



Spring!

HELLO FOURLEG MEMBERS!

Kudos to you for continuing your canine rehab – technical and business learning! You are among the elite that are learning, growing, and making a big difference in this field! I honour you for joining me each week (or when you get to it)!

I am excited to share with you, this newsletter instalment of cruciate deficiency, repair approaches and rehab. This time we look at the Tighrope procedure and the bone anchor technique. As always, I give you my perspective on the relevance to rehab for each. I hope you enjoy and find the articles enlightening.

I hope to see many of you at the STAAR Conference in New Jersey (www.staarconference.com), or perhaps on one of my teaching ‘adventures’ in May – in Germany, Switzerland, or Sweden! Fun! Ha! While I’m telling you about my upcoming teaching... I should also throw out there, to please feel free to contact me if you might be interested in hosting a course with me by your group / organization.

Okay... so onwards with the learning!
Cheers, Laurie

Detection of Meniscal Tears

Apparently, cadaveric studies have shown arthroscopy to be more sensitive than arthrotomy in detecting meniscal tears. This study compared detection rates in clinical cases. The authors hypothesizing that arthroscopy would detect more meniscal injuries than arthrotomy.

Methodology

This was a retrospective cohort study on 531 stifles (430 dogs) with naturally occurring cranial cruciate ligament ruptures. Intra articular structures were examined by either arthroscopy or medial parapatellar arthrotomy.

What did they find?

Arthroscopic procedures were performed in 58.8% of cases and arthrotomy in 41.2%. Of stifles examine, 44% were found to have meniscal tears. Of those examined by arthrotomy, 38.8% had meniscal tears compared to 48.4% of those examined arthroscopically.

Results were analyzed, and there was a significant difference found between the two groups. Meniscal tears were found more frequently by arthroscopy than arthrotomy. The results suggest that arthroscopy may miss fewer meniscal tears than arthrotomy.

Relevance to Rehab

Well, this is rather interesting, because we know that a certain percentage of post-operative cruciate reconstructive cases go on to develop meniscal tears. Perhaps a few of those are ‘missed’ meniscal tears from the time of surgery. So clinically, if you have a case that seems to look like a meniscal tear (tippy-toe walking, failure to make timely significant improvements in use and muscle girth, then perhaps this study needs to be in the back of your mind. And... If you suspect a meniscal tear, try conservative management first (modalities and manual therapy – distraction mobilization), but be prepared to refer back for a second surgical consult.

Plesman RL, Gilbert PJ, Campbell J. Comparison of the detection of meniscal tears by arthroscopy and arthrotomy in dogs with cranial cruciate ligament ruptures: a retrospective, cohort study. Proceeding of the European College of Veterinary Surgeons Annual Scientific Meeting. July 4–6, 2013. Rome, Italy

FOUR LEG REHAB INC

PO Box 1581,
Cochrane, AB T4C 1B5
Canada
Laurie@Fourleg.com

The Tightrope Procedure

This paper describes the development and testing of the TightRope (TR) technique for stabilization of cranial cruciate ligament (CCL) deficient stifles. They compared their outcome against the tibial plateau levelling osteotomy (TPLO) technique. The stimulus for the development of this technique was to find a low morbidity, low complication rate, and cost effective option for repair of CCL deficient stifles.

Method:

The study was a prospective clinical cohort study on medium to giant breed dogs. Prior to clinical implementation the procedure was developed and tested on cadavers. 47 dogs were enrolled in the study, 24 undergoing the TR, & 23 the TPLO. Inclusion criteria included unilateral hindlimb lameness caused by CCL deficiency (based on palpation, effusion, pain, abnormal cranial drawer, tibial thrust, and radiographic findings). Dogs with additional orthopedic or neurologic disorders and those weighing less than 15kg were excluded.

Joint pathology between treatment groups was equivalent (meniscal tears and CCL disruptions). All CCL's were completely debrided and all meniscal tears treated. Post-operative care was standardized and comprised immediate post-surgery radiographs, 2-5 day hospitalization for post-surgical and bandage care, NSAIDs for 10 days, and Tramadol for 3 days. Staple removal was at 10-14 days. Exercise was restricted to 5 minute leash walks for urination/defecation.

Rechecks were performed at 8 weeks and 6 months post-surgery comprising sedated radiographs and measurement of drawer and tibial thrust by one examiner. Radiographs were assessed for healing, implant status and degree of osteoarthritis. Function was assessed at 6-months by owners using the Texas A&M client questionnaire.

Results:

Anesthesia and surgery time for the TR procedure was significantly less than for TPLO. Major and minor complication rates did not significantly differ between the two groups. Complications with the TR technique included implant failure, infection, meniscal tear and seroma. For TPLO, there were fracture/failure, infection, patellar tendonitis, incision problems, and marked seroma reported. There was no statistically significant difference between the two groups on assessment of drawer and cranial tibial thrust pre-operatively, but cranial drawer was significantly lower in TR stifles on assessment at all follow-ups. No significant differences between procedures were found on either radiographic OA scoring or on the Texas A&M client questionnaire.

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Meniscal Injury and Lameness

Evidence for surgical treatment of meniscal injury in dogs is lacking and there have been questions as to the need for meniscal surgery. This study investigated lameness in dogs with cranial cruciate ligament (CCL) ruptures to see if those with concurrent meniscal injuries are more lame than those without.

Method:

Medical records of dogs presenting for suspected CCL rupture were reviewed. Meniscal injury was defined as injury to the medial meniscus that was surgically addressed at the time of stifle surgery. Kinetic gait analysis (PVF, VI, FS and PVF AI) was performed using a force platform with dogs analyzed within 24 hours pre-operatively at a walking gait.

Results:

18 dogs fulfilled inclusion criteria. Nine had a meniscal injury, nine did not. Mean duration of clinical signs (prior to presentation for surgery) was 21 days in the group with meniscal injury and 180 days in dogs with no meniscal injury.

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PO Box 1581,
Cochrane, AB T4C 1B5
Canada
Laurie@Fourleg.com

...The Tigtrope Procedure continued

A second, post clinical release study of 1004 TR cases from 29 centers looked at longer term outcomes (3 months to 3 years) for the TR technique. Outcomes were seen as successful (subjective scoring by a DVM) in 93.9% of cases. Full function (restoration of full duration/performance to pre injury status) was achieved in 54.1% of reported cases with, 39.8% acceptable (limited restoration/performance and/or require medication to achieve full function), and 6.1% unacceptable (all other outcomes).

Complication data from this second study found no catastrophic complications (resulting in death or euthanasia), 9.9% major (required further treatment based on current standards of care) and 10.1% minor (not requiring additional medical or surgical intervention to resolve). Major complications included meniscal tears, infection and failure, with minor complications comprising seroma formation.

Discussion/Conclusions:

The findings for TR and TPLO at 6 months suggest similar mid-term functional outcome, although the TR procedure may have advantages with respects to stifle stability and joint kinematics during the formation of periarticular fibrosis. Complication rates for the TR technique are, according to the author, the lowest in reported peer reviewed literature. The author describing the technique as a safe, effective and viable option for CCL deficiency in dogs. It should be noted however that that initial study was not randomized, the treatment group assigned being based on discussion between surgeon and client. Additionally outcome scoring by clients was subjective and only conducted at 6 months post-surgery.

Relevance to Rehab

With the tigtrope technique being the newest of the CCL-deficient treatment techniques, it is good to know the statistics on this surgical technique. I am not certain that 54.1% return to full function is a superior outcome to the TPLO or TTA... direct comparisons on those fronts would be interesting to learn. And naturally, a rehab program consisting of 5-minute leash walks for elimination is entirely insufficient. Unfortunately, at my clinic we have had directive from surgeons specific to this recommendation based on this publication. Rehab-specific studies most certainly do need to be conducted to justify and promote more appropriate post-operative rehab protocols.

Cook JL, Luther JK, Beetem J, Karnes J, Cook CR. Clinical Comparison of a Novel Extracapsular Stabilization Procedure and Tibial Plateau Leveling Osteotomy for Treatment of Cranial Cruciate Ligament Deficiency in Dogs. *Veterinary Surgery* 39 (2010) 315-323

Cook JL. Tigtrope Complications. Proceedings of the 15th ESVOT Congress September 15 - 18, 2010 Bologna, Italy.

Cook JL. Tigtrope Results. Proceedings of the 15th ESVOT Congress September 15 - 18, 2010 Bologna, Italy.

... Meniscal Injury and Lameness continued

Discussion/conclusion:

This study provides evidence that dogs with meniscal injury in addition to CCL rupture are more lame than those with CCL rupture alone. The authors additionally cite this as proof that meniscal injury is a source of the overall pain in dogs with CCL rupture and that meniscal injuries should be treated at the time of surgery.

Relevance to Rehab:

Dogs with a meniscal injury are more painful. We know in human medicine that joint pain can cause muscle inhibition and increases the risk for central and peripheral sensitization (wind-up phenomenon). So, these cases need to be appropriately addressed sooner than later, and post-operative rehab might do well to incorporate a greater degree of early post-operative pain management strategies / techniques to aid in a more expedient recovery.

Wustefeld-Janssens BG, Cowderoy EC, Comerford EJ, Pettitt RA, Innes JF. The association between meniscal injury and the degree of lameness in dogs with cranial cruciate ligament rupture. Proceeding of the European College of Veterinary Surgeons Annual Scientific Meeting. July 4-6, 2013. Rome, Italy



FOUR LEG REHAB INC

PO Box 1581,
 Cochrane, AB T4C 1B5
 Canada
Laurie@Fourleg.com

Long-term Outcomes for Dogs Undergoing TightRope, Tibial Plateau Levelling Osteotomy or Tibial Tuberosity Advancement Procedures

This study looked at long-term outcomes for dogs undergoing TightRope (TR), tibial plateau levelling osteotomy (TPLO), or tibial tuberosity advancement (TTA) procedures for cranial cruciate ligament disease.

Method:

This retrospective clinical study was based on review of medical records for the period 2006 – 2009, and responses to a subjective client questionnaire received from owners of dogs at least a year post surgery. Outcomes for the procedures were compared based on return to function, pain, and complications.

Results & Conclusion:

TTA was found to have significantly higher rates of major complications and meniscal tears than either the TPLO or TR. TPLO in turn had higher complication and meniscal tear rates than TR.

While there was no statistical difference between groups with regards to pain, TTA patients were reported as having more frequent and severe pain than TPLO or TR.

Fewer TTA cases were reported as returning to full function than either TPLO or TR. Percent of 'full function' at greater than 1-year after surgery was 93.1% + 10.0% for TPLO, 92.7% + 19.3% for TR, and 89.2% + 11.6% for TTA.

The authors concluded that long-term outcomes for both TPLO and TR were superior to TTA, with the TR having the highest safety-efficiency ratio.

Relevance to Rehab

It appears that the battle for CCL-repair supremacy rages on. Quite frankly, it likely boils down to the skill and experience of the surgeon in general and which technique he / she utilizes and practices the most.

Christopher SA, Beetem J, Cook JL. Comparison of long-term outcomes associated with three surgical techniques for treatment of cranial cruciate ligament disease in dogs. Vet Surg. 2013 Apr; 42(3):329-34

Tightrope versus Percutaneous Lateral Fabellar Suture

In these three articles the authors compare the tightrope procedure to the percutaneous lateral fabellar suture technique (pLFS). Third year veterinary students and small animal surgery residents were asked to perform both tightrope and pLFS procedures. Procedure difficulty, deviation and duration of surgery were assessed using radiographs, palpation, dissection and questionnaires. Cranial tibial translation was measured using a mechanical testing machine.

The tightrope procedure was reported as more difficult than the pLFS technique by both students and residents. More technical deviations were also seen during the training period of the Tightrope, and as such, the authors recommending practice on cadavers prior to implementing the technique in their practice.

Both procedures were similar in their ability to withstand displacement (1mm – 12mm) and eliminate cranial tibial translation. Both repair methods were significantly weaker than an intact cranial cruciate ligament.

Relevance to rehab:

Hmm... it might be good to know how long your local surgeon has been performing this technique and/or how many cadavers he or she has practiced on!

Biskup JJ, Griffon DJ, Socie M, Schaeffer DJ, Kurath P. Ability of the Tightrope® and Percutaneous Lateral Fabellar Suture Techniques to Control Cranial Tibial Translation. Vet Surg. 2014 Jan 16.

Biskup JJ, Griffon DJ. Technical Difficulties During the Training Phase for Tightrope® and Percutaneous Lateral Fabellar Suture Techniques for Cranial Cruciate Ligament Repair. Vet Surg. 2014 Jan 16.

Griffon D, Biskup J. Tightrope® versus percutaneous lateral fabellar suture: technical errors and biomechanical properties. Proceeding of the European College of Veterinary Surgeons Annual Scientific Meeting. July 4–6, 2013. Rome, Italy

FOUR LEG REHAB INC

PO Box 1581,
 Cochrane, AB T4C 1B5
 Canada
Laurie@Fourleg.com

SwiveLock Bone Anchor Stabilization

This one is a retrospective study reporting long term outcomes in dogs with cranial cruciate ligament (CCL) deficiency stabilized using SwiveLock bone anchor technique.

Method:

Medical records were reviewed for patients undergoing SwiveLock stabilization between June 2008 and January 2012. Dogs greater than 6 months out from surgery and without additional orthopedic or neurologic problems were included in the study. Data collected included signalment, extent and location of injury, meniscal status, complications, presence of cranial drawer at recheck, and time to follow up with owner.

Findings:

There were 41 dogs of a variety of breeds in the study. Dogs were divided into three groups based on weight (<15kg, 15-30kg, >30kg). All surgery was arthroscopic and involved placement of a knotless SwiveLock bone anchor preloaded with 2mm FiberTape. All stifles were evaluated and partial meniscectomy was performed on any meniscal tears found. The size of the SwiveLock was determined based on patient bodyweight and activity level. Two dogs had a second FiberTape placed. Post-operative radiographs were taken

All dogs received the same discharge instructions including short on leash activity until the 8 week recheck and professional rehabilitation beginning at week 2. Final evaluation was at 7-8 weeks post-surgery, and comprised of a physical exam and un-sedated measurement of cranial drawer.

Limb function was assessed (pre- & post-operatively) using a validated owner questionnaire comprised of 7 questions about function. (Questionnaire was given after injury but before surgery and again 6-months post-surgery.)

What did they learn?

Three cases (7.3%) experienced major complications requiring surgical correction (two infections, one subsequent meniscal tear), no minor complications were reported. The complication rate of 7.3% is consistent with other extra capsular stabilization technique.

Cranial drawer at 7-8 weeks post-surgery was 0-3mm in 36 (87.8%) cases the remaining 5 (12.2%) having 4-6mm. Comparison of owner responses to the validated questionnaire showed a statistically significant, positive change on all questions between the pre-operative and the post-operative stage.

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VIDEO VAULT

For a 1 minute animated overview of the Tightrope procedure visit:

<http://www.youtube.com/watch?v=fXb526S5rBc>

USEFUL LINKS

Thanks to Dr. Kevin Jones for finding and sharing the following university websites:

<http://cal.vet.upenn.edu/projects/saortho/contents/contents.htm>

<http://vanat.cvm.umn.edu/index.html>

<http://www.cvmbc.colostate.edu/vetneuro/index.html>

http://vetmed.illinois.edu/courses/imaging_anatomy/

Do you have any videos or links you would like to share? Any techniques that you would like to see or know more about? Drop me a line with your links and requests!



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PO Box 1581,
Cochrane, AB T4C 1B5
Canada
Laurie@Fourleg.com

... SwiveLock Bone Anchor Stabilization continued

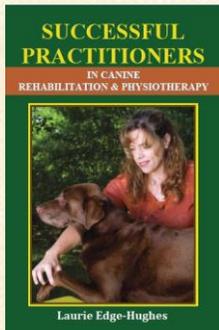
The SwiveLock system maintained stability through the eight week recheck and had good longer term function based on subjective owner assessment. The study was limited in that osteoarthritis was not tracked radiographically, drawer was not measured while the dog was sedated, and the population size was small. There were no anchor failures in the study.

The authors report that clinical assessment showed the SwiveLock system has the least elongation and peak to peak failure compared to other extra capsular repair techniques.

Relevance to Rehab:

I think this paper is just good to know in the event that you are seeing dogs that have had this technique performed.

Raske M, Hulse D. SwiveLock Bone Anchor Stabilization of the Cranial Cruciate Ligament Deficient Stifle in Dogs: Clinical Outcome. Open Journal of Veterinary Medicine, 2013, 3, 297-301



An enlightening book dedicated to telling the stories of 33 successful animal rehab / physio Practitioners. Learn from theirs successes, failures, & advice.

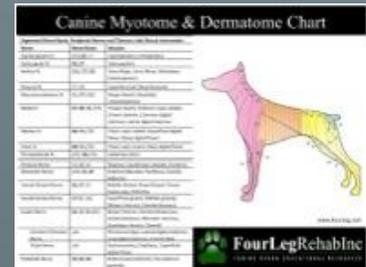


An electronic book dedicated to marketing your canine rehab practice. Often a neglected, but vital part of being successful in business is knowing how to market properly.

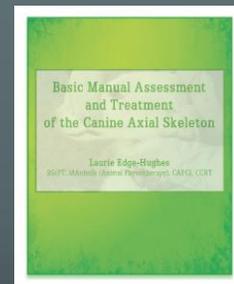
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A book dedicated to assessment & treatment of the canine spine. Giving you the essentials to treating this important (and often compromised) part of the dog.

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PO Box 1581,
Cochrane, AB T4C 1B5
Canada
Laurie@Fourleg.com