STABILITY VERSATILITY RECOVERY

GASTROCNEMIUS TENDON REPAIR USING THE NOVATEN IMPLANT

VETLIG

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ARTIFICIAL LIGAMENTS FOR VETERINARY USE



CONTINUITY OF THE BRAIDED FIBRE The braided fibres run the whole length of the tendon thus giving strength and resistance to

whole implant.

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GASTROCNEMIUS/ACHILLES TENDON REPAIR

MEDICAL **GRADE FIBRE**

Allowing perfect biocompatibility, strength and resistance.

HIGH POROSITY Enhancing fibroblastic in-growth.

VETLIG LTD offers a full range of synthetic ligaments and tendons. Designed specifically for veterinary use, our products are minimally invasive and mimic the original native ligament or tendon we are replacing or reinforcing. Vetlig products aim to regain quicker post operative mobility and quality of life compared to conventional repairs.

We only use human medical grade UHMWPE Fibre that comes from CE and FDA approved human manufacturing facilities in Europe.

For the Achilles Tendon Reconstruction, we provide two sizes of tendon. Each has an approximate resistance in Newtons :

•NOVATEN® 2000 : 2000 N 2.5mm tunnel 3mm screw for cats and small dogs under 10 KG

•NOVATEN® 4000 : 4380 N 3mm tunnel 4 and 4mm screws

Under 10=35 KG

•NOVATEN® 8000 : 8200 N 3.6mm tunnel and 4.5 to 6mm screws Over 20 KG



THE CHOICE OF THE TENDON DEPENDS ON ANIMAL'S WEIGHT AND ACTIVITY

The selection criteria for the size of the tendon graft to be implanted is in relation to the weight of the animal, the level of activity and to be compatible with the bone size.

No need for an external fixator or a calcaneotibial screw post op.

As an indication:

NOVATEN[®] 2000 fits into a 2.5mm tunnel NOVATEN[®] 4000 fits into a 3.0mm tunnel NOVATEN[®] 8000 fits into a 3.6mm tunnel

MANAGEMENT OF GASTROCNEMIUS TENDON DISRUPTION IN CANINE PATIENTS USING A SYNTHETIC TENDON

Introduction

Chronic degeneration and scar tissue formation at the calcaneal insertion of the gastrocnemius tendon is a common cause of disruption to the calcaneal tendon mechanism.

In order to restore a functional length, scar tissue must be excised and the gastrocnemius reattached to the calcaneus.



PATIENT POSITIONING

The patient is positioned in sternal recumbency with the affected limb extended behind the patient. It is important to ensure the margin of the clip extends circumferentially, to the level of the proximal femur allowing adequate access for the implant to be sutured in place.



SURGICAL TECHNIQUE

The surgical technique is demonstrated in a normal cadaver, allowing clear identification of anatomical features.

STEP 1

•A caudo-lateral incision is made extending distally from the gastrocnemius muscle to the mid body of the calcaneus. Obvious scar tissue will be easily identifiable proximal to the calcaneus. (In the clinical case shown opposite, the thickened insertion of the common calcaneal tendon is visible at the base of the image.)



STEP 2

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•The paratenon is incised; it is often difficult to differentiate between the insertions of the gastrocnemius and combined tendon of the gracilis, biceps femoris and semitendinosus.

The lateral retinaculum of the superficial digital flexor tendon is incised along the lateral margin of the calcaneus and luxated medially. In this cadaver image, a defect has been created in the distal gastrocnemius tendon.

•In the majority of cases, the degenerate insertion of the gastrocnemius will be detached from the tuber calcanei.

All abnormal scar tissue is excised to the level of normal tendon tissue proximally. The bridging function of the Novaten implant allows all abnormal tissue to be excised, even if this makes it impossible to appose the gastrocnemius and the calcaneus.

•The Novaten is placed over the common calcaneal tendon mechanism to estimate optimal positioning.

•The implant is positioned between the medial and lateral portions of the gastrocnemius and the myotendinous junction, sandwiched over the proximal portion as shown above.

In larger patients it is possible to pull the implant through the middle of the tendon from proximal to distal. (It is important to remember that the implant and gastrocnemius will be pulled distally to the calcaneus to restore functional length, so the implant should be secured proximal enough to allow this) Suture the Novaten® with single sutures spaced 5 mm apart to sandwich it inside the Achilles tendon. The latest study shows the use of UHMWPE Fiber tech is considered superior for tear resistance with overlocking suture made with UHMPE 5 metric, 5mm spaced and at least 8 passes. B. Goin et al (2020 Biomech-anical comparison of two suturing techniques during Achilles tendinoplasty in dogs).

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A Kessler suture or a three loop pulley suture can be made to bridge the join between both ends of the tendon when the gap between the two ends is possible. Once the suture is done, protect the ligament with a compress soaked in saline to limit the risks of contamination.

Please note the picture shown below is an acute tendon that has been split to allow suturing of the implant. With the chronic cases you will use simple interrupted sutures but not split the tendon, it is unusual to be able to split the tendon in chronic cases so suture onto the myotendinous junction of the gastrocnemius, extending distally onto the gastrocnemius tendon.

STEP 5 Tunnel 1

The first bone tunnel is made from the middle of the proximal surface of the calcaneus towards its plantar aspect. Drill with a 2mm K wire and then over drill with the cannulated drill depending on which size implant is chosen. (4000 is a 3mm tunnel and 8000 is a 3.6mm tunnel).

Tunnel 2

The second tunnel is made perpendicular to the first one (a few millimetres distally to the exit of the first hole) using the same process (K-wire and Cannulated drill bit). Drill from the lateral aspect to the medial side of the calcaneus. This second tunnel is possible only if the calcaneum is large enough to support it. To avoid any risk of fracture, drill in the middle of the surface to conserve enough bone on each side.

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You must pre-tap the tunnel with the screw you are going to use, this is because the bone is so hard it makes it easier if you do this prior to passing the ligament. Use the 1mm k wire and screwdriver to do a few turns of the screw.

Please see flow chart at the back for tunnel and screw dimensions.

The synthetic tendon is passed through the first tunnel and the second perpendicular tunnel. For the graft placement: insert the passing tube in the first tunnel and place the bendy wire through the tube exiting proximally. Put the Novaten ends into the bendy wire and pull through.Use the same technique for the second perpendicular tunnel so that the wire exits medially on the calcaneus.

Use a curved Kocher forceps to pull the tendon between the two tunnels. When the correct position is found, you can quickly lock the forceps on the medial side of the calcaneus to prevent the slipping of the implant back through the tunnel while you select the screw.

Tension in the common calcaneal tendon mechanism is checked. It should not be possible to flex the hock with stifle in extension. If flexion of the hock is still possible with the stifle extended, it is possible to reposition the proximal section by removing the sutures and repositioning more proximally. (Flexion of the stifle makes this adjustment easier.)

Additional appositional sutures can be placed between the calcaneus and the end of the gastrocnemius if needed. The superficial digital flexor tendon is reduced and the retinaculum, along with the paratenon is closed over the repair. The remaining soft tissues are then closed routinely.

Measure the depth of the perpendicular tunnel in the calcaneum and choose a screw that will be bi-cortical for a better fixation for the implant.

Insert the screw using a 1 mm K-wire to beyond the cortex. Use the cannulated screwdriver over the 1mm guide wire to insert the screw.

POST-OPERATIVE CARE

The use of a NOVATEN avoids having to use an external fixator or tibio-calcaneal screw.

Immobilisation for 6 weeks is recommended, using a cast, bi-valve cast or splint.

A further 6 weeks of restricted activity is advised before beginning short lead walks.

These should be increased gradually over a further 6 weeks.

Physiotherapy and hydrotherapy are encouraged following dressing removal.

Improved Resistance - Improved Biocompatibility increased surface area for suturing - Less Invasive -Easier fixation by interference screw

INSTRUMENTATION

A complete instrumentation set is available for ligament reconstruction using NOVATEN® or NOVALIG®.

SUTURE - FIBER TECH

We recommend the use of FIBER TECH to suture the implant to the tendon. It will enable a stronger and immediate biomechanical fixation of the implants. B. Goin, P. Buttin, T. Cachon & E. Viguier (2020) Biomechanical comparison of two

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5 mm

suturing techniques during Achilles tendinoplasty in dogs: preliminary results, Computer Methods in Biomechanics and Biomedical Engineering, 23:sup1, S128-S129, DOI: 10.1080/10255842. 2020.1816299.

NB : Make sure the screw diameter remains <1/3 of the bone diameter & choose the screw that will fill entirely (when possible) the tunnel length

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7 mm screw

Achilles publications on the Novaten tendon.

- P. Buttin, B. Goin, N. Giraud, E. Viguier & T. Cachon (2020) Biomechanical analysis of an original repair of an achilles tendon rupture in dogs: preliminary results, Computer Methods in Biomechanics and Biomedical Engineering, 23:sup1, S52-S54, DOI: 10.1080/10255842.2020.1812157
- B. Goin, P. Buttin, T. Cachon & E. Viguier (2020) Biomechanical comparison of two suturing techniques during Achilles tendinoplasty in dogs: preliminary results, Computer Methods in Biomechanics and Biomedical Engineering, 23:sup1, S128-S129, DOI: 10.1080/10255842.2020.1816299
- P.Buttin, (2020) et al Repair of tendon disruption using a novel synthetic fiber implant in dogs and cats, the surgical proceedure and three case reports. Veterinary medicine international, Vol 2020, ID 4146790.

On the previous CAT 30 by Lars ligaments we sold, now discontinued.

- M.Morton et al, (2015) Mechanical testing of a synthetic canine gastrocnemius tendon implant. Veterinary surgery 2015
- M.Morton et al, (2015) repair of chronic rupture of the insertion of the gastrocnemius tendon in the dog using a terephthalate implant, Vet comp traumatology 2015 (VCOT)

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