



The Iso-toggle Technique

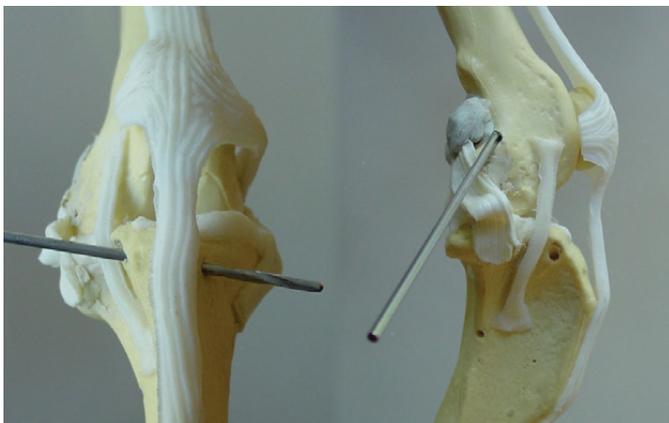
for Extra-articular Stabilisation of the Cruciate Deficient Stifle using LigaFiba

Stabilization of the canine stifle using extraarticular sutures is a well established technique. Various suture materials and methods of securing the material have been used.

Recently interest in defining ISOMETRIC points around the stifle has been generated by separate research by Don Hulse (2001) and Simon Rowe (2008).

Hulse established that there was minimal change in distance between two points defined as: close to the distal pole of the lateral fabella and the caudal border of the extensor fossa on the lateral aspect of the proximal tibia.

Rowe found that the femoral point was critical and was defined as: the very caudal edge of the lateral femoral condyle adjacent to the distal border pole of the lateral fabella. The tibial point was less critical as long as it was placed proximally. These findings were incorporated in an extra-articular technique developed by James Cook, when a braided woven polyethylene/polyester tape was placed through bone tunnels and secured on the medial aspect of the femur and tibia (TightRope© technique).



The iso-toggle technique was developed utilizing the principles of isometric suture placement and using a loop of a new braided spun ultra high molecular weight polyethylene suture called LigaFiba, secured over a nylon toggle and a tie-down button. LigaFiba is very strong (2.5x the strength of equivalent nylon), has very good abrasion characteristics and is flexible.

Materials: LigaFiba is supplied sterile in three sizes (150, 250 and 500lb), individually double wrapped in a see-through packet. In each pack there is a straight threading needle with a nylon loop, plus a nylon toggle and a nylon tie-down button. The only additional special items of equipment needed are antiskid drills bits (2.0, 2.5 and 3.5mm) and appropriate drill guides.

Size guide:

- 150lb (0.6mm) Dogs up to 15kg
- 250 lb (1.0mm) Dogs up to 30kg
- 500lb (1.6mm) Dogs over 30kg

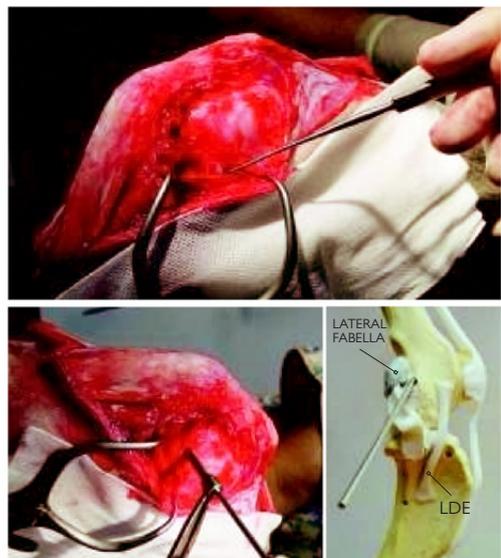
Step-by-Step Technique:

The patient is prepared for surgery and placed in dorsal recumbency. Patient preparation and draping should allow adequate aseptic exposure of the affected stifle and freedom to permit manipulation of the joint. It is advisable to work with an assistant surgeon so they can help with retraction, stabilization of the joint while drilling the bone tunnels and passing the prosthesis.



A standard lateral parapatellar approach is made with slight extension of the skin incision proximally and distally. The skin is then reflected laterally and medially to give better access to both sides of the joint. The lateral fascia is incised along the same line as the skin incision. The fascia is elevated from its insertion on the tibial crest to allow lateral reflection of the fascia and greater exposure of the structures in this area.

The joint is then opened and inspected via a lateral parapatellar incision. The ruptured ends of the cranial cruciate are debrided and the lateral and medial menisci inspected. Damaged portions of meniscus, usually the caudal horn of the medial meniscus, are resected. It is the surgeon's choice whether to perform a caudal release of the medial meniscus. After lavage of the joint with sterile saline the incision in the joint capsule is closed with interrupted sutures of a monofilament absorbable material.



The lateral fabella is identified, sitting on the caudal aspect of the femoral condyle. The femoral isometric point is identified on the caudal edge of the femoral condyle adjacent to the distal pole of the lateral fabella. The appropriate sized antiskid drill is then used to drill the femoral tunnel:

- 150lb LigaFiba 2mm drill (H090102A)
- 250lb LigaFiba 2.5mm drill (H090112A)
- 500lb LigaFiba 3.5mm drill (H090106SAS)

The initial direction of the drill hole is at right angles to the bone to reduce the chances of the drill bit slipping off the back edge of the femoral condyle. The use of a drill guide and the anti-skid drill bit goes a long way to preventing this occurrence. Once the drill bit has entered the bone the drill can then be re-directed to create a bone tunnel that is directed from a caudo-lateral position to emerge more proximally on the medial side of the femur just under the caudal edge of the medial gluteal muscle belly. Use of cannulated drill bits which are driven over a pre-inserted guide wire will eliminate drilling errors. Drilling is not started until the guide wire is in the correct position.

- 150lb LigaFiba 2.0mm cannulated drill (H090102CAN)
- 250lb LigaFiba 2.5mm cannulated drill (H090112CAN)
- 500lb LigaFiba 3.5mm cannulated drill (H090106CAN)

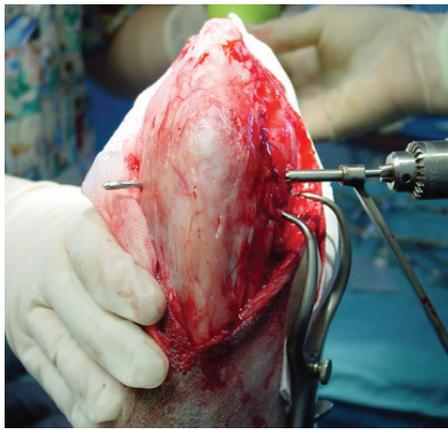




The tunnel is then flushed with sterile saline and edges of the holes should be rounded off using a countersink.

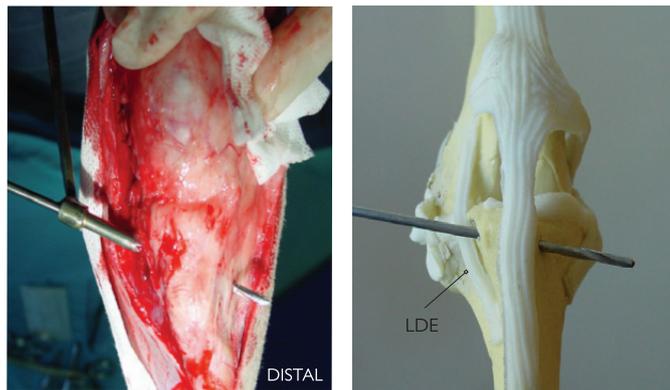
The soft tissues on the medial side of the femur around the drill hole are cleared away for a short distance to accommodate the nylon toggle.

Next the isometric point on the lateral aspect of the tibia is identified. This is achieved initially by palpation of the extensor fossa, which is defined by prominent cranial and caudal processes or tubercles. The tendon of the long digital extensor muscle runs through the fossa. There are some options here.



Hulse defines the caudal process as the optimum position. Rowe selected the cranial process and Cook placed the mark within the fossa close the cranial process.

Identification and retraction of the long digital extensor tendon is optional. An appropriate sized drill bit with drill guide, is positioned over the isometric point and a tunnel drilled across the tibia in an oblique direction to emerge on the medial aspect of the tibia close to the distal end of the medial collateral ligament.



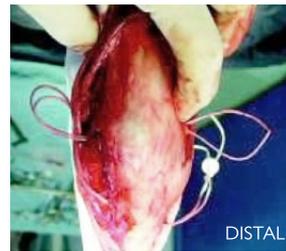
The tunnel is flushed with saline and the edges of the holes rounded off with a countersink.

The soft tissues around the drill hole on the medial side of the tibia are cleared away to allow the nylon tie-down button to sit against the bone.

The appropriate sized prosthesis is then removed from the sterile packet. Care should be taken to identify the nylon toggle which is loose, although packed against the tied down button. Setting the toggle aside, the threading needle is then used to start the process of inserting the LigaFiba prosthesis. As the objective is to secure the prosthesis against the medial aspect of the tibia the threading process starts at this point. The needle will emerge on the lateral aspect of the tibia and the prosthesis is carefully pulled through the tunnel till the tie down button, which has already been threaded on to the prosthesis, comes to gently rest against the medial aspect of the tibia.



The lateral aspect of the femoral tunnel is then located and the threading needle passed in a lateral to medial direction to emerge under the medial gluteal muscle in the space cleared tunnel and once it emerges medially the nylon loop of the passing needle is cut.



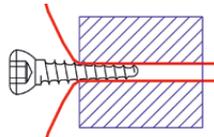
The nylon toggle is inserted into the loop of the prosthesis and while held in this position the prosthesis and the toggle are pulled firmly and carefully down against the bone on the medial aspect of the femur ensuring that there is the minimal amount of soft tissue between the toggle and the bone.





The prosthesis is then progressively tightened working back from the medial aspect of the femur to the lateral side of the stifle and then finally to the medial aspect of the tibia. The button is brought up against the medial aspect of the tibia and temporarily tightened while the joint is placed through a full range of motion and the stability checked. A slight amount of draw is to be anticipated but there should be no restriction to joint movement. Once the surgeon is satisfied with stability of the joint, the LigaFiba prosthesis is then secured over the tied down button with multiple throws and the excess material cut using the special scissors (LFS140TC). The button should be positioned against the flat surface of the medial aspect of the tibia and then the fascia can be closed over the top with interrupted sutures of an absorbable monofilament suture.

An alternative locking mechanism for the suture which avoids the medial button and knot is the interference screw which screws into the bone tunnel, over the LigaFiba, effectively jamming the suture into position.



After thorough irrigation of the soft tissues on the lateral aspect of the joint, the lateral fascia incision is closed with a continuous suture pattern of an absorbable monofilament suture. Alternatively the surgeon may choose to place a series of interrupted imbrication sutures in the fascia. The wound is then closed in a routine manner and a light dressing applied to the wound.

Postoperative care: Patients are routinely given postoperative NSAIDs and some from of narcotic analgesia. Owners are instructed to confine the patient to leash walking only for a period of 4 weeks. Sutures are removed at 10 days at this time a four week course of Cartrophen injections is started. Passive mobilization of the joint and trigger point therapy is also initiated at this stage. After about 4 weeks of confinement more active use of the leg is encouraged by way of increased walking, sit-walk exercises and swimming. Most patients should be expected to be weight bearing at 3 weeks and making more use of the leg with time.

Special thanks to Geoff Robins for the preparation of this guide

LigaFiba IsoToggle Products

LIGAFIBA ISOTOGGLE SUTURES

LFITS150	150lb Iso Toggle Suture Set
LFITS250	250lb Iso Toggle Suture Set
LFITS500	500lb Iso Toggle Suture Set
LFISOKIT	Iso Toggle Starter Kit (250 & 500lb) x 2 of each
DVDALL	Free Procedure DVD
BRLIGAISO	Step by Step Guide to LigaFiba® Iso Toggle Suture

ISOTOGGLE CONSUMABLES

H090102AS	2.0mm Antiskid Drill (150lb) 100mm
H090112AS	2.5mm Antiskid Drill (250lb) 115mm
H090106SAS/L	3.5mm Antiskid Drill (500lb) 180mm
090166/E	Ormrod Button 6mm Diameter Sterile 2 Holes (150lb)
090166/F	Ormrod Button 6mm Diameter Sterile 2 Slots (150lb)
090166/A	Ormrod Button 9mm Diameter Sterile 2 Holes (250lb)
090166/B	Ormrod Button 9mm Diameter Sterile 2 Slots (250lb)
090166/C	Ormrod Button 11mm Diameter Sterile 2 Holes (500lb)
090166/D	Ormrod Button 11mm Diameter Sterile 2 Slots (500lb)

CANNULATED DRILLS

H090102CAN	2.0mm 130mm long 1.1mm cannulation
H090112CAN	2.5mm 130mm long 1.1mm cannulation
H090104CAN	2.7mm 130mm long 1.1mm cannulation
H090106CAN	3.5mm 130mm long 1.1mm cannulation
S090102CAN	2.0mm 130mm long 1.1mm cannulation AO Quickfit
S090112CAN	2.5mm 130mm long 1.1mm cannulation AO Quickfit
S090104CAN	2.7mm 130mm long 1.1mm cannulation AO Quickfit
S090106CAN	3.5mm 130mm long 1.1mm cannulation AO Quickfit
90021	Guide Wire 1.1mm x 125mm (pack of 10)

LIGAFIBA ISO TOGGLE INTERFERENCE LOCKING SCREWS

LFIS253518SS	Interference screw 3.5 Stainless 18mm
LFIS253518TI	Interference screw 3.5 Titanium 18mm
LFIS354523SS	Interference screw 4.5 Stainless 23mm
LFIS354523TI	Interference screw 4.5 Titanium 23mm

Other LigaFiba Products

LIGAFIBA

LF150500	150lb LigaFiba x 500mm
LF250600	250lb LigaFiba x 600mm
LF500600	500lb LigaFiba x 600mm
LFTRS150	150lb LigaFiba Tendon Repair Suture
LFS140TC	LigaFiba Scissors

LIGAFIBA LATERAL SUTURES

LFLS150	150lb LigaFiba Lateral Suture (500mm)
LFLS250	250lb LigaFiba Lateral Suture (500mm)
LFLS500	500lb LigaFiba Lateral Suture (600mm)

LIGAFIBA CRIMPS

LFCRIMP150	Crimp for 150lb LigaFiba
LFCRIMP250	Crimp for 250lb LigaFiba
LFCRIMP500	Crimp for 500lb LigaFiba

