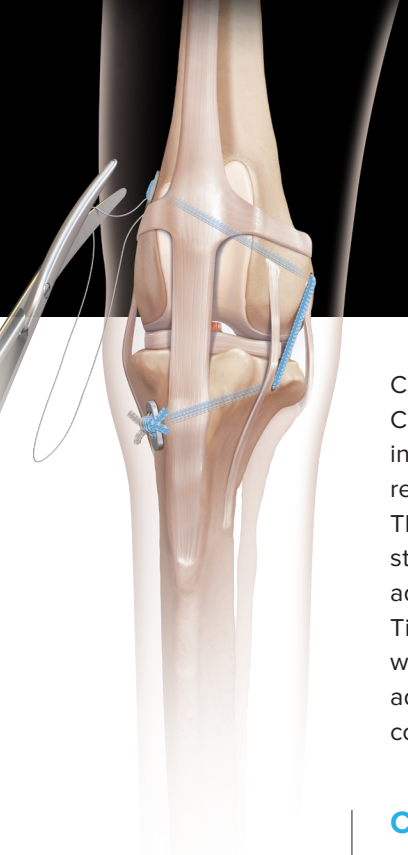

TightRope® Fixation System for Cranial Cruciate Ligament (CCL) Injury

Cranial cruciate ligament (CCL) is one of the most common orthopedic injuries in canines. Canines are particularly suspectable to this injury due to their stifle anatomy, which places increased strain on the CCL, leading to a high prevalence of tears. Intra-articular ligament reconstruction, commonly performed in humans, is difficult in canines due to the joint size. The most frequent surgical approaches are osteotomy-based to return native biomechanical stability to the joint. Unfortunately, some dogs still have latent instability that needs to be addressed to decrease the biomechanical wear occurring on the cartilage surfaces. The TightRope fixation system has been shown to provide improved joint stability to the stifle, which is more representative of native joint kinematics. While this approach often takes additional training time, it has been hypothesized to provide extra support, especially for complex cases.

Clinical—Canine

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. *Vet Surg.* 2010;39(3):315-323. doi:10.1111/j.1532-950X.2010.00658.x

- This study compared the 6-month clinical outcomes of the TightRope repair system to an osteotomy in CCL-deficient dogs.
- A total of 47 dogs were randomized by procedure, with 24 receiving the TightRope implant and 23 receiving an osteotomy.
- Outcomes, including complications, stability, and radiographic osteoarthritis (OA) progression, as well as a client questionnaire, were collected immediately postoperatively and 6 months after surgery.
- TightRope procedure complications were reduced from 17.4% to 12.5%. While there was no significant difference in joint stability, TightRope procedures had a significantly shorter procedure time.
- There were no significant differences in radiographic OA progression or client scoring on questionnaires.

Takeaway

This study shows that the TightRope fixation system is an effective technique in CCL-deficient dogs while potentially decreasing complications and reducing surgery time.

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Knight RC, Thomson DG, Danielski A

Surgical management of pivot-shift phenomenon in a dog. *J Am Vet Med Assoc.* 2017;250(6):676-680. doi:10.2460/javma.250.6.676

- This publication was a case study of a 6.8-year-old Labrador retriever–poodle mix that showed continual pivot-shift instability 1 year following an osteotomy procedure to correct a torn CCL.
- An arthrotomy was performed and showed that there were no meniscal tears that caused continuous instability.
- There was a secondary surgery that used the TightRope fixation system, which provided improved stability at 6 weeks.
- This dog returned at 8 weeks with a torn CCL in the bilateral limb, so it underwent an osteotomy with the TightRope implant, which resolved the instability to 1 year at its final check-in.

Takeaway

The TightRope fixation system provided stability to a joint that failed a previous osteotomy procedure.

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;42(3):329-334. doi:10.1111/j.1532-950X.2013.12001.x

- The purpose of this study was to evaluate the long-term outcomes of the TightRope fixation system to TPLO and tibial tuberosity advancement (TTA).
- This was a retrospective study that analyzed 344 cases from November 2006 to May 2009, of which 152 were TPLO, 32 were TTA, and 144 were TightRope repairs.
- Overall, the TTA had significantly higher rates of major complications and meniscal tears than TPLO or TightRope repairs, while TPLO had significantly higher rates of major complications and meniscal tears than the TightRope fixation system.
- Significantly more TPLO and TightRope repair cases reached full function than TTA.

Takeaway

The TightRope fixation system and TPLO were superior in reducing complications and meniscal tears while increasing the chance of reaching full function compared to the TTA.

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Pinna S, Lanzi F, Tassani C, Mian G

Intra-articular replacement of a ruptured cranial cruciate ligament using the Mini-TightRope in the dog: a preliminary study. *J Vet Sci.* 2020;21(5):e53. doi:10.4142/jvs.2020.21.e53

- The purpose of this study was to evaluate the feasibility of using a Mini TightRope implant for the intra-articular treatment of CCL ruptures.
- This study enrolled 5 dogs weighing 8-10 kg and 2-12 years of age after completing a surgical procedure guide in a cadaveric stifle.
- The 5 dogs were followed for 12 months and were analyzed for the Bologna Healing Stifle Injury Index (BHSII) and a radiographic OA score.
- Overall, the BSHII increased from 74.3 to 95.6 at 12 months, whereas the OA score did not progress in 3 dogs and progressed 1 point in 2 dogs.

Takeaway

This preliminary study shows that an intra-articular Mini TightRope procedure of a ruptured CCL in a dog was repeatable and improved clinical outcomes while not producing rapid progression of OA.

Husi B, Park B, Lampart M, Evans R, Pozzi A

Comparative kinetic and kinematic evaluation of TPLO and TPLO combined with extra-articular lateral augmentation: a biomechanical study. *Vet Surg.* 2023;52(5):686-696. doi:10.1111/vsu.13955

- The purpose of this study was to analyze the use of TPLO with, and without, an an *Internal*Brace™ procedure. to repair a CCL disruption in a biomechanical cadaveric model.
- 10 joints were analyzed for a tibial compression test and a tibial pivot compression test, which was applied with an external and internal moment in a normal, CCL-deficient, TPLO, and TPLO with an *Internal*Brace procedure.
- There was an increase in cranial translation of the tibia with the TPLO when compared to an intact CCL.
- The TPLO with an *Internal*Brace procedure returned cranial tibial translation during the pivot compression test that was like intact CCL.

Takeaway

The TPLO returned tibial plateau angle, but still showed increased translation while adding an *Internal*Brace procedure returned translation during the pivot compression test to similar levels of a native intact CCL.

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