**Note: The variable-angle guide can also be used for variable-angle locking titanium screws sizes less than 3.0 mm.**



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Drill and place the additional locking screws desired, ideally 6 cortices on each side of the osteotomy. If additional stabilization is required, a medial plate may be placed.

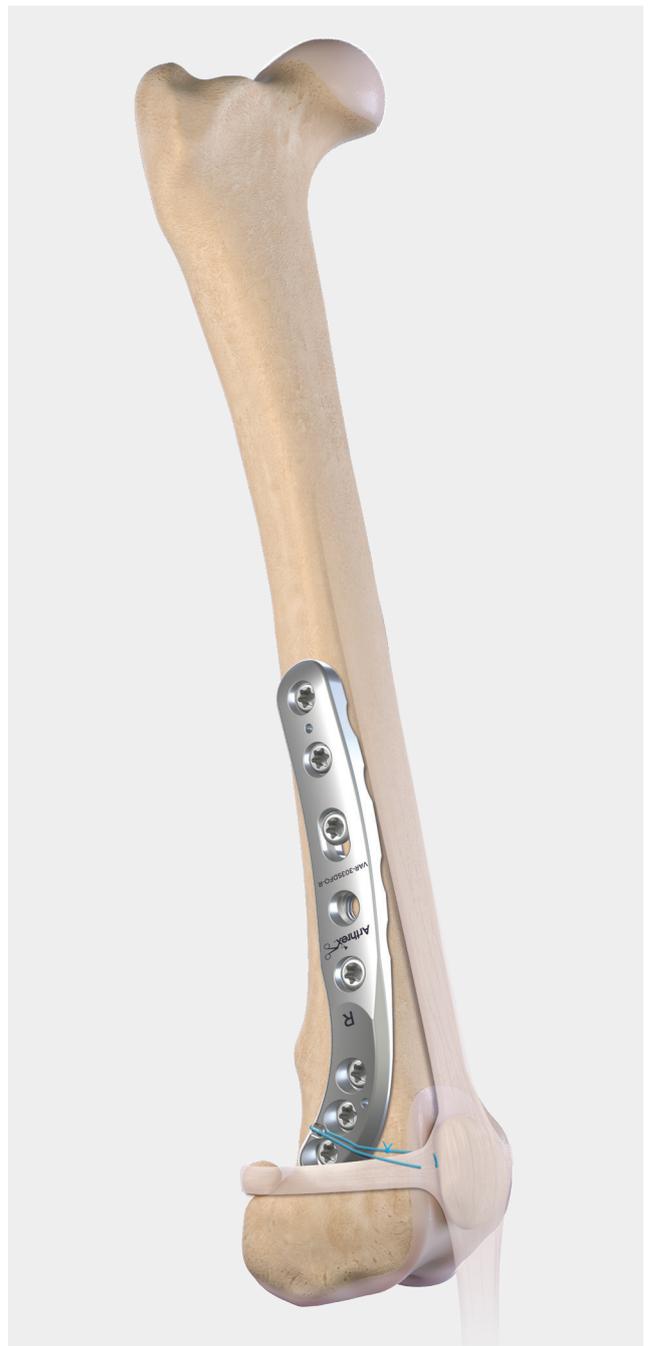


For additional patellar stabilization, a suture may be secured from the parapatellar ligament to the suture hole aperture in the plate. Place a mattress stitch in the parapatellar, remove the needle from the suture, and feed the suture through the suture hole of the plate. Temporarily tension the suture and move the patella through a range of motion to verify isometric placement. Tie the suture in standard fashion and finish with routine closure.

**Note: Refer to Suture Reference Chart for size options.**



Final fixation: Cranial view.



Lateral view.



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A medial approach and placement is an option. However, the left plate would be used on a right femur and the right femur, and the right plate would be used on the left femur.

## Suture Reference Chart



Plate Size	Plate	VetSuture	Product Description
1.6 mm/2.0 mm		VAR-R316	Polydioxanone 3-0, SH, TP, 1/2 C
		VAR-R317	Polydioxanone 2-0, SH, TP, 1/2 C
		VAR-J8665	Polypropylene 3-0, FS-2, Rev Ctg, 3/8 C
2.0 mm/2.4 mm		VAR-R334	Polydioxanone 0, CT-2, TP, 1/2 C
		VAR-R340	Polydioxanone 0, CT-1, TP, 1/2 C
		VAR-R467	Polydioxanone 0, CP-1, Rev Ctg, 1/2 C
3.0 mm/3.5 mm		VAR-R468	Polydioxanone 1, CP-1, Rev Ctg, 1/2 C
		VAR-R468	Polydioxanone 1, CP-1, Rev Ctg, 1/2 C

## Blade Chart

### 300 Saw Blades

Blade	Product Description	Length × Width × Thickness	Pass/Fail
	300 Sagittal saw blade	40 × 14 × 0.6 mm	AR-300-040S
	300 Sagittal saw blade	40 × 9.5 × 0.6 mm	AR-300-041S
	300 Sagittal saw blade EZ-90	25 × 9.4 × 0.7 mm	AR-300-042S

### 600 Saw Blades

Blade	Product Description	Length × Width × Thickness	Pass/Fail
	600 Sagittal saw blade	65 × 46 × 0.6 mm	AR-600-050S
	600 Sagittal saw blade	65 × 27 × 0.8 mm	AR-600-051S
	600 Sagittal saw blade	65 × 18 × 0.8 mm	AR-600-052S
	600 Sagittal saw blade MIS	65 × 46 × 0.6 mm	AR-600-350S
	600 Sagittal saw blade	65 × 27 × 0.8 mm	AR-600-351S
	600 Sagittal saw blade	65 × 18 × 0.8 mm	AR-600-352S

## Ordering Information

### Distal Femoral Osteotomy Plates

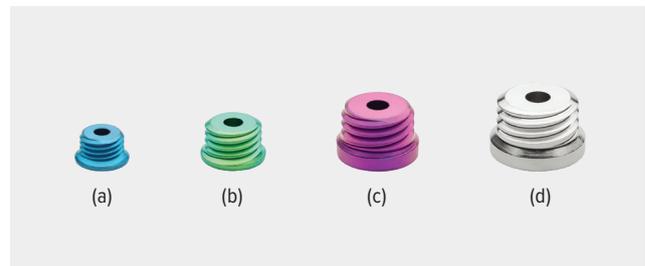
Product Description	Item Number
<b>1.6 mm Distal Femur Osteotomy Broad Plates (Gold)</b>	
Distal femur osteotomy plate, broad, short, 1.6 mm, titanium, left	VAR-3116BDFOS-L
Distal femur osteotomy plate, broad, short, 1.6 mm, titanium, right	VAR-3116BDFOS-R
Distal femur osteotomy plate, broad, 1.6 mm, titanium, left	VAR-3116BDFO-L
Distal femur osteotomy plate, broad, 1.6 mm, titanium, right	VAR-3116BDFO-R
<b>2.0 mm Distal Femoral Osteotomy Plates (Blue)</b>	
Distal femur osteotomy plate, short, 2.0 mm, titanium, left	VAR-3120DFOS-L
Distal femur osteotomy plate, short, 2.0 mm, titanium, right	VAR-3120DFOS-R
Distal femur osteotomy plate, 2.0 mm, titanium, left	VAR-3120DFO-L
Distal femur osteotomy plate, 2.0 mm, titanium, right	VAR-3120DFO-R
<b>2.4 mm Distal Femoral Osteotomy Plates (Green)</b>	
Distal femur osteotomy plate, short, 2.4 mm, titanium, left	VAR-3124DFOS-L
Distal femur osteotomy plate, short, 2.4 mm, titanium, right	VAR-3124DFOS-R
Distal femur osteotomy plate, 2.4 mm, titanium, left	VAR-3124DFO-L
Distal femur osteotomy plate, 2.4 mm, titanium, right	VAR-3124DFO-R
<b>3.0 mm Distal Femoral Osteotomy Plates (Purple)</b>	
Distal femur osteotomy plate, 3.0 mm, titanium, left	VAR-3130DFO-L
Distal femur osteotomy plate, 3.0 mm, titanium, right	VAR-3130DFO-R
<b>3.5 mm Distal Femoral Osteotomy Plates (Matte)</b>	
Distal femur osteotomy plate, 3.5 mm, stainless steel, left	VAR-3035DFO-L
Distal femur osteotomy plate, 3.5 mm, stainless steel, right	VAR-3035DFO-R



## Screws

Product Description	Item Number
<b>1.6 mm Low-Profile Cortical, Variable-Angle, Titanium</b>	
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
<b>2.0 mm Low-Profile Cortical, Locking, Variable-Angle, Titanium</b>	
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
<b>2.4 mm Low-Profile Cortical, Locking, Variable-Angle, Titanium</b>	
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
<b>2.7 mm Low-Profile Cortical, Locking, Stainless Steel</b>	
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
<b>3.0 mm Low-Profile Cortical, Locking, Variable-Angle, Titanium</b>	
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

Product Description	Item Number
<b>3.5 mm Low-Profile Cortical, Locking, Stainless Steel</b>	
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
<b>4.0 mm Low-Profile, Locking, Stainless Steel</b>	
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



## Bending Plugs

Product Description	Item Number
Bending plug, cannulated, 1.6 mm/2.0 mm (a)	VAR-4020-04
Bending plug, cannulated, 2.4 mm (b)	VAR-4024-04
Bending plug, cannulated, 2.7 mm	VAR-4027-04
Bending plug, cannulated, 3.0 mm (c)	VAR-4030-04
Bending plug, cannulated, 3.5 mm (d)	VAR-4035-04
Bending plug caddy	VAR-4000BPC

## Instruments

Product Description	Item Number
<b>Instruments for 1.6 mm OrthoLine™ Plating System (Bronze/Gold)</b>	
Drill bit, solid, AO, 1.1 mm (1.6 mm)	VAR-4016D
Drill bit, solid, short, AO, 1.1 mm (1.6 mm)	VAR-4016SD
Depth measuring device (1.6 mm/2.0 mm/2.4 mm)	VAR-2024DD
T6 driver (1.6 mm/2.0 mm)	VAR-4020-01
T6 screwdriver (1.6 mm/2.0 mm)	VAR-4020-02
Screw holding forceps	VAR-8941F
Drill/depth guide, locking, 1.6 mm (1.6 mm)	VAR-4016DG
Drill guide, 1.1 mm (1.6 mm)	VAR-4016TDG
Drill guide, variable, 1.6 mm (1.6 mm)	VAR-4016VDG
0.86 mm K-wire drill guide, locking, 1.6 mm/2.0 mm	VAR-4020KDG
Bending iron, small (1.6 mm/2.0 mm)	VAR-4000-07
BB-Tak, small 1.1 mm × 40 mm (1.6 mm/2.0 mm/2.4 mm)	VAR-8933BB
BB-Tak, small, threaded 1.1 mm × 40 mm (1.6 mm/2.0 mm/2.4 mm)	VAR-8933TBB
Guidewire w/ trocar tip, 0.86 mm × 80 mm (1.6 mm/2.0 mm)	VAR-8929K
<b>Instruments for 2.0 mm OrthoLine Plating System (Blue)</b>	
Drill bit, solid, AO, 1.5 mm (2.0 mm)	VAR-4020D
Drill bit, solid, short, AO, 1.5 mm (2.0 mm)	VAR-4020SD
Depth measuring device (1.6 mm/2.0 mm/2.4 mm)	VAR-2024DD
T6 driver (1.6 mm/2.0 mm)	VAR-4020-01
T6 screwdriver (1.6 mm/2.0 mm)	VAR-4020-02
Screw holding forceps	VAR-8941F
Drill/depth guide, locking 2.0 mm (2.0 mm)	VAR-4020DG
Tap/drill guide, 2.0/1.5 mm (2.0 mm)	VAR-4020TDG
Drill guide, variable, 2.0 mm (2.0 mm)	VAR-4020VDG
0.86 mm K-wire drill guide, locking, 1.6 mm/2.0 mm	VAR-4020KDG
Bone tap, 2.0 mm (2.0 mm)	VAR-4020T
Bending iron, small (1.6 mm/2.0 mm)	VAR-4000-07
BB-Tak, small 1.1 mm × 40 mm (1.6 mm/2.0 mm/2.4 mm)	VAR-8933BB
BB-Tak, small, threaded 1.1 mm × 40 mm (1.6 mm/2.0 mm/2.4 mm)	VAR-8933TBB
Guidewire w/ trocar tip, 0.86 × 80 mm (1.6 mm/2.0 mm)	VAR-8929K
<b>Instruments for 2.4 mm OrthoLine Plating System (Green)</b>	
Drill bit, solid, AO, 1.8 mm (2.4 mm)	VAR-4024D
Drill bit, solid, short, AO, 1.8 mm (2.4 mm)	VAR-4024SD
Depth measuring device (1.6 mm/2.0 mm/2.4 mm)	VAR-2024DD
T8 driver (2.4 mm)	VAR-4024-01
T8 screwdriver (2.4 mm)	VAR-4024-02
Screw holding forceps	VAR-8941F
Drill/depth guide, locking, 2.4 mm (2.4 mm)	VAR-4024DG
Tap/drill guide, 2.4 mm/1.8 mm (2.4 mm)	VAR-4024TDG
Drill guide, variable, 2.4 mm (2.4 mm)	VAR-4024VDG
1.14 mm K-wire drill guide, locking, 2.4 mm	VAR-4024KDG
Bone tap, 2.4 mm (2.4 mm)	VAR-4024T
Bending iron, medium (2.4 mm/3.0 mm)	VAR-4000-08
BB-Tak, small 1.1 mm × 40 mm (1.6 mm/2.0 mm/2.4 mm)	VAR-8933BB
BB-Tak, small, threaded 1.1 mm × 40 mm (1.6 mm/2.0 mm/2.4 mm)	VAR-8933TBB
Guidewire w/ trocar tip, 1.1 mm × 150 mm (2.4 mm/3.0 mm)	VAR-8933K

Product Description	Item Number
<b>Instruments for 3.0 mm OrthoLine Plating System (Purple)</b>	
Drill bit, solid, AO, 2.3 mm (3.0 mm)	VAR-4030D
Drill bit, solid, short, AO, 2.3 mm (3.0 mm)	VAR-4030SD
Depth measuring device (2.7 mm/3.0 mm/3.5 mm/4.0 mm)	VAR-8943-15
T10 driver (2.7 mm/3.0 mm)	VAR-8944DH
T10 screwdriver (2.7 mm/3.0 mm)	VAR-8943-08
Screw holding forceps	VAR-8941F
Drill/depth guide, locking, 3.0 mm (3.0 mm)	VAR-4030DG
Tap/drill guide, 3.0 mm/2.3 mm (3.0 mm)	VAR-4030TDG
Drill guide, variable, 3.0 mm (3.0 mm)	VAR-4030VDG
1.14 mm K-wire drill guide, locking, 2.7 mm/3.0 mm (2.7 mm/3.0 mm)	VAR-4030KDG
Bone tap, 3.0 mm (3.0 mm)	VAR-4030T
Bending iron, medium (2.4 mm/3.0 mm)	VAR-4000-08
BB-Tak, large 1.6 mm × 50 mm (2.4 mm/3.0 mm/3.5 mm)	VAR-8941BB
BB-Tak, large, threaded 1.6 mm × 50 mm (2.4 mm/3.0 mm/3.5 mm)	VAR-8941TBB
Guidewire w/ trocar tip, 1.1 mm × 150 mm (2.4 mm/3.0 mm)	VAR-8933K
<b>Instruments for 3.5 mm/4.0 mm OrthoLine Plating System (Matte)</b>	
Drill bit, solid, short, AO, 2.4 mm (3.5 mm Cortical)	VAR-8943-30
Drill bit, solid, AO, 2.8 mm (3.5 mm Locking)	VAR-4035D
Drill bit, solid, AO, 3.5 mm (4.0 mm)	VAR-4040D
Depth measuring device (2.7 mm/3.0 mm/3.5 mm/4.0 mm)	VAR-8943-15
T15 driver (3.5 mm)	VAR-8941DH
T15 screwdriver (3.5 mm)	VAR-8943-10
Screw holding forceps	VAR-8941F
Drill/depth guide, locking, 3.5 mm (3.5 mm)	VAR-4035DG
Drill/depth guide, locking, 4.0 mm (3.5 mm)	VAR-4040DG
Drill guide (3.5 mm)	VAR-8943-14
1.3 mm K-wire drill guide, locking, 3.5 mm	VAR-4035KDG
Bending iron, large (3.5 mm/3.5 mm broad)	VAR-4000-09
BB-Tak, large 1.6 mm × 50 mm (2.4 mm/3.0 mm/3.5 mm)	VAR-8941BB
BB-Tak, large, threaded 1.6 mm × 50 mm (2.4 mm/3.0 mm/3.5 mm)	VAR-8941TBB
Guidewire w/ trocar tip, 1.3 mm × 150 mm (3.5 mm)	VAR-8937K

## Fracture Reduction Instruments

Product Description	Item Number
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
Needlenose pliers	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

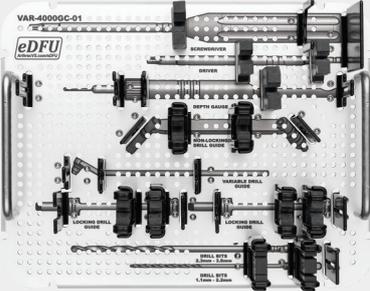
## Optional Instruments

Product Description	Item Number
Mini joint distractor/compressor	AR-8970JD
Guidewire w/ trocar tip 0.092 in × 8 in	VAR-8967K
Guidewire w/ Trocar tip 0.62 in	VAR-8941K
Threaded guidewire w/ trocar tip 0.62 in	AR-8941KT



Mini joint  
distractor/  
compressor,  
AR-8970JD

Cases and Caddies

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

## Cases and Caddies

Image	Product Description	Item Number
 <p>The image shows a black, rectangular screw caddy with a grid of holes. A matching black lid is placed to the right, featuring the Arthrex logo and 'eDFU' branding.</p>	<p>3.0 mm Screw caddy</p>	<p>VAR-3030SC-01</p>
 <p>The image shows a black, rectangular screw caddy with a grid of holes. A matching black lid is placed to the right, featuring the Arthrex logo and 'eDFU' branding.</p>	<p>3.5 mm/4.0 mm Screw caddy</p>	<p>VAR-4035SC-02</p>
 <p>The image shows a black, rectangular bending plug caddy with a grid of holes. A matching black lid is placed to the left, featuring the Arthrex logo.</p>	<p>Bending plug caddy</p>	<p>VAR-4000BPC</p>





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.

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