



Effect of the number of interference screws for the fixation of an intra-articular cranial cruciate ligament prosthesis in dogs: Biomechanical study.

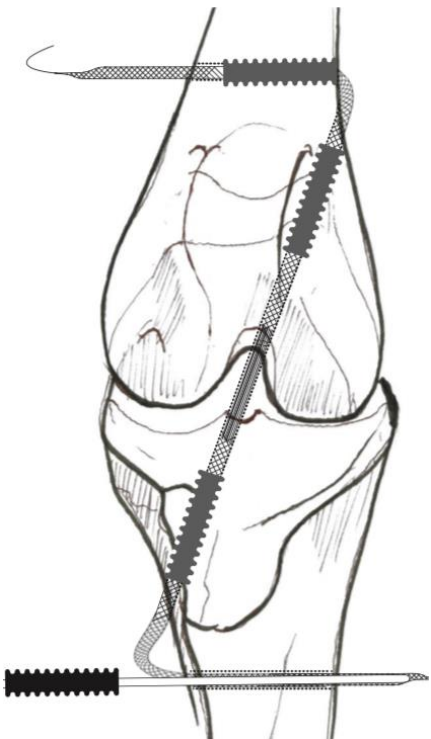


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Mechanical tests on anatomic parts

UHMWPE intra-articular ligament fixed with four interference screws is proved to be able to withstand normal walking and trotting condition in the immediate postoperative period. This technique could be reconsidered as an option for treatment of ruptured CCL in large dogs.



	Failure Load N Mean (SD)	Initial Failure N Mean(SD)	Stiffness Mean (SD)
Natural ligament	888 (201)	614 (297)	224 (30)
4 screws	690 (115)	347 (54)	132 (41)
3 screws	466 (150) *	292 (87)	116 (22)
2 screws	335 (59) * °	287 (60)	102 (38)

Table 1 Results, * relates significant difference to sound CCL; ° relates significant difference to 4 screws.

Figure 1. Surgical technique for implantation of novalig 8000



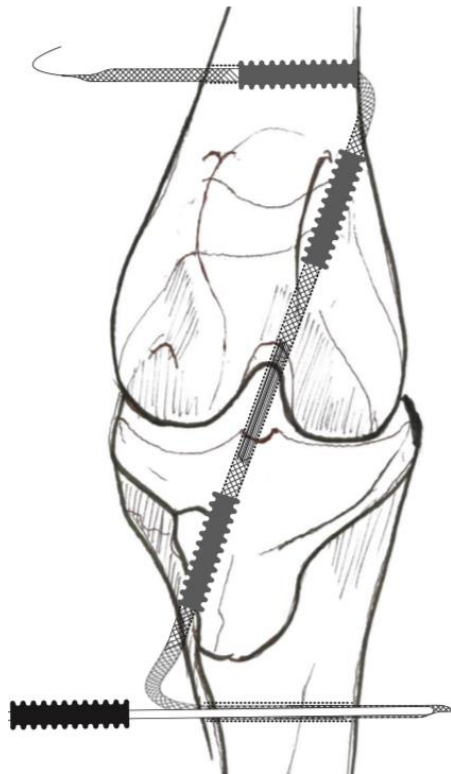
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Biomechanical analysis of a ligament fixation system for CCL reconstruction in a canine cadaver model



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Mechanical tests on anatomic parts

The values of the maximum strength between the native ligament and the Novalig 8000 implanted with 4 interference screws have no statistical difference (*ttest*, $p = 0.87$).

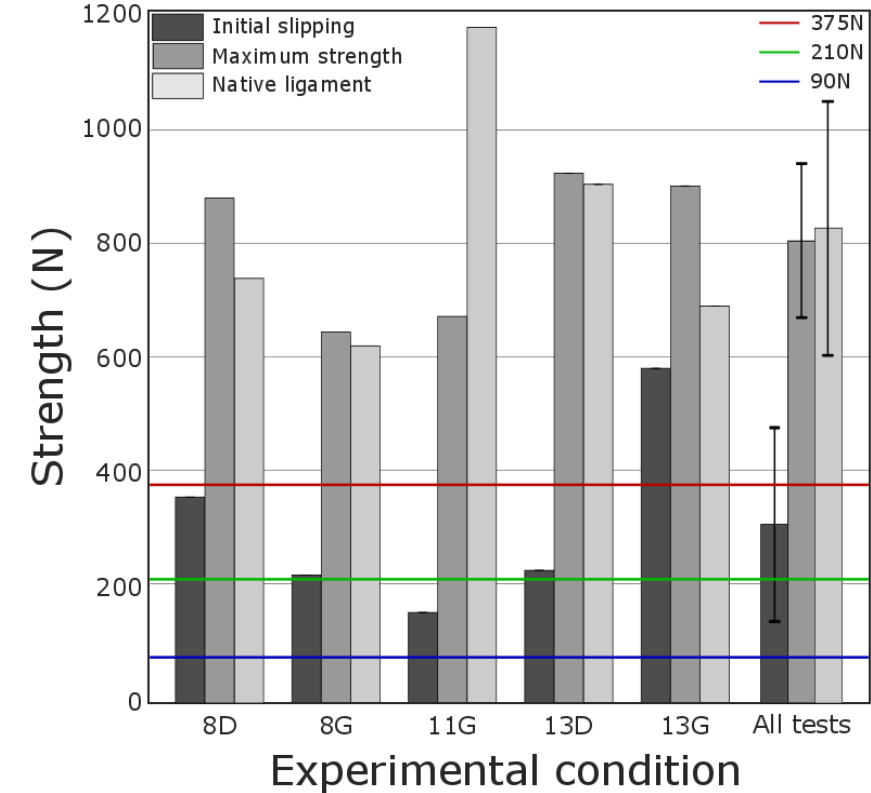


Figure 1. Surgical technique for implantation of novalig 8000

Figure 2. Histogram of the rupture load and initial slipping of 5 implanted stifles (blue: load for walk 90N, green: trot 210N, red: gallop 375N)



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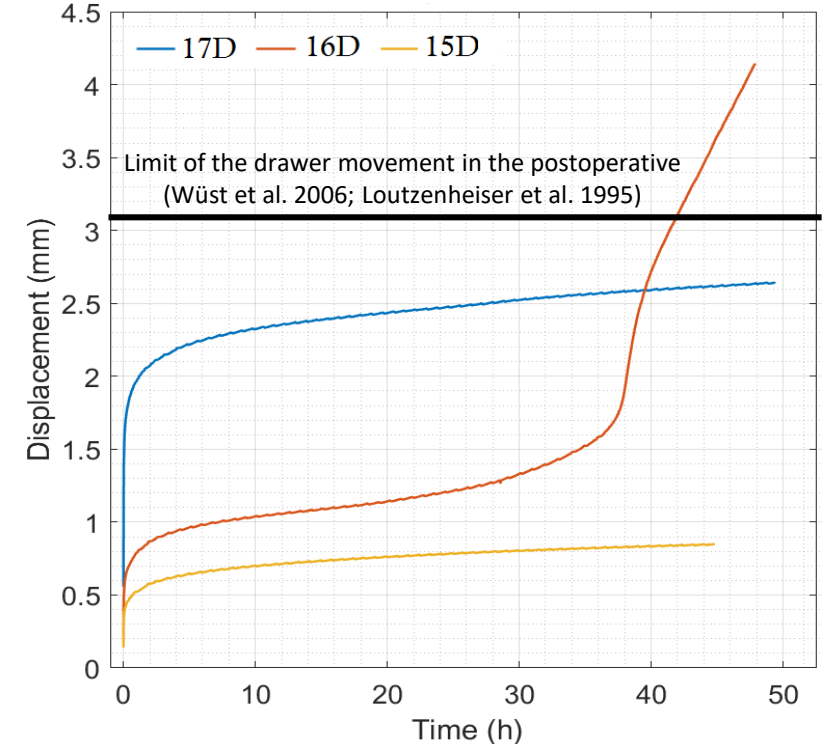
Mechanical tests on anatomic parts

Cyclic loading mechanical testing :

The dynamic rate was fixed at 0.58Hz during all the 100.000 cycles. The boundary limits were fixed at 100N of minimum pre-load, and a maximum of 210N (195N + 15N of safety) corresponding to the ground reaction force recorded for a 30 kg dog during trotting (Kim et al. 2012).

15 & 17 D ✓

16 D ✗ - Interference screw implanted in the growth cartilage



Conclusion : Regarding these results, the biomechanical performance of the fixation system allows intra-articular stabilization of the stifle with four interference screws.