



SURGICAL TECHNIQUE

## **Canine Cranial Cruciate Ligament Repair Anchor System**



# The Arthrex Difference

Since 1984, Arthrex has been a privately held corporation committed to just one thing: providing the finest quality products and educational services to meet the special needs of surgeons and their patients. Arthrex has a focused dedication to creative product development and medical education with an experienced, devoted team of professionals who are truly committed to continuing this long-term tradition.

Our goal is to make technically demanding surgical procedures easier, safer and reproducible. Your trust in Arthrex products means you are backed by a company committed to uncompromising quality and constant product innovation.

## Suture Tensioner with Tensiometer

The redesigned Suture Tensioner allows the surgeon to quickly set and control the desired tension on FiberWire® and FiberTape® sutures. The open design allows for better visualization of the suture during suture capture and the easy-to-read tension markings allow the surgeon to accurately dial in the appropriate tension setting. Once the desired amount of tension/reduction is achieved, half-hitches can be thrown down the shaft of the tensioner to secure the fixation

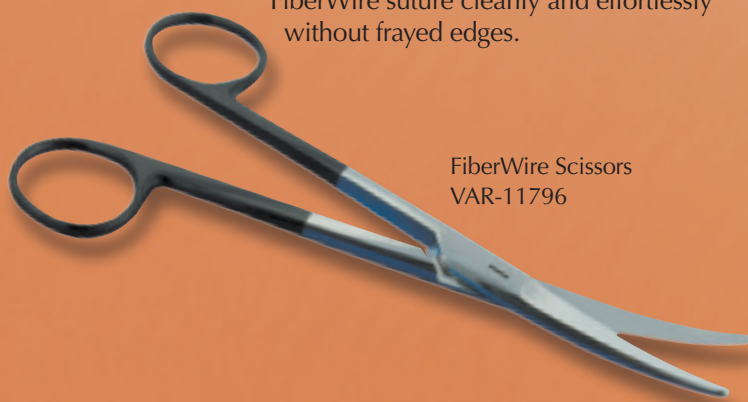
Autoclavable for quick cleaning



Suture Tensioner with Tensiometer VAR-1529

## FiberWire Scissors

FiberWire Scissors were designed to cut any size or style suture, especially FiberWire suture, in open surgical cases where an arthroscopic suture cutter is not necessary. With its specially designed cutting edges, it can cut FiberWire suture cleanly and effortlessly without frayed edges.



FiberWire Scissors VAR-11796

# Revolutionizing Orthopedic Surgery

FiberWire suture is constructed of a multi-stranded, long chain ultra-high-molecular-weight polyethylene (UHMWPE) core with a polyester braided jacket which gives it superior strength, soft feel and abrasion resistance, unequaled in orthopedic surgery. Suture breakage during knot tying is virtually eliminated, which is especially critical during arthroscopic procedures. FiberWire suture represents a major advancement in orthopedic surgery.

## Strength

FiberWire suture has greater strength than comparable size polyester suture. Multiple independent scientific studies document significant increases in strength-to-failure, stiffness, knot strength and knot slippage with much less elongation.<sup>1</sup>

## Tie Ability and Knot Profile

Superior strength allows tighter loop security during knot tying, increasing knot integrity while reducing the knot profile compared to polyester suture.

## Abrasion-Resistance

The multi-strand, long-chain UHMWPE core dramatically increases FiberWire suture's abrasion resistance. Surgical procedures that create bone edges, tunnel edges, and articulating surface abrasion areas are appropriate indications for FiberWire suture. FiberWire suture is over 5 times more abrasion resistant than polyester suture.

## Safety in Numbers

Trusted by leading orthopedic surgeons worldwide since its introduction in 2002, FiberWire suture has contributed to successful outcomes in over 1 million orthopedic surgical procedures. Extensive biocompatibility, animal and clinical testing proves that FiberWire suture demonstrates biocompatibility characteristics equivalent to polyester suture.

### Reference

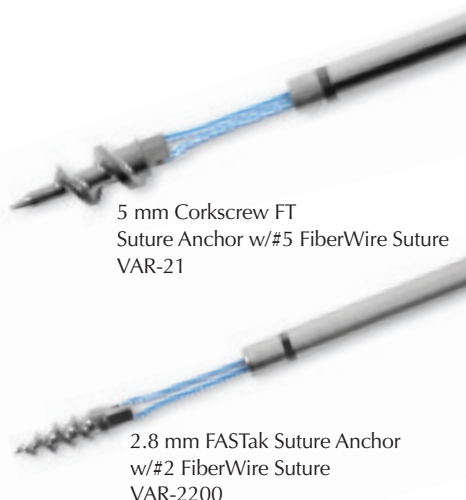
1. Data on file
2. Lo IK, Ochoa E Jr, Burkhart SS. A comparison of knot security and loop security in arthroscopic knots tied with newer high-strength suture materials. *Arthroscopy*. 2010;26(9 Suppl):S120-126. doi:10.1016/j.arthro.2009.12.009.
3. Arthrex Research and Development. LA0235. 2001.

# Recommended Postoperative Management

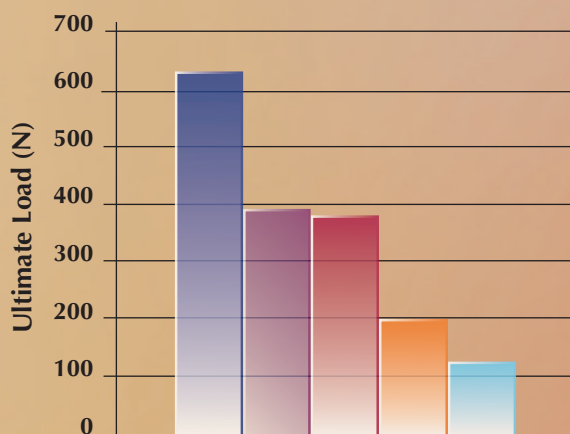
- Cefazolin: 22 mg/kg IV 30 minutes prior to incision, 90 minutes later, then every 6 hours
- Cephalexin: 22-30 mg/kg orally every 8-12 hours for 10 days post-op
- Bandaging at your discretion (soft-padded bandage for at least 24 hours is typical)
- Restrict to kennel rest when unobserved and controlled muscle building activities (ie, leash walking) for 8 weeks post-op
- Professional rehabilitation is encouraged

## Suture Anchors with FiberWire® Suture

Corkscrew® FT and FASTak™ suture anchors were designed to provide the highest strength possible in all types of indications and to make technically demanding procedures simpler, safer and reproducible. Built-in, easy-to-use features, such as laser lines on the driver shaft ensuring the anchor has been placed at an appropriate depth and the eyelet is lined up in the correct position to pass the suture in the right direction, are just a few examples. Combined with the high-strength characteristics and increased abrasion resistance of the FiberWire suture, it gives the surgeon confidence during crucial knot-tying stages where suture breakage is virtually eliminated.

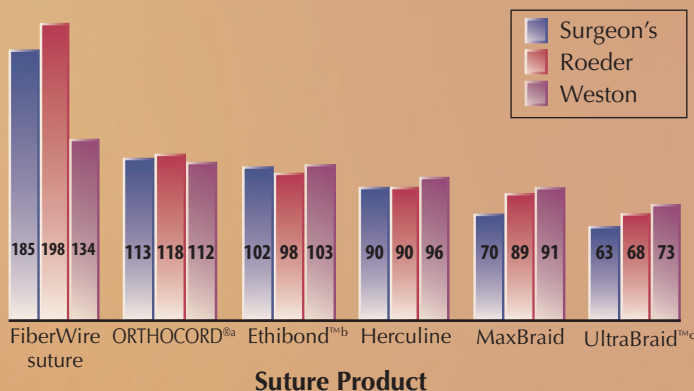


Anchor Pull-out Data<sup>1</sup>



- 5 mm Corkscrew FT suture anchor w/#5 FiberWire suture
- Securos 3.5 mm w/#5 OrthoFiber (3.2 mm drill)
- 2.8 mm FASTak suture anchor w/#2 FiberWire suture
- Imex 4 mm x 10 mm w/#2 FiberWire suture (2.7 mm drill)
- #5 BoneBiter w/#5 FiberWire suture (2.5 mm drill)

Knot Security  
Average Force (N) Causing 3 mm  
Loop Displacement - #2 Suture<sup>2</sup>



<sup>a</sup> ORTHOCORD is a registered trademark of DePuy Synthes.

<sup>b</sup> Ethibond is a trademark of Johnson & Johnson Corporation.

<sup>c</sup> UltraBraid is a trademark of Smith & Nephew, Inc.



## Surgical Technique

*Developed in conjunction with Brian S. Beale, DVM, Diplomate ACVS, Gulf Coast Veterinary Surgery; and Don A. Hulse, DVM, Diplomate ACVS, Texas A&M University*

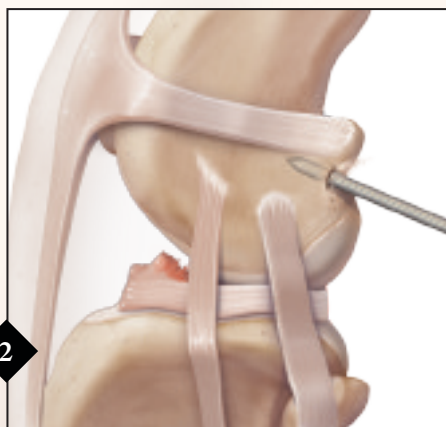
The patient is positioned in lateral or dorsal recumbency under general anesthesia. A hanging limb technique with aseptic preparation and appropriate draping should be performed. The use of a stockinette or adherent impervious drape is recommended to keep the suture from coming in contact with the skin.

A lateral parapatellar approach with arthrotomy is performed and thorough exploration of the internal structures of the joint is completed. Pathologic ligament and meniscus should be treated appropriately. Using standard technique, lavage the joint and close the joint capsule incision.

1

This illustrated stifle joint shows the recommended isometric sites for suture anchorage in the femur and tibia. In the femur, the isometric position is located caudally below the level of the distal pole of the fabella (F2). In the tibia, the isometric site is located 1 mm-3 mm caudal to the bony protuberance, which forms the caudal wall of the sulcus for the long digital extensor tendon (T3).

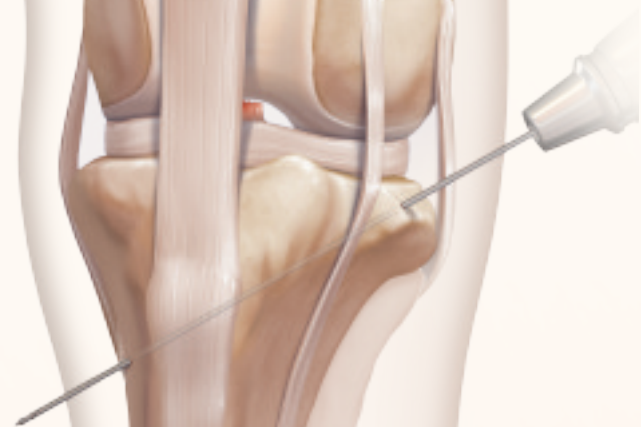
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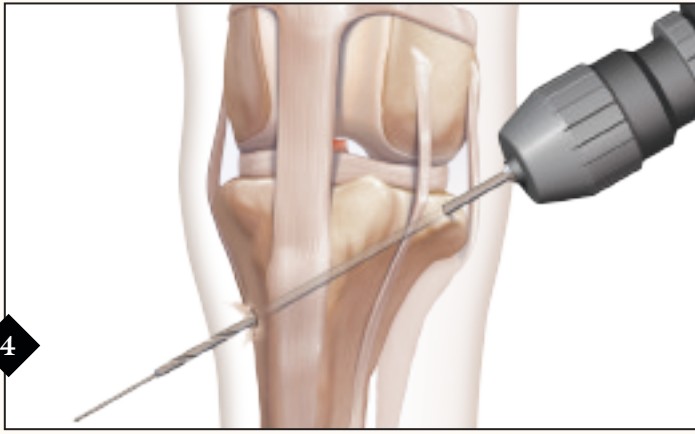


Locate the F2 site by palpating the distal pole of the lateral fabella and make a small incision to expose the caudolateral surface of the femoral condyle. Predrill a pilot hole, with a noncannulated 2 mm drill bit, in a cranioproximal direction towards the trochlea about 15 mm deep.

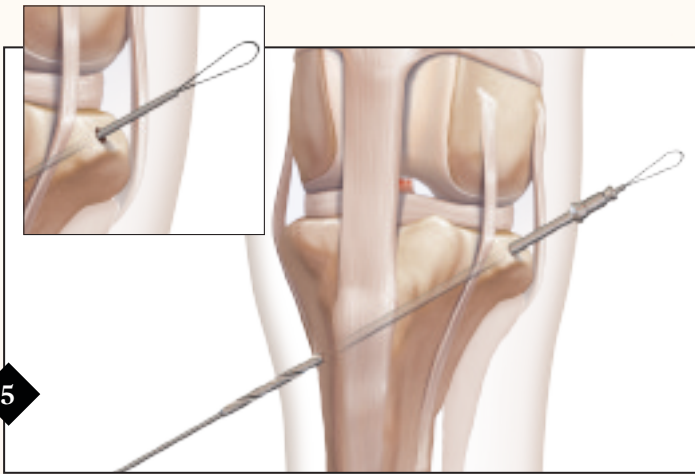
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Locate the T3 site by palpating the bony protuberance, which forms the caudal wall of the sulcus for the long digital extensor tendon. The T3 site is located at the peak of the LDE groove just caudal to the LDE. Drill a tunnel with a 0.045" Guide Wire, which will pass beneath the sulcus and exit the caudomedial cortex of the proximal tibia.

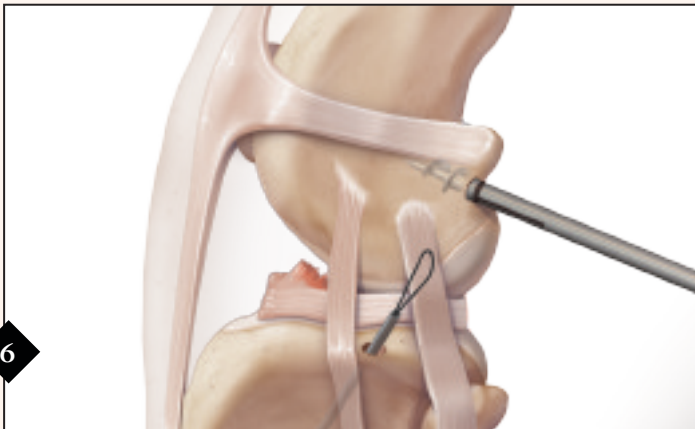




4 Place a 2 mm Cannulated Drill Bit over the Guide Wire and drill through the bone. Leave the Cannulated Drill Bit in place and remove the drill from the drill bit. Remove the Guide Wire and leave the Cannulated Drill Bit in place.



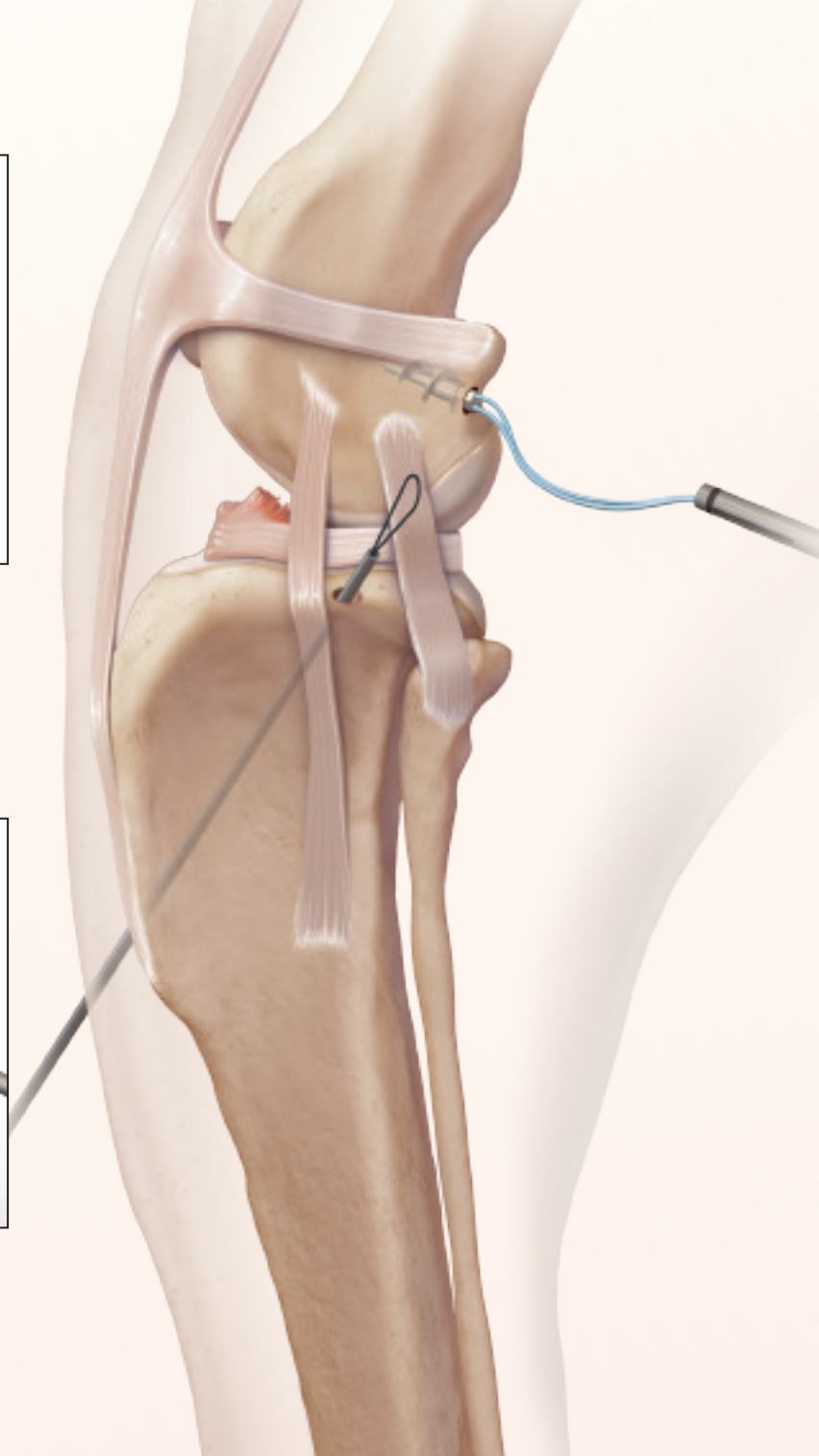
5 Advance the Nitinol Suture Passing Wire into the cannulation of the drill bit, blunt tip first, until the looped end is just exiting the top of the drill bit on the lateral side (inset). Remove the drill bit, but leave the passing wire in place. Secure the Nitinol Suture Passing Wire to keep it from slipping out of the tunnel.

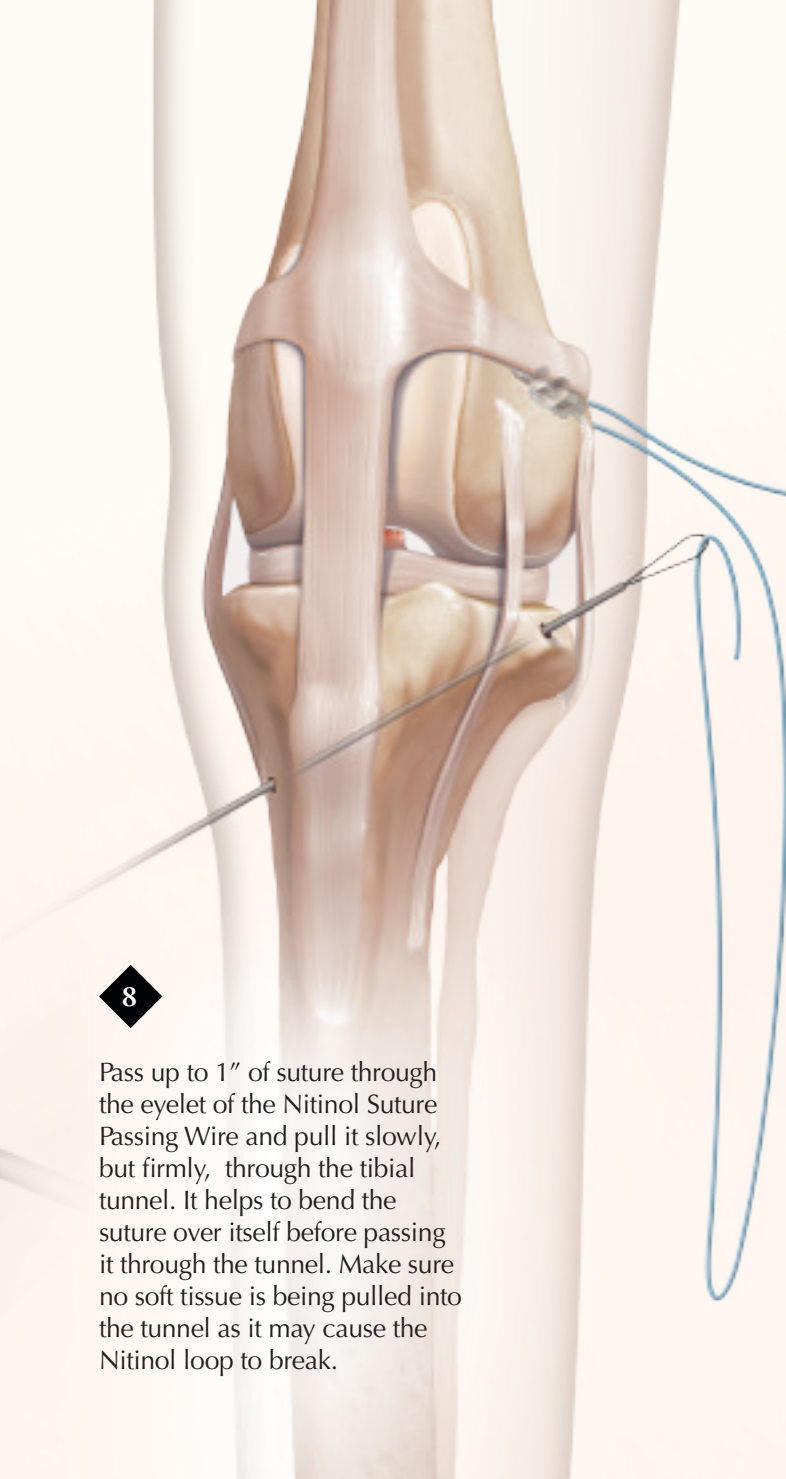


6 Insert the anchor in a cranioproximal direction towards the trochlea. Advance the anchor until the circumferential laser line is flush with the surrounding bone and the straight laser lines are pointing towards the tibial anchorage site.

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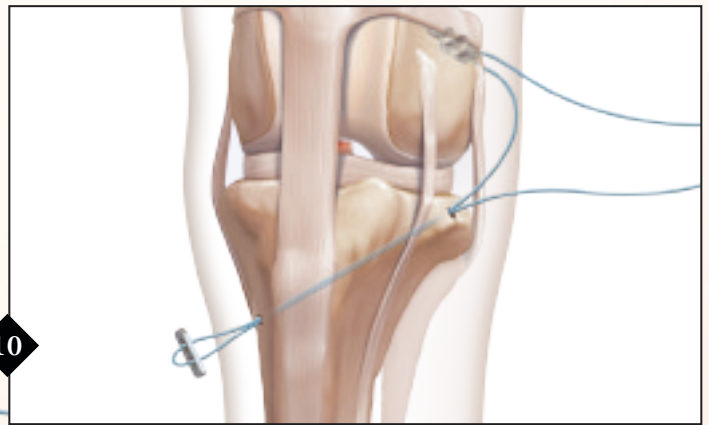
Unwrap the suture from the handle and remove the driver from the anchor by pulling back on the handle. The anchor is seated firmly, so you may need to use some force to remove the anchor driver.





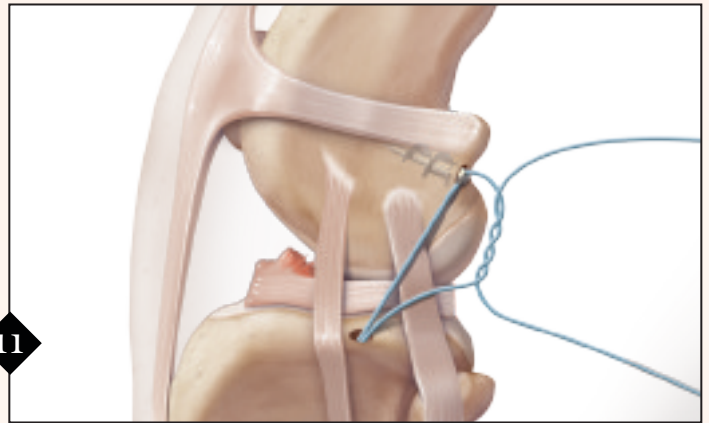
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Pass up to 1" of suture through the eyelet of the Nitinol Suture Passing Wire and pull it slowly, but firmly, through the tibial tunnel. It helps to bend the suture over itself before passing it through the tunnel. Make sure no soft tissue is being pulled into the tunnel as it may cause the Nitinol loop to break.



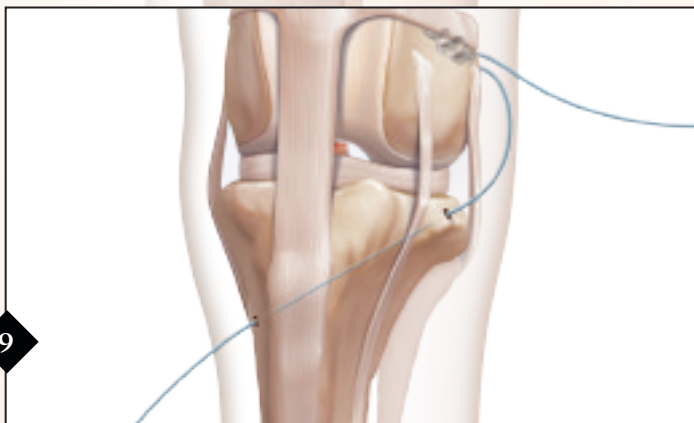
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Load the button onto the suture by placing the tip of one of the sutures up one hole and down the other. Place the Nitinol Suture Passing Wire back into the tibial tunnel with the looped end on the medial side and pass up to 1" of suture through the eyelet. Pull the suture slowly, but firmly, through the tunnel.



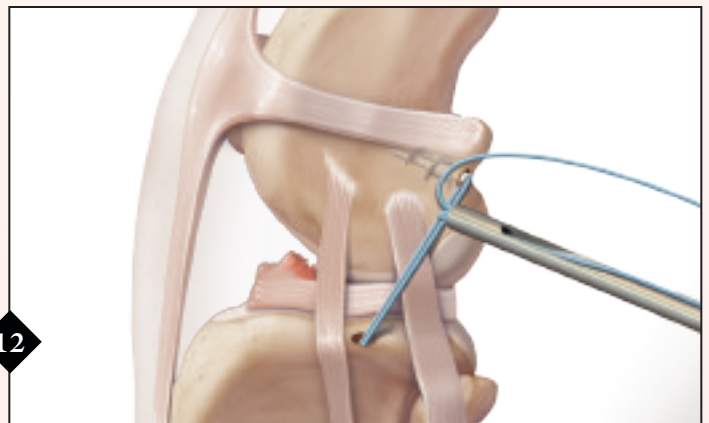
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Stabilize the joint by pulling the suture limbs to the desired tension and tie a surgeon's knot. You can clamp the knot to check for joint stability before backing the knot up with half-hitches. When the joint is stabilized, remove the clamp and tie 4-6 additional half-hitches. Cut the excess suture.



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Once the suture has exited on the medial side, pull all excess suture through the tunnel to allow for easier Suture Button loading and placement.

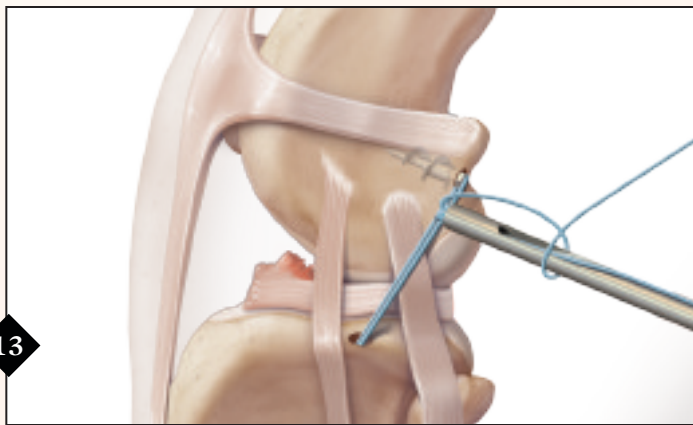


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If using the Suture Tensioner, start the double loops of the surgeon's knot and advance one limb of suture through the eyelet of the tensioner. Tension to the desired level.



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Slide a half-hitch down the shaft of the Suture Tensioner to engage the knot under tension. Remove the tensioner and apply 4-6 additional half-hitches to the knot. Cut the excess suture.

## Postoperative Rehabilitation of the CCL Deficient Stifle Joint

1. Rehabilitation begins with early pain management using modalities such as cryotherapy, massage therapy and cold laser therapy.
2. Supervised restricted activity is paramount for optimal outcome. Restricted activity is continued for 8 weeks following surgery or until released for free activity by the attending veterinarian.
3. When outside, your pet must have activity limited to that on a leash. Begin with 4-6 short (5-10 minutes) walks the first postoperative week. Walk at a pace that encourages weight-bearing with the operated leg. Initially, the pace will be very slow but as your pet becomes more comfortable, the pace and distance will increase.
4. The second week following surgery, make use of a physioball or balance board. Applying either or both modalities for 10 minutes, twice daily, is an excellent activity for strength and balance training.
5. Beginning 3 weeks after surgery, start walking through grass. This maneuver increases flexion and extension of the stifle joint. Gradually increase the height of the grass until it is slightly above the level of the tarsal joint.
6. Aquatic therapy (swimming, underwater treadmill exercise) are additional modalities which help achieve an optimal outcome. Consult a rehabilitation practitioner for additional information regarding these modalities.
7. Benefits of rehab include improved owner compliance, reduced risk of reinjury during the recovery phase, and optimal return to clinical function.

Recommendations from Sandra Hudson, BS, MBA, CCRP Owner, Canine Rehabilitation and Conditioning Center, Austin, Texas

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Check again for joint stability. Imbricate the fascia over the suture and close routinely.

### ORDERING INFORMATION

Suture Tensioner with Tensiometer	VAR-1529
FiberWire® Scissor	VAR-11796
5 mm Corkscrew® Suture Anchor w/#5 FiberWire® Suture, 25-55 lbs.	VAR-2100
2.8 mm FASTak™ Suture Anchor w/#2 FiberWire Suture, 5-25 lbs.	VAR-2200
2.8 mm FASTak Suture Anchor	VAR-2201
Suture Passing Wire, Nitinol	VAR-1255-08
Suture Button, 3.5 mm x 11 mm	VAR-8920
Cannulated Drill Bit, 2 mm	VAR-8933-20C
Guide Wire (K-wire), 0.045"	VAR-8933K



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U.S. PATENT NOS. 6,117,162; 6,214,031; 6,511,499; 6,716,234; 6,916,333 and PATENT PENDING

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