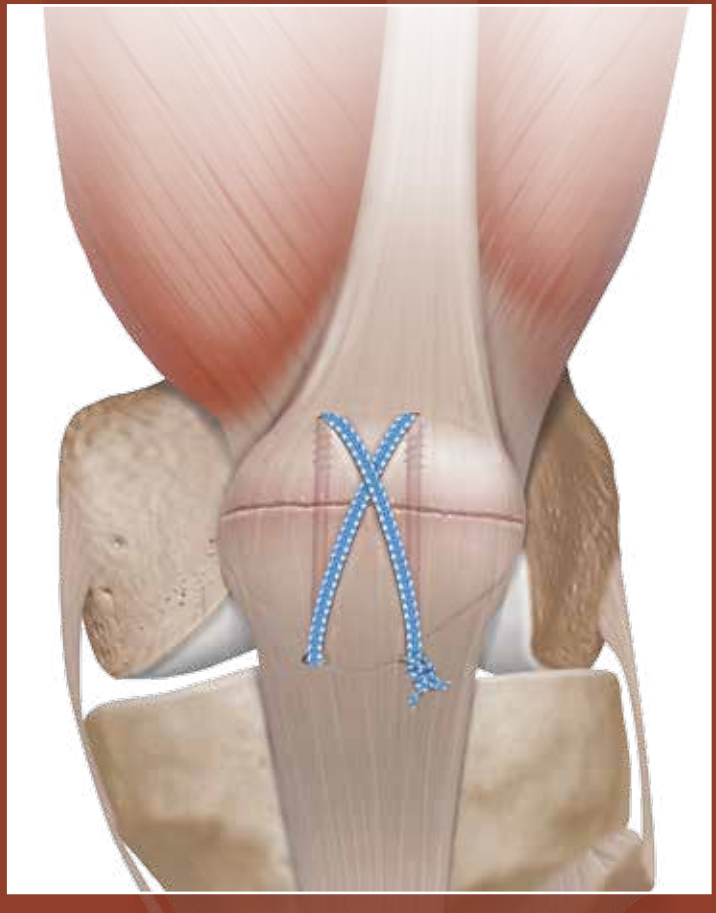
Arthrex®

Patella Fracture System

Surgical Technique



# Patella Fracture System

# Introduction

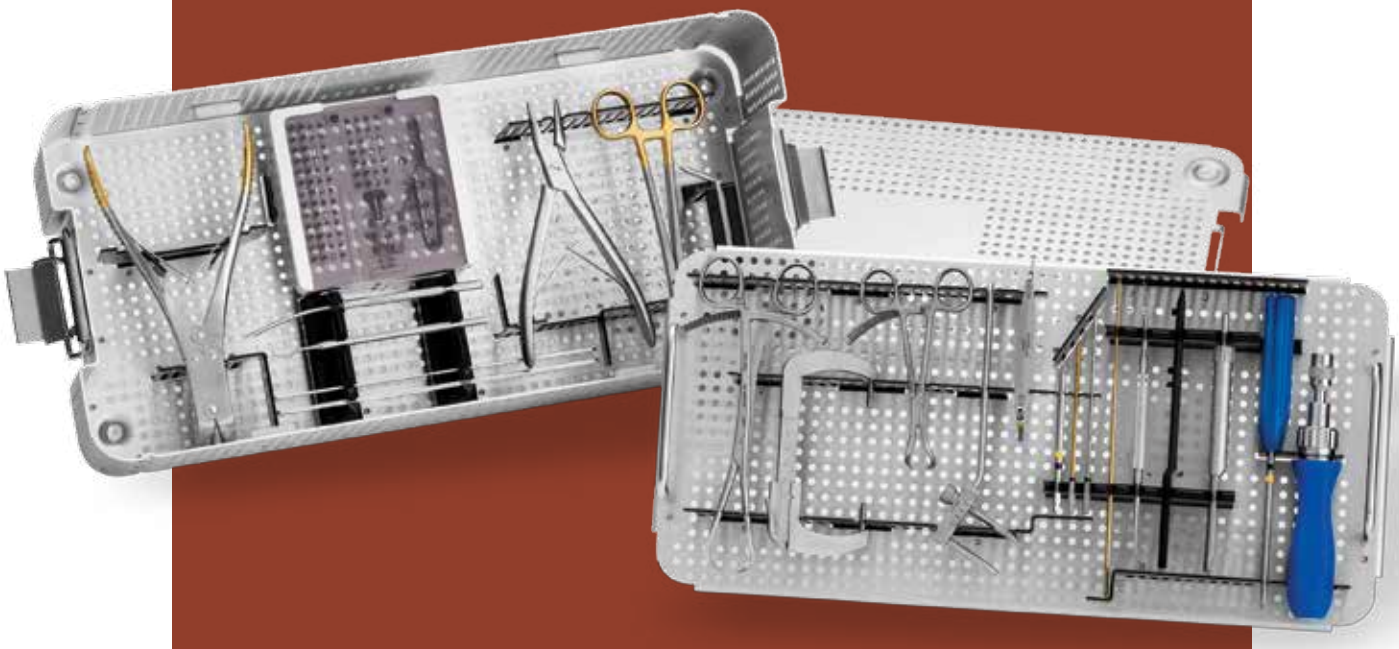
Patella fractures represent approximately 1% of all fractures. They present with a variety of fracture patterns, which can make osteosynthesis challenging. The amount of comminution, degree of osteoporosis, and the natural forces across the patella create obstacles to reduction and adequate stabilization. The Patella Fracture Set was designed to facilitate fixation of these frequently challenging injuries.

Included in the set are 4.0 mm Blunt Tip Cannulated Lag Screws. Once in place, FiberTape® suture on a specially designed 5" needle can easily be passed though the screws, allowing for tension-band fixation. The smooth tips of the screws were specifically designed to avoid cutting the FiberTape. This construct has been shown to be stronger than traditional K-wire with cerclage wire constructs.*

Also included in the set is everything needed to perform a traditional repair with K-wires and cerclage wire. Innovative instruments are included along with Sternal Wire Drivers, Weber Clamps, Drill Guides, and Stout Wire Cutters to give surgeons all the instruments needed in one convenient set. Unique to this set is an adjustable Parallel Offset Guide, a C-ring Drill Guide with an incorporated measurement device, and a Cerclage Wire Passer to effectively pass wire through the quad and patellar tendons.

With new instrumentation and implants to facilitate treatment of a variety of fracture patterns, the Patella Fracture System sets a new standard in patella fracture management.

*Data on file



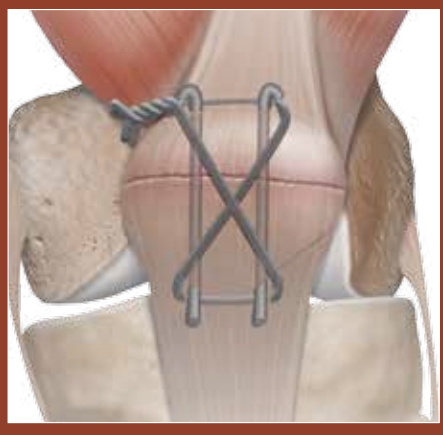
AR- 5050S – Patella Fracture System

## Transverse Patella Fractures

For displaced fractures that require surgery, transverse fractures are the most commonly seen.

These fractures are most often fixed in place with parallel K-wires or screws across the fracture, often with the addition of a cerclage wire/tension band. The figure-of-eight band translates the anterior forces into compressive forces.

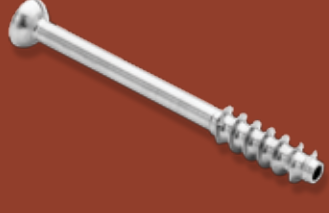
In some cases, these wires and pins will need to be removed about a year or two after the surgery due to prominence and patient discomfort.



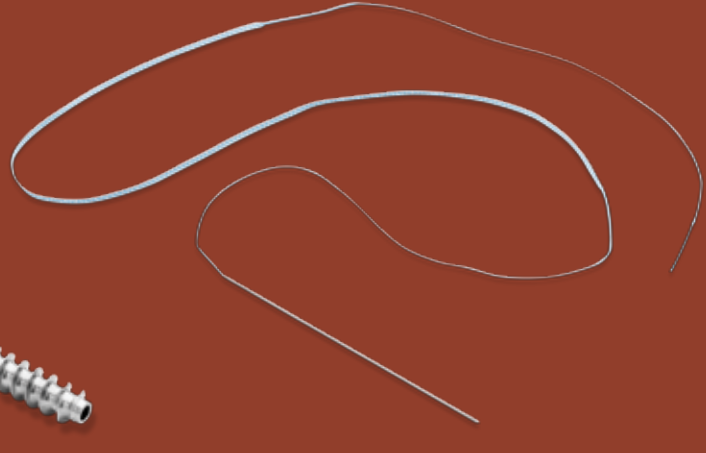
## The Arthrex® Solution

The 4 mm Blunt Tip Cannulated Lag Screws were designed specifically for patella fractures. In addition, FiberTape® suture has been attached to 5" needles designed to pass through the screws, subsequently allowing for its use as a tension band.

This construct has been shown to be stronger than the traditional method described above.* The technique is associated with less prominent hardware.

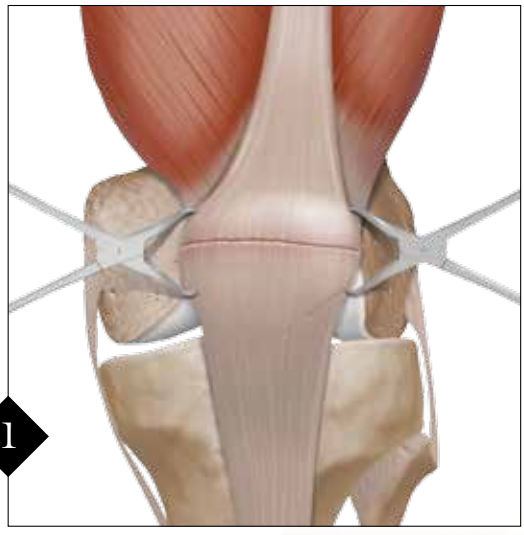


*Blunt Tip Cannulated Lag Screws*
*AR-5051-XX (24 mm–60 mm)*

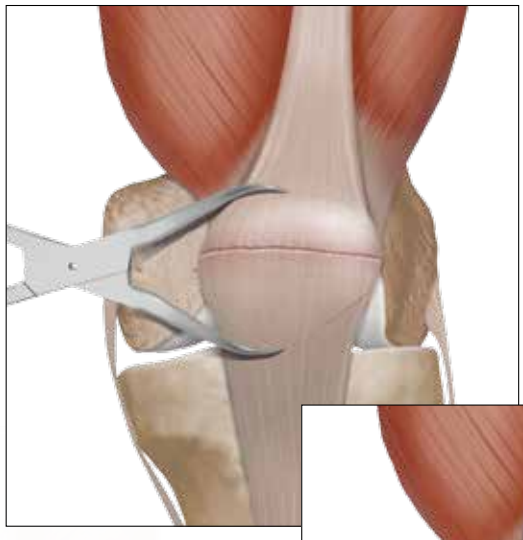


*FiberTape® w/Needle, 17"*
*AR-7237-17LN*

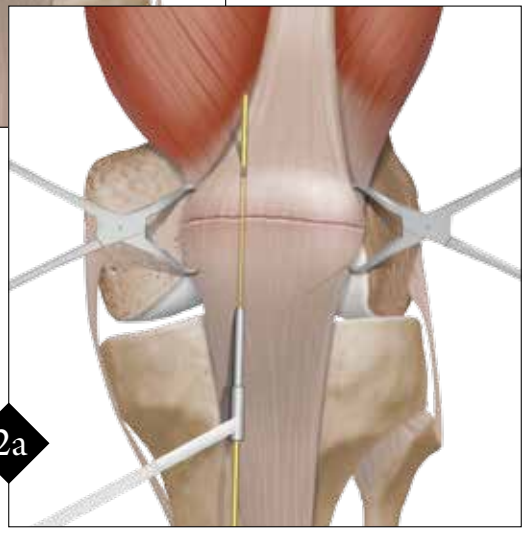
*data on file.



1

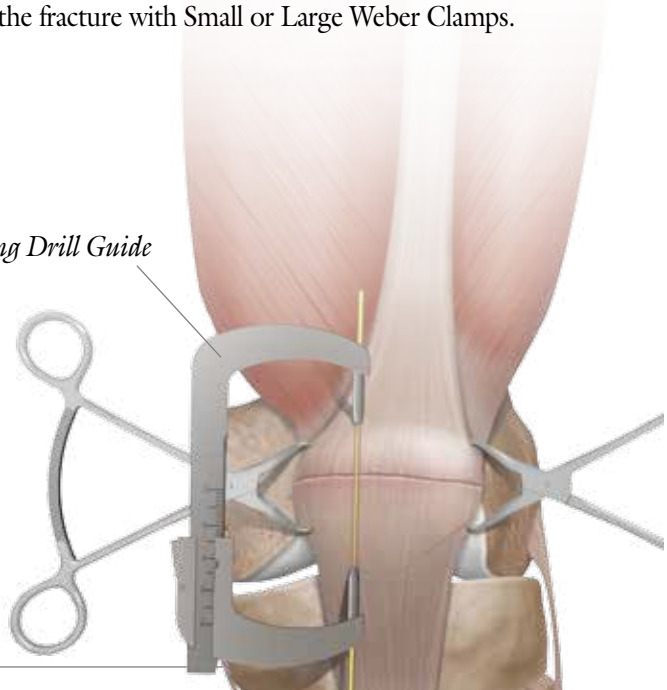


Reduce the fracture with Small or Large Weber Clamps.



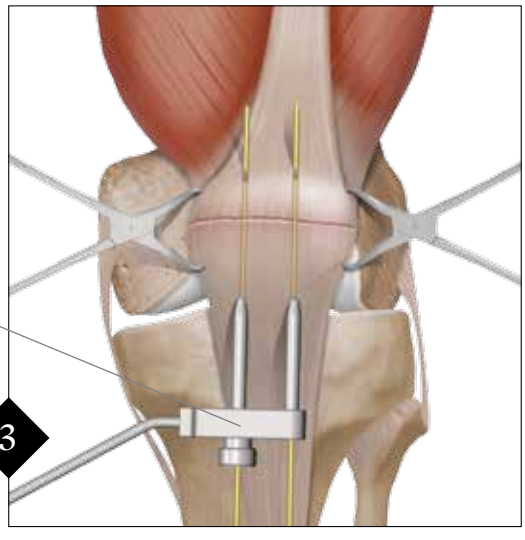
2a

Alternately, a traditional 1.35 mm Drill Guide can be used.




2

Place a 1.35 mm Guidewire across the reduced fracture. The C-ring Drill Guide can be used to place each individual wire. The C-ring guide also acts as a clamp to compress the bone fragments, and a measurement device to help determine screw length when drilling the K-wire. Although this guide is designed to capture the wire through the distal sleeve, it is not uncommon nor problematic for the thin wire to slightly veer off course.



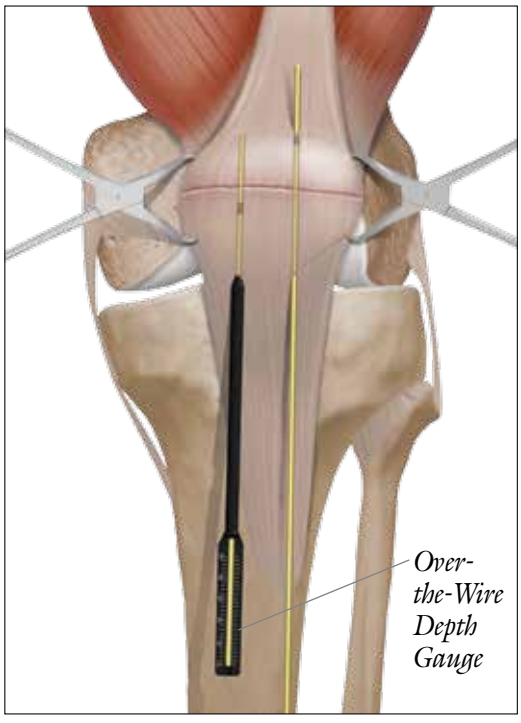

3

A second guidewire is drilled parallel to the first. The Parallel Offset Guide can be used to help accurately place both wires.

The ideal level for the wires lies approximately 5 mm below the anterior patellar surface. Variable anatomy or fracture pattern may dictate otherwise. Nevertheless, the principle of tension banding is not compromised. The position of the wires may be checked with fluoroscopy at this stage before proceeding to insert the screws.

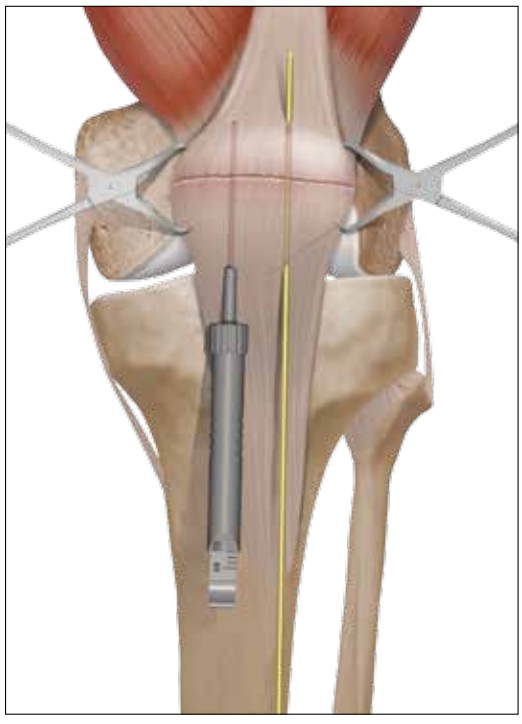
## Measure for Screw Length

### *Measurement Option One*



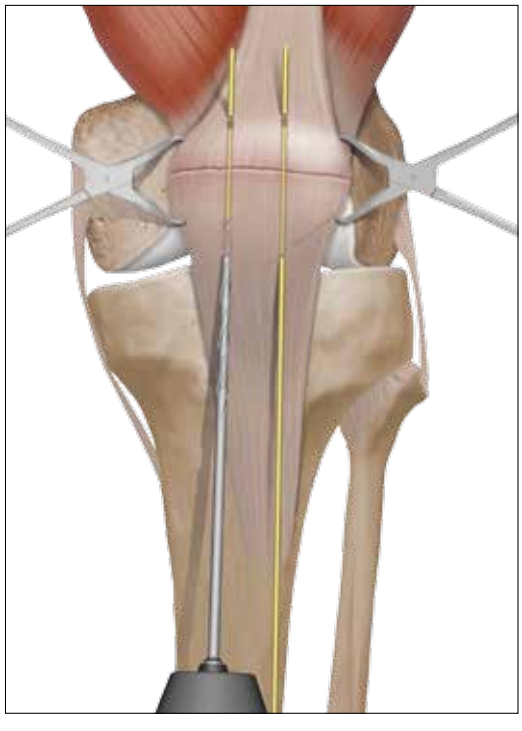

Before drilling, place the tip of the 1.35 mm Guidewire at the far edge of the bone. Use the Over-the-Wire Depth Gauge to determine appropriate screw length. There is a black laser mark on the guidewire for this purpose. ***Note: Subtract 4 mm from measurement length. This insures screws are left short when fracture is lagged together.***

### *Measurement Option Two*



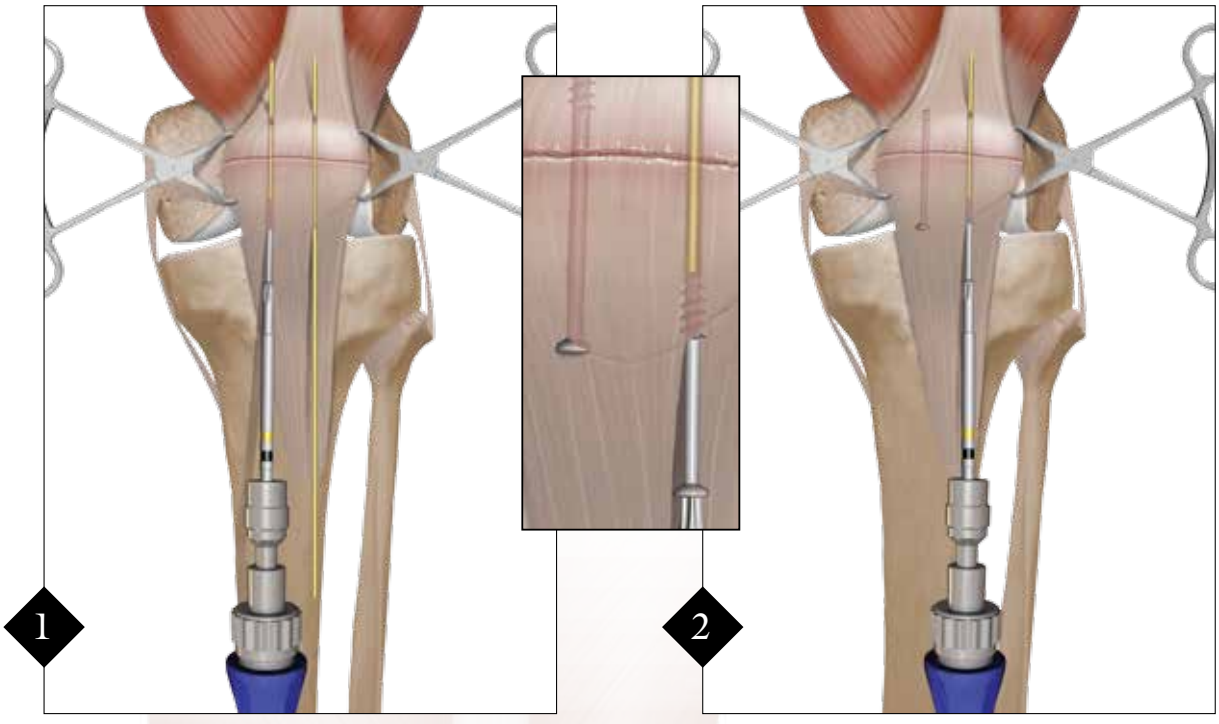
After drilling, remove the guidewire and use the Hooking Depth Gauge to determine appropriate screw lengths. The guidewire should be reinserted to place the screws.

### *Drilling*

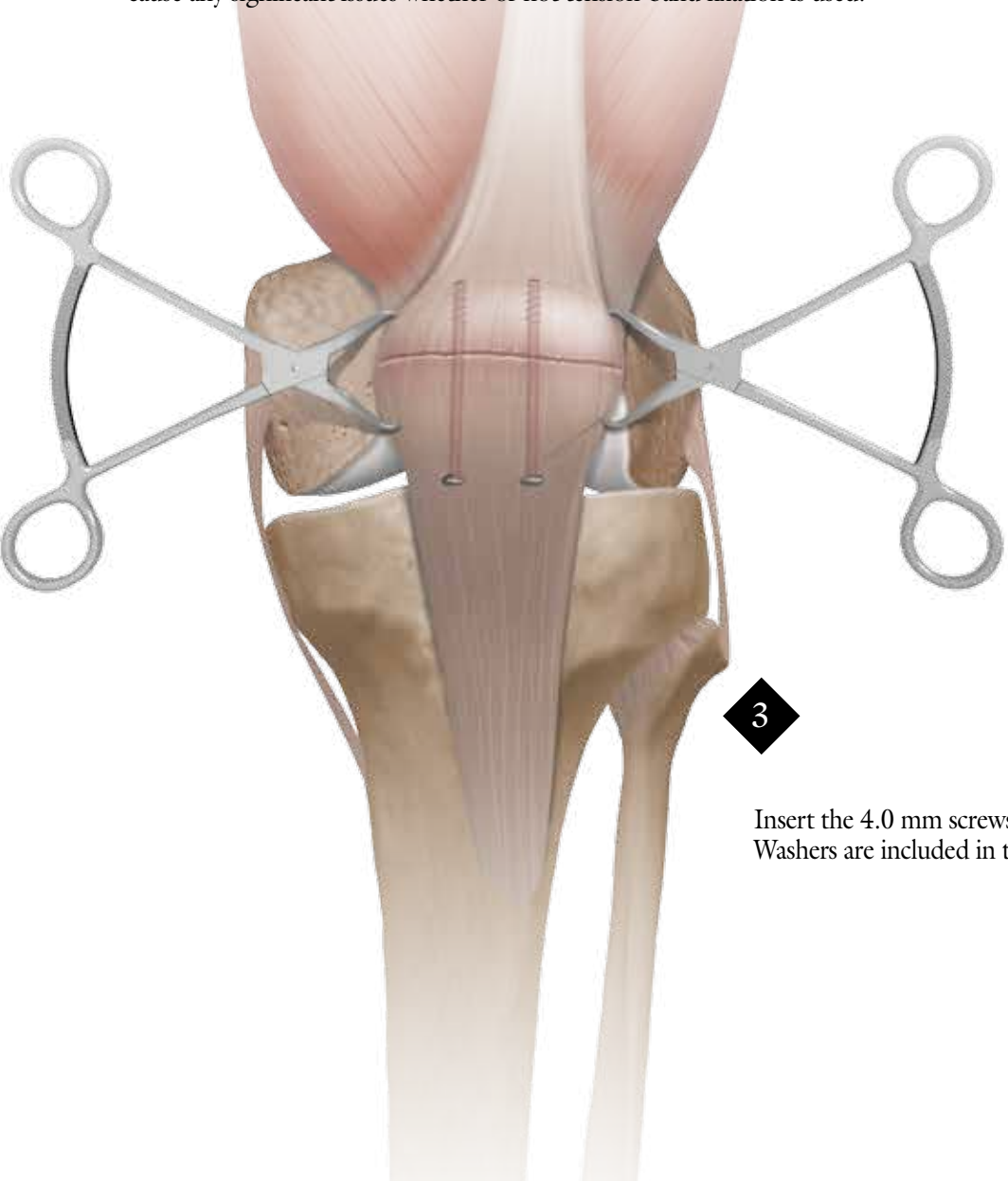


Once the guidewires are in place, ream over them with the 2.6 mm Cannulated Drill. Pass the reamer all the way through the bone. A 4.0 mm Screw Tap is provided.

## Screw Placement

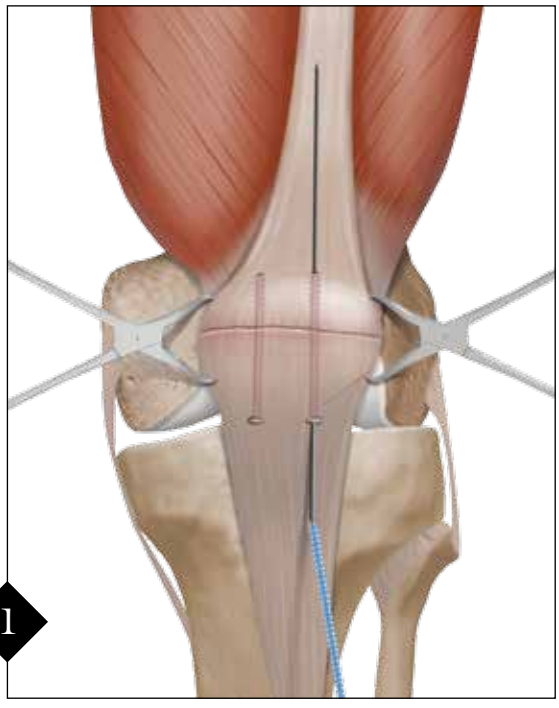


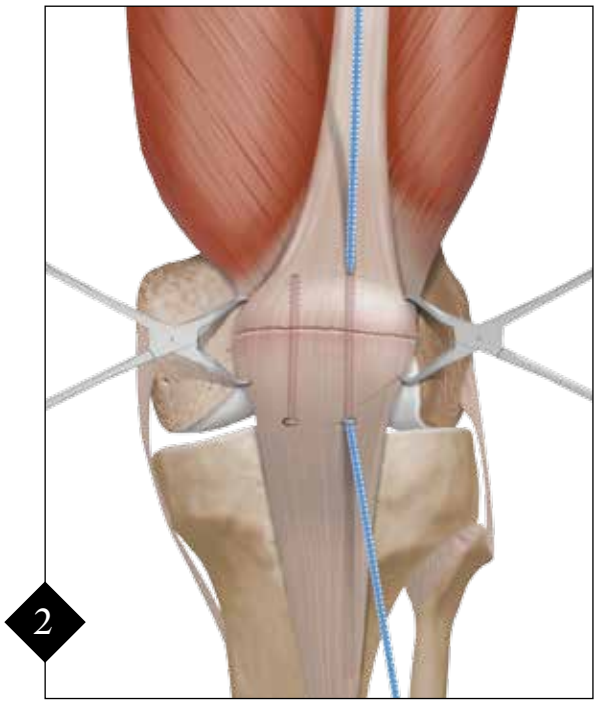

Insert the appropriate length 4.0 mm Blunt Tip Cannulated Lag Screws over each guidewire. If possible, the threaded portion of the screw should bypass the fracture line to allow for compression. Ideally, the screw length should be just short of the far cortex. However, due to the blunt tip design, screws that are too long should not cause any significant issues whether or not tension-band fixation is used.



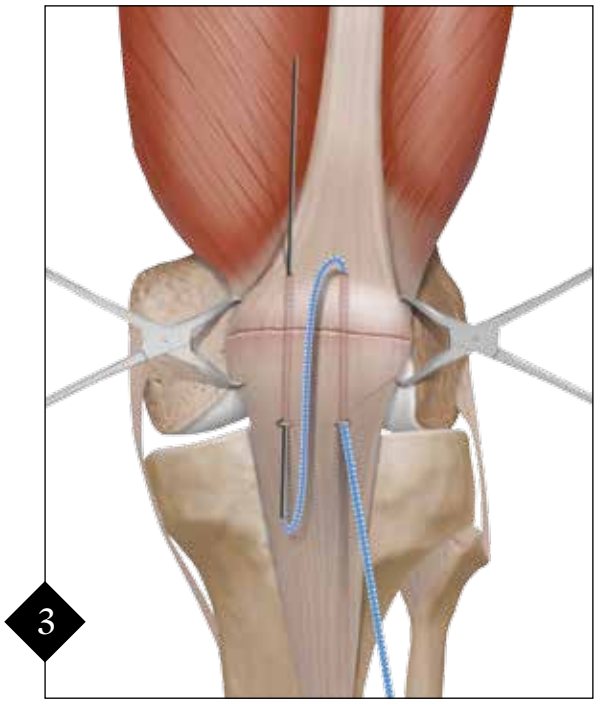

Insert the 4.0 mm screws until fully seated. Washers are included in the set, if necessary.

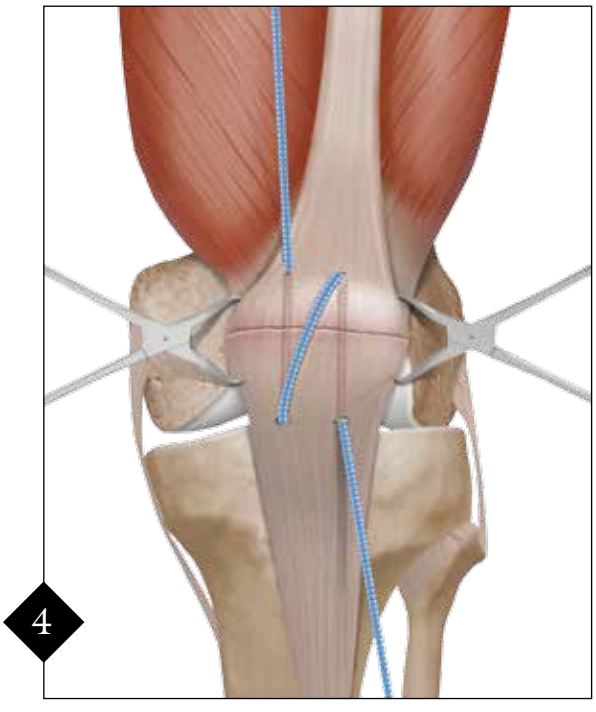
## Tension Band with FiberTape® Suture



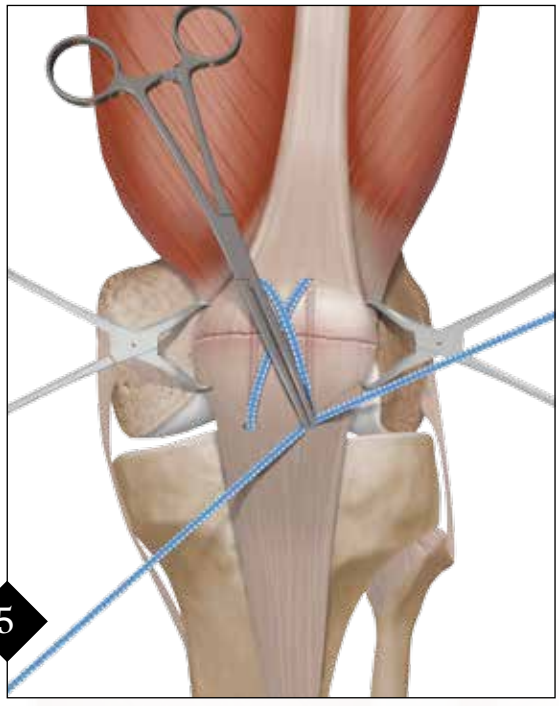




Pass the 5" needle with FiberTape through one of the 4.0 mm Cannulated Lag Screws.



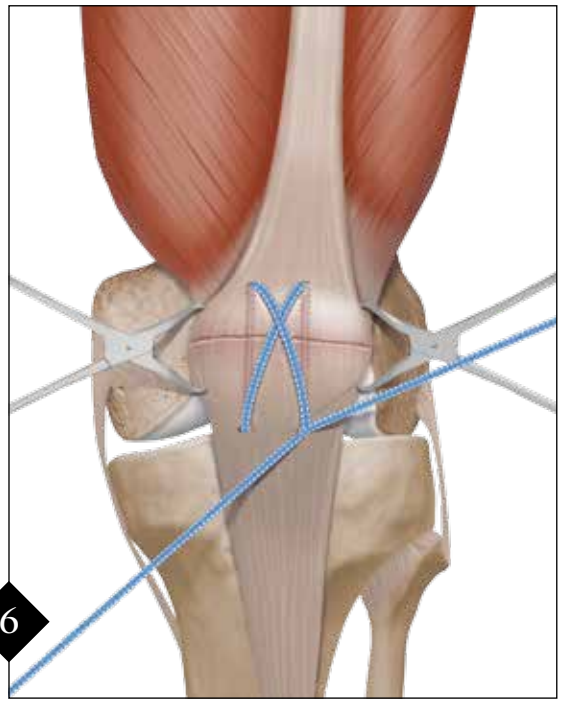




Cross the FiberTape over the anterior face of the patella and pass the needle through the second 4.0 mm screw.



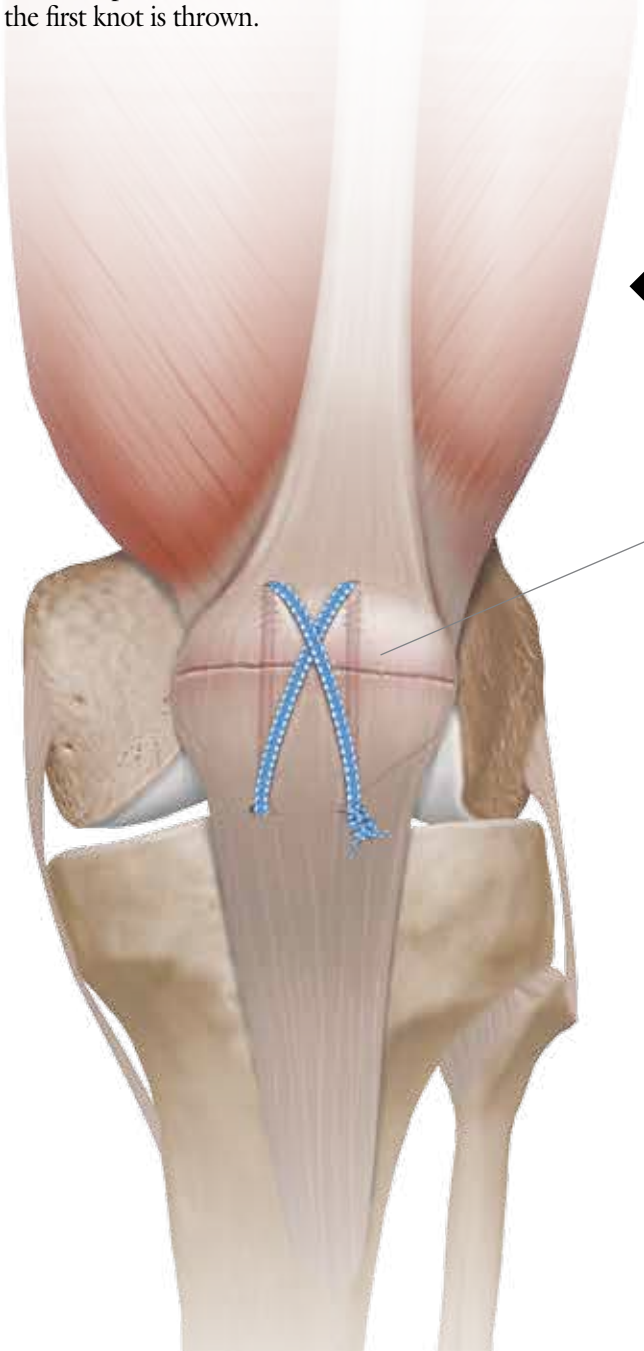
5

The FiberTape® suture can be held with a hemostat as the first knot is thrown.



6

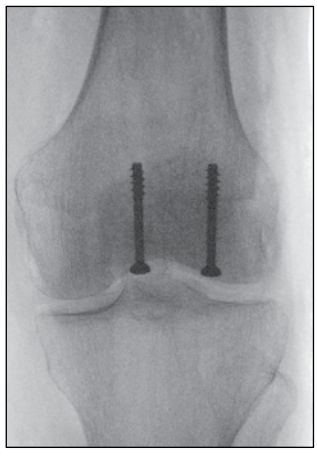
Complete the figure-of-eight pattern by tying the two ends of the FiberTape together. If possible, place the knot stack proximally or distally, rather than on the anterior surface of the patella.

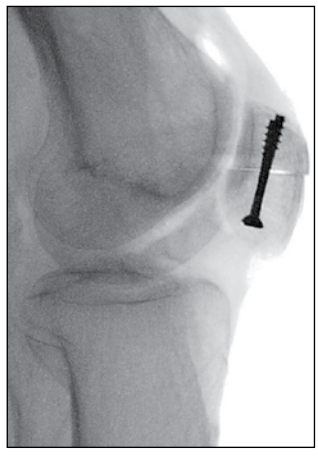


7

Four to five throws are recommended when tying the knot. A short, 5-10 mm tail allows the surgeon to direct the path of the knot bed.

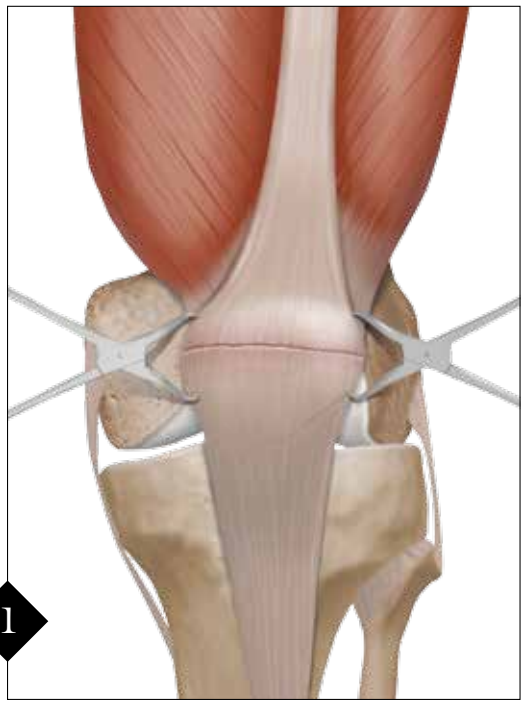
*Patella fracture secured with two Blunt Tip Cannulated Lag Screws and FiberTape tension band.*





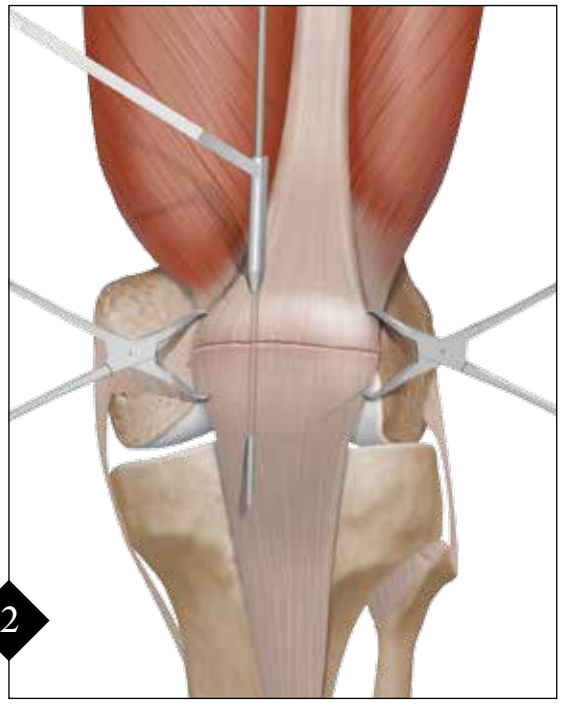
***X-rays showing the completed osteosynthesis***

## *K-wires and Cerclage Wire Tension Band for Transverse Fractures*



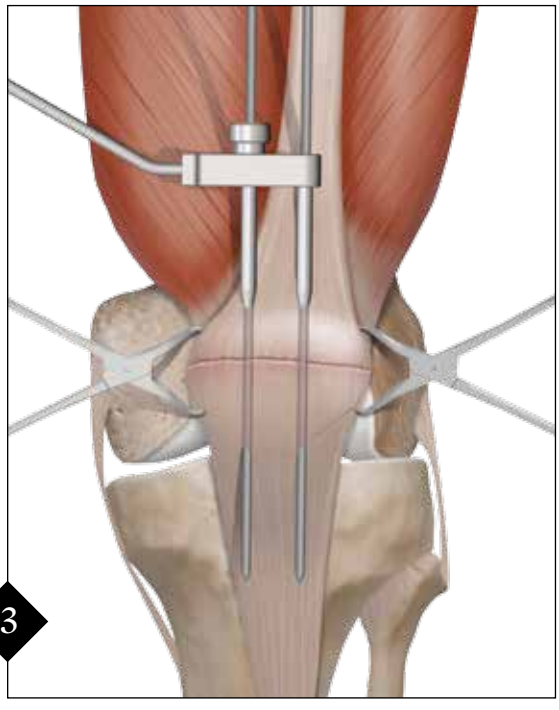
1

Manually reduce the fractures with Large or Small Weber Clamps.



2

Place a 1.6 mm or 2 mm K-wire across the reduced fracture. The 1.6 mm/2.0 mm Drill Guide can be used to place each individual wire. ***Note: K-wires can be inserted from proximal or distal poles.***

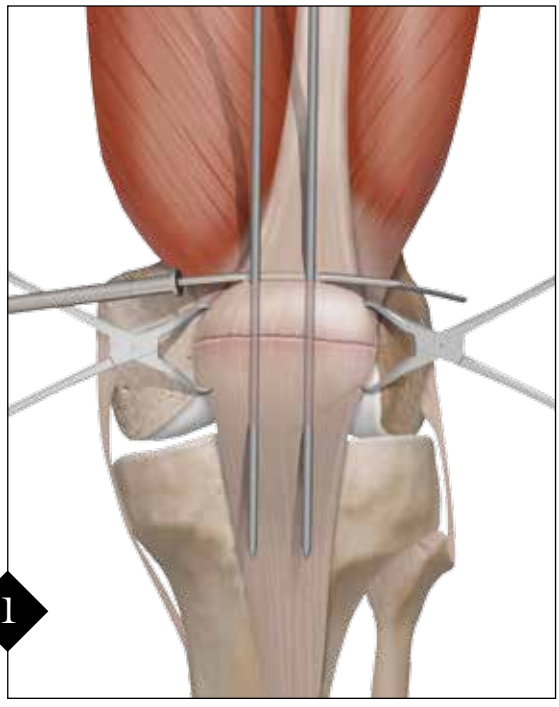


3

A second K-wire is drilled parallel to the first. The Parallel Offset Guide can be used to help accurately place both wires.

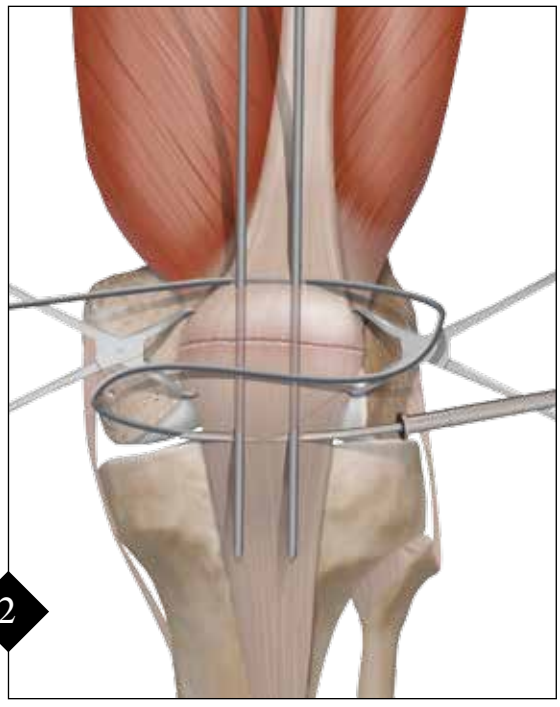
The ideal level for the wires lies approximately 5 mm below the anterior patellar surface. Variable anatomy or fracture pattern may dictate otherwise. Nevertheless, the principle of tension-banding is not compromised. The position of the wires may be checked with fluoroscopy at this stage before proceeding to insert the screws.

## Tension Band Insertion



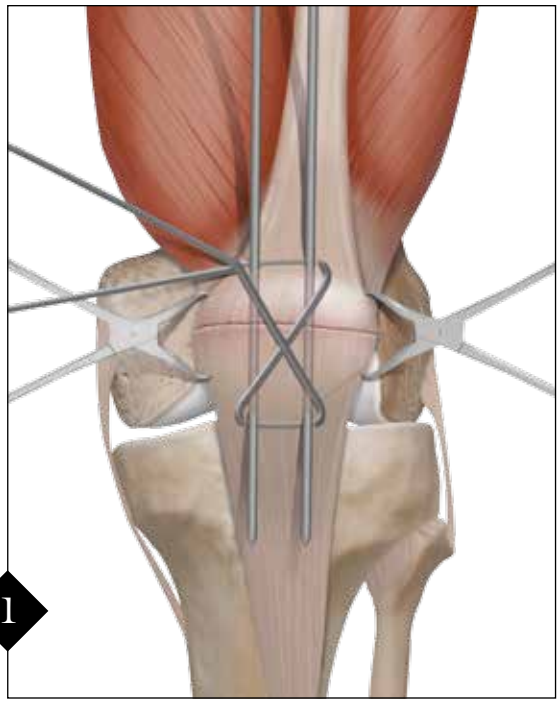

Insert the specially designed Cerclage Wire Passer through the quadriceps tendon immediately posterior to the K-wires, and adjacent to the superior pole of the patella.

Pass the cerclage wire through the Cerclage Wire Passer. Once the wire is through, remove the Cerclage Wire Passer.

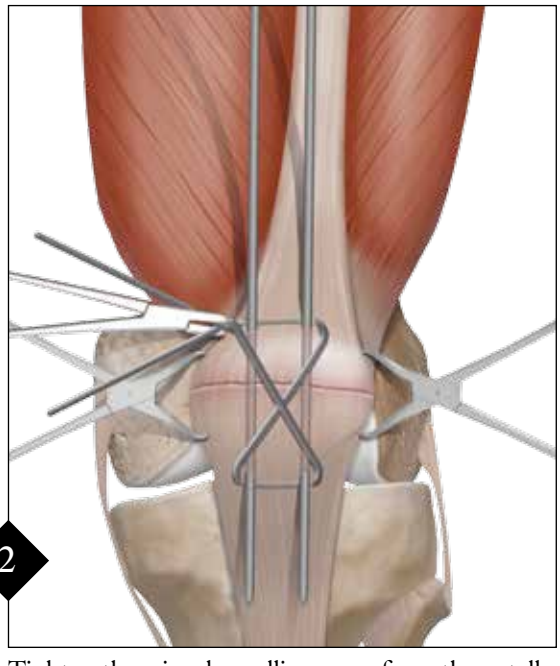



Cross the cerclage wire over the anterior surface of the patella. Insert the Cerclage Wire Passer through the patellar tendon, again staying as close as possible to the bone and K-wires. Pass the cerclage wire through the pointed side of the Cerclage Wire Passer. This will allow for the removal of the Cerclage Wire Passer toward the handle side.

## Applying the Cerclage Wire



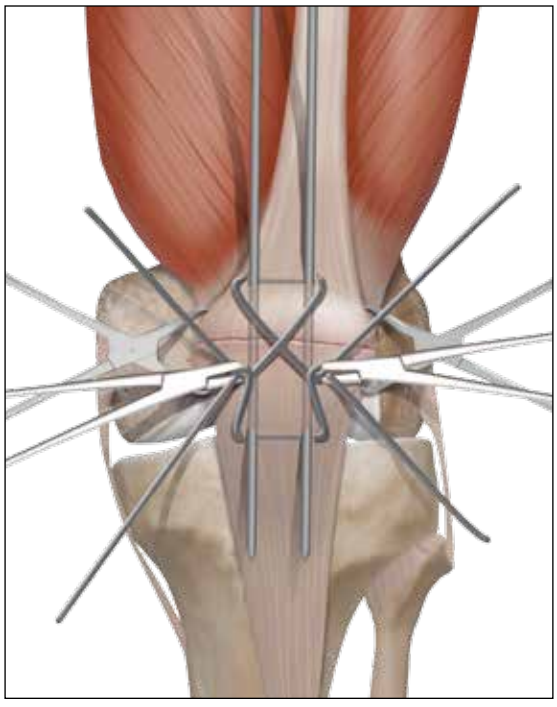

Cross the anterior face of the patella again, creating a figure-of-eight pattern.



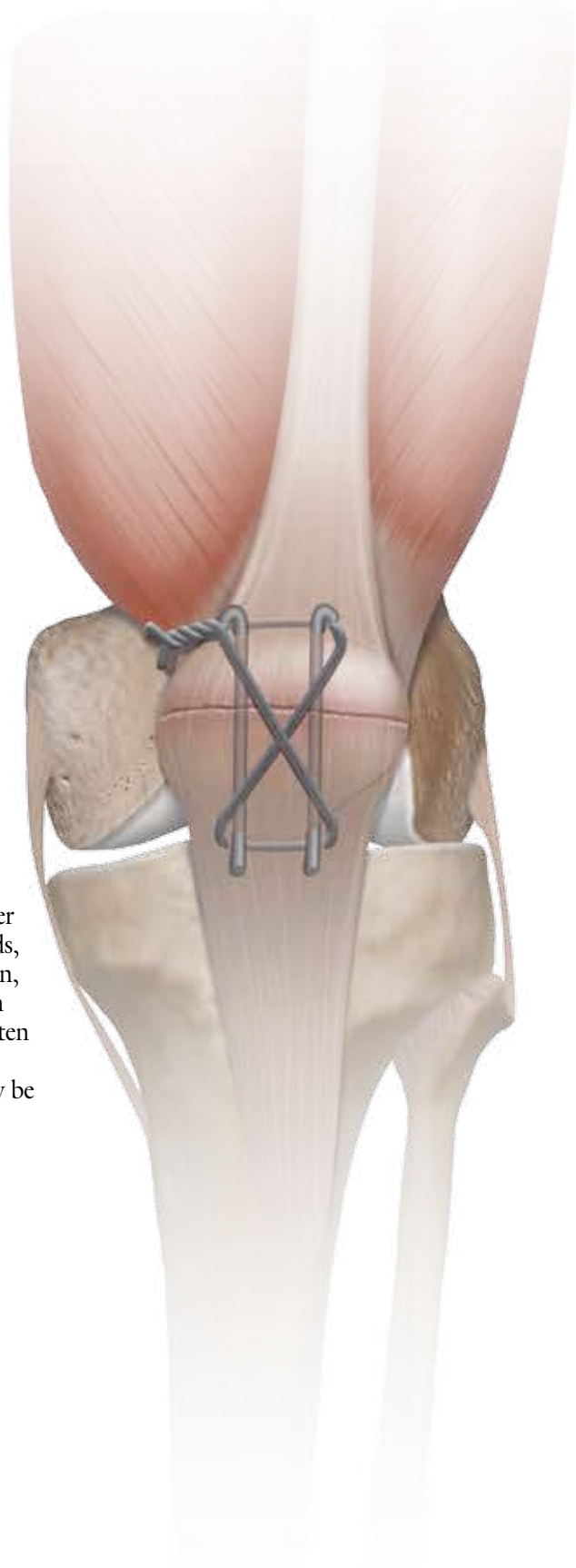

Tighten the wires by pulling away from the patella as the wires are twisted.

The wires should be twisted at least five times in order to prevent fixation failure. When stainless steel wires tighten, they will lose their surface sheen. If tightened further, the wire may break.

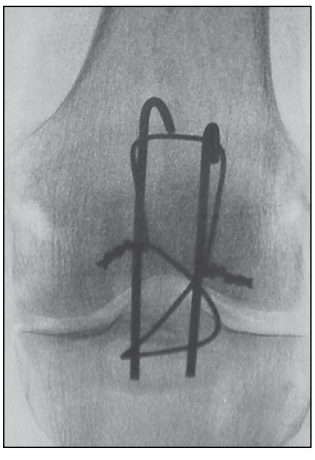
Care should be taken to position the twisted wire into deeper soft tissue layers, if possible.

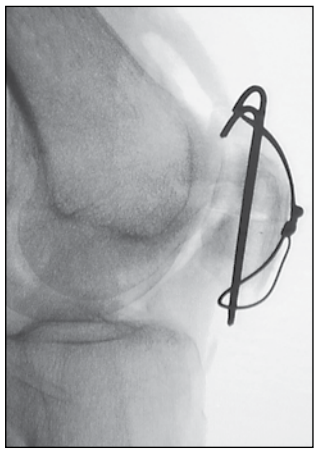


***Alternatively***, two wires can be used. One wire is passed through the patellar tendon and one through the quadriceps tendon using the Cerclage Wire Passer. They are crossed on the anterior face of the patella and twisted together using the Sternal Wire Driver to create compression. Cut the excess wire and bend down to reduce soft tissue irritation.

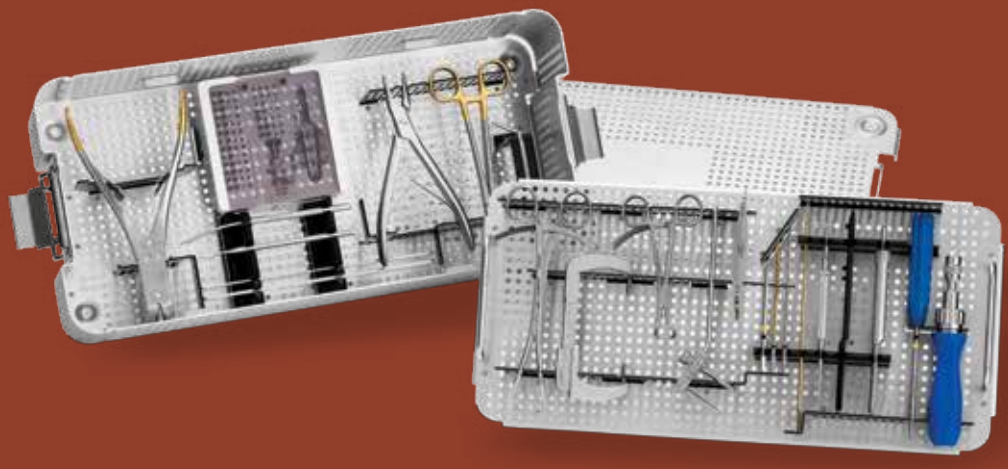


Check the reduction of the articular surface by palpating the retropatellar surface through the reticular tears. After tightening the cerclage wire, bend the proximal pin ends, shorten them, turn them towards the quadriceps tendon, and drive them into the patella to prevent skin irritation and loosening. The distal pin ends are trimmed to shorten the wires appropriately. Bending the wires at both ends may prevent wire migration, but hardware removal may be more difficult. This is left to surgeon discretion.

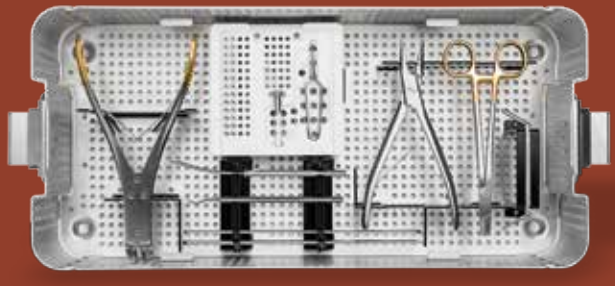




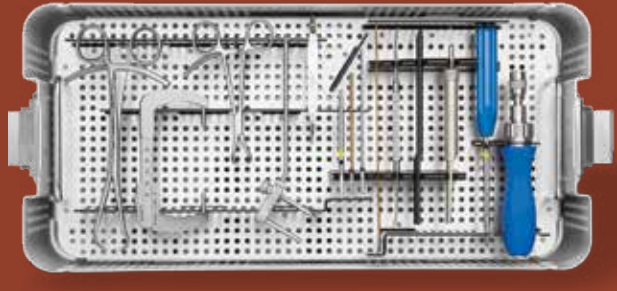
***X-rays showing the completed osteosynthesis***



AR- 5050S – Patella Fracture System

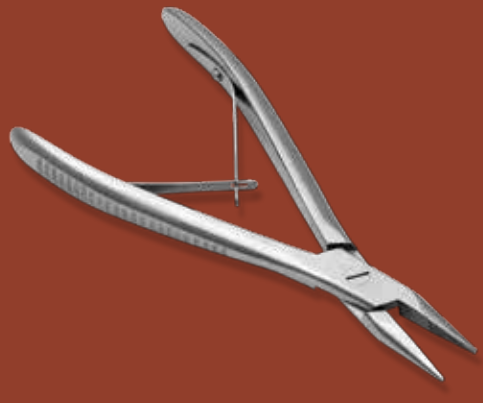


AR- 5050C – Patella Fracture System Case



2x Sternal Wire Driver
AR-5050-04

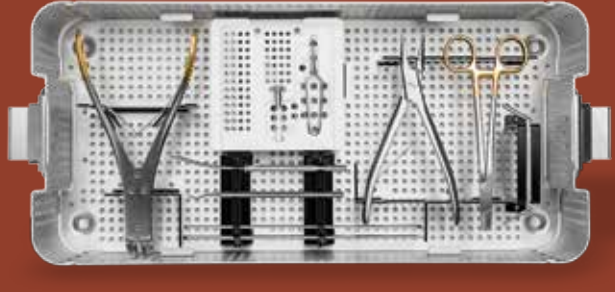
Stout Wire Cutters
AR-5050-08



Medium Length Pliers
AR-5050-09

Screw Forceps
AR-8941F

Screw Holding Sleeve
AR-8943-11

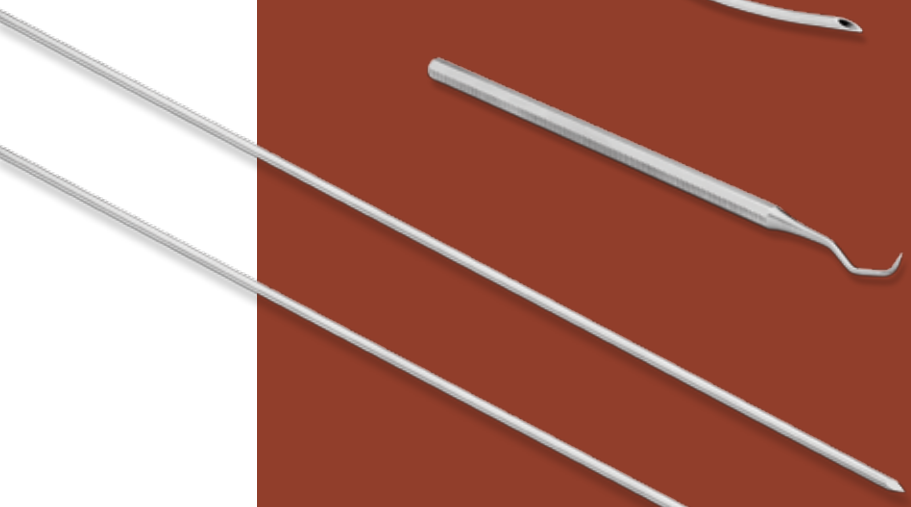


Level 1
Instruments in Case

Cerclage Wire Passer
AR-5050-10



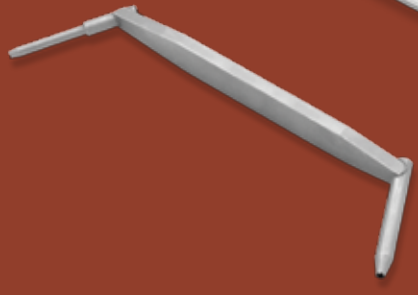
Sharp Hook
AR-8943-21



Steinmann Pin, 1.6 mm
AR-5050K-1



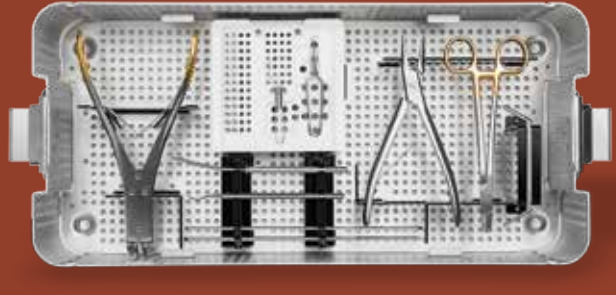
Steinmann Pin, 2.0 mm
AR-5050K-2



Drill Guide, 1.6/2.0 mm
AR-5050-07

4.0 mm Blunt Tip
Cannulated Lag Screws
AR-5051-XX (24-60 mm)

Washer
AR-8870W



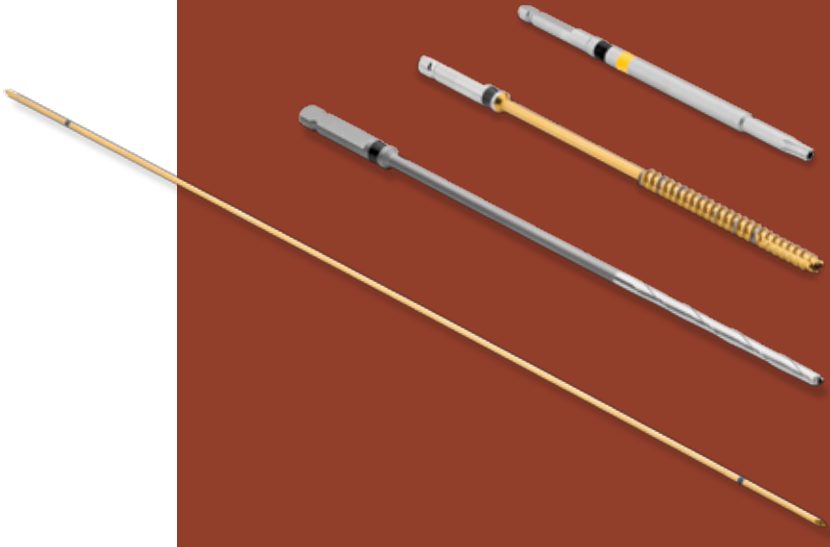
Level 1
Instruments in Case

Cannulated Screw Driver
w/rigidly attached handle
AR-8943-09

Cannulated Driver Handle, AO
AR-5050-03

2x Large Weber Clamps
AR-8943-24

2x Small Weber Clamps
long throw
AR-5050-05

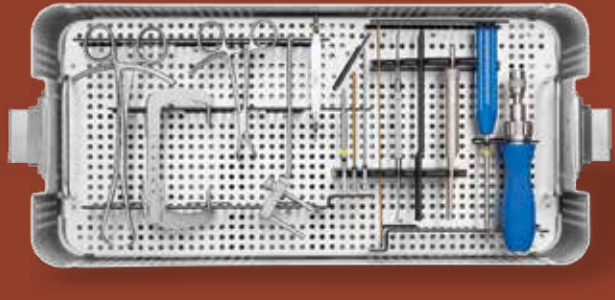


Cannulated Screw Driver, AO
AR-8943-12

4.0 mm Screw Tap
AR-8943-06

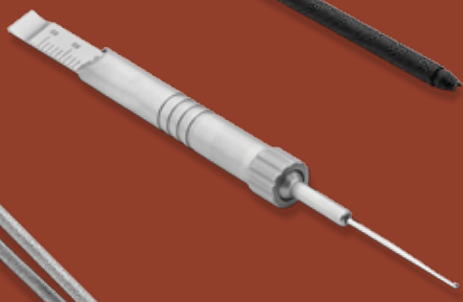
2.6 mm Cannulated Drill
AR-8943-02

ø1.35 mm Guidewire
AR-5050-01

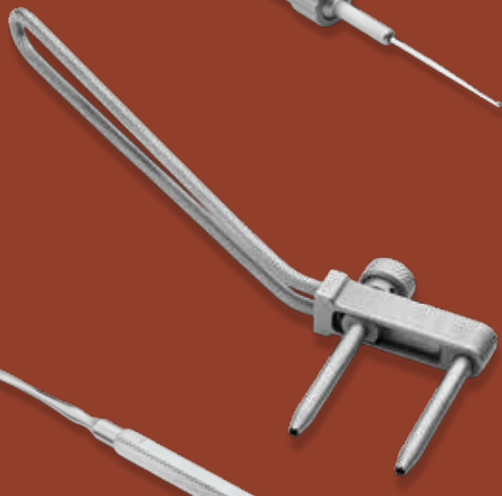


Level 2
Instruments in Case

Drill Guide, 1.35/2.6 mm
AR-8943-03



Over-the-Wire Depth Gauge
AR-5050-02



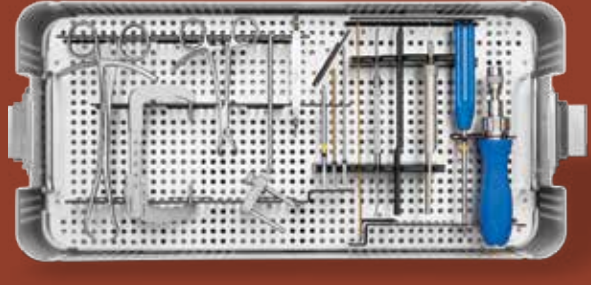
Hooking Depth Gauge
AR-8943-15

Parallel Offset Guide, 2.0 mm
AR-5050-11



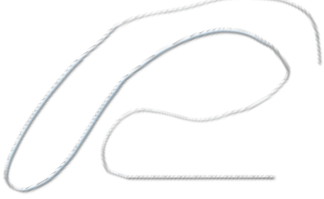
Freer Elevator
AR-8943-19

C-ring Drill Guide
AR-5050-06



Level 2
Instruments in Case

## Ordering Information

| IMPLANTS | LENGTH | PRODUCT # | RECOMMENDED SET CONTENT – AR-5050S |
|---|---|---|---|
| 4.0 mm Blunt Tip Cannulated Lag Screws | | | |
|  | 24 mm | AR-5051-24 | 4 |
| | 26 mm | AR-5051-26 | 4 |
| | 28 mm | AR-5051-28 | 4 |
| | 30 mm | AR-5051-30 | 4 |
| | 32 mm | AR-5051-32 | 4 |
| | 34 mm | AR-5051-34 | 4 |
| | 36 mm | AR-5051-36 | 4 |
| | 38 mm | AR-5051-38 | 4 |
| | 40 mm | AR-5051-40 | 4 |
| | 42 mm | AR-5051-42 | 4 |
| | 44 mm | AR-5051-44 | 4 |
| | 46 mm | AR-5051-46 | 4 |
| | 48 mm | AR-5051-48 | 4 |
| | 50 mm | AR-5051-50 | 4 |
| | 55 mm | AR-5051-55 | 4 |
| | 60 mm | AR-5051-60 | 4 |
| | DIAMETER | | |
| ø2.0 mm Steinmann Pin | | | |
|  | 2.0 mm | AR-5050K-2 | 4 |
| ø1.6 mm K-wire | | | |
|  | 1.6 mm | AR-5050K-1 | 4 |
| ø1.35 mm Guidewire | | | |
|  | 1.35 mm | AR-5050-01 | 4 |
| Washer | | | |
|  | - | AR-8870W | 6 |
| FiberTape w/Needle, 17" | | | |
|  | - | AR-7237-17LN | - |

*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.*

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