

Center of Rotation of Angulation (CORA) based Tibial Plateau Leveling Osteotomy (TPLO) in dogs: 10 cases

MEJIA SR; BRUECKER KA
 Veterinary Medical and Surgical Group (VMSG), Ventura, CA

Introduction

Tibial Plateau Leveling Osteotomy (TPLO) has become a widely accepted technique to treat cranial cruciate ligament insufficiency/injury in canine patients. However, some dogs may not be candidates for TPLO due to factors such as unusual tibial anatomy, excessive tibial plateau slope, open physes, and angular limb deformity due to physal injury or a failed prior surgery. Center of Rotation and Angulation (CORA) based osteotomies are used to correct angular limb deformities such that translation is not induced. An anatomic CORA (center of rotation and angulation) based TPLO (cb-TPLO) has been described with some limitations on inherent implant stability due to the proximal nature of the CORA based osteotomy.

Objective

The objective of this retrospective study is to document initial experience and short-term follow-up with the use of a CORA based TPLO (cb-TPLO) for repair of rupture of cranial cruciate ligament (CrCl) in dogs between the years 2011 and 2014.

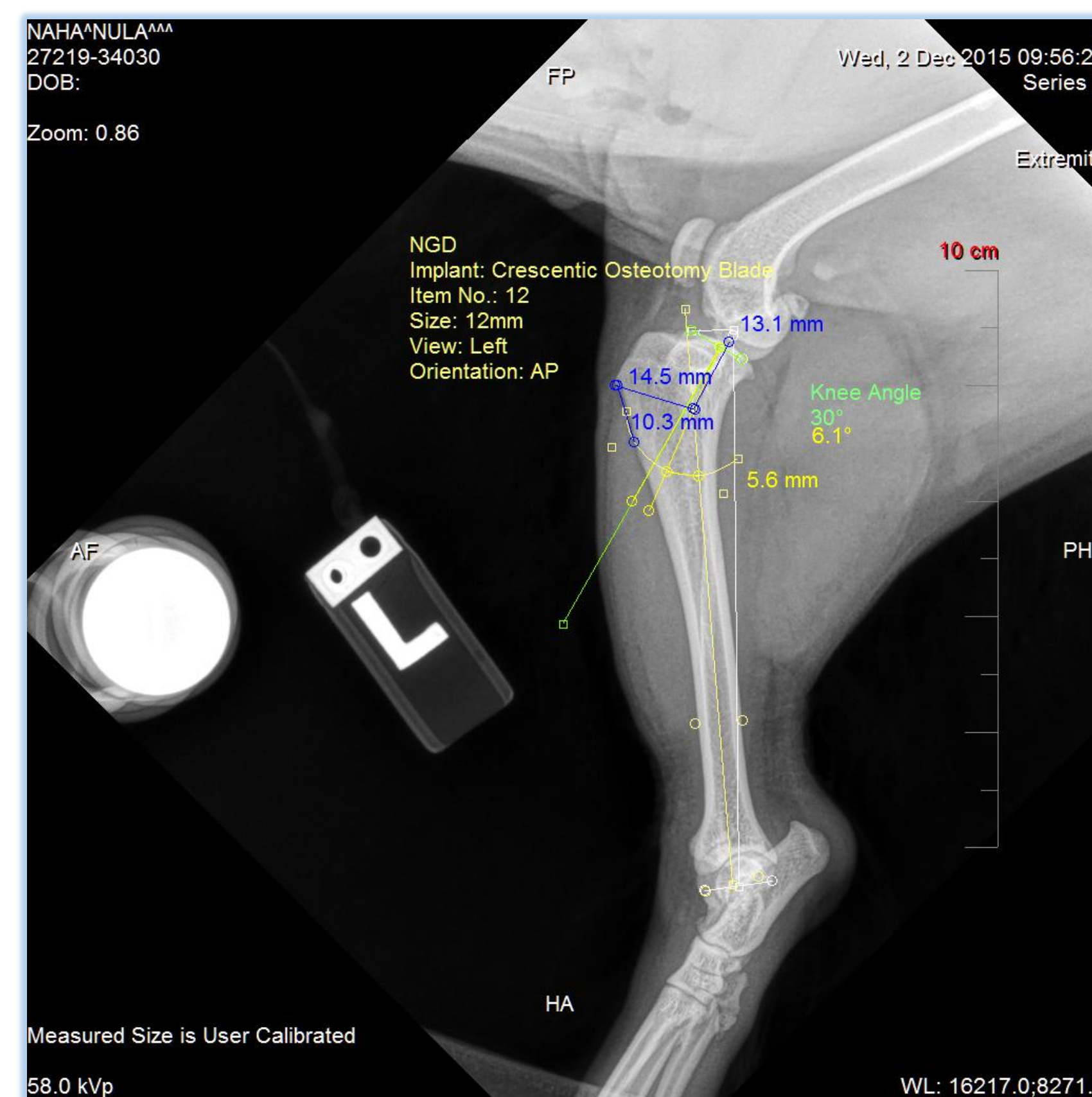


Figure 1. Pre operative radiographic surgical planning.

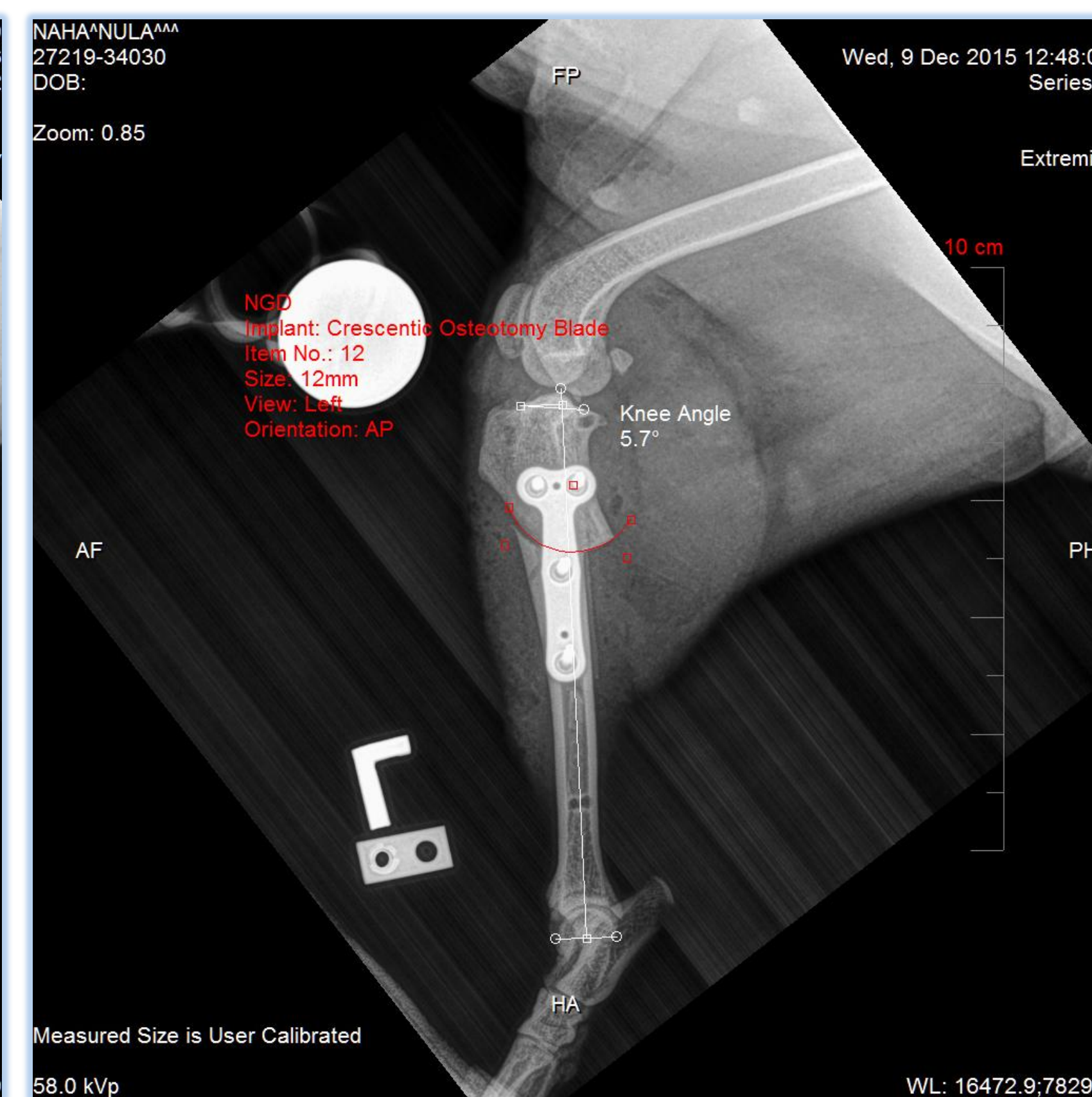


Figure 2. Post operative lateral radiograph from a patient on the study.

Materials and Methods

Medical records (2011-2014) of dogs that had rupture of the cranial cruciate ligament and had repair using cb-TPLO were reviewed. Signalment, preoperative assessment/rationale for cranial cruciate ligament repair, postoperative assessment of the repair, and complications were recorded.

Table 1: Signalment, preoperative assessment, rationale for cranial cruciate ligament repair

Case	Patient	Breed	Age	Weight (kg)	Side	Pre-op Clinical signs	Duration Clinical Signs	Complete/Partial tear	Rationale
1	A	West Highland	5yr	11.5	L	Lameness 2/4,	11-Apr	Complete	Excessive TPA
2	B	Maltipoo	7yr	4.7	R	Lameness 2/4, meniscal click	2 months	Complete	Excessive TPA
3	B	Maltipoo	8yr	5.1	L	Not reported	Not reported	Complete	Second side
4	C	Siberian Husky	14 month	32.5	L	Lameness 3-4/4 both PL	1 night L, chronic R	Complete	Excessive TPA
5	D	Maltese	9yr	7.2	R	Lameness 3/4	2 days	Complete	Second side
6	D	Maltese	8yr	7	L	Lameness 4/4	2 months	Not reported	Concurrent MPL
7	E	Boxer	4yr	19.9	L	Not reported	Not reported	Complete - absent	Excessive TPA
8	F	West Highland	7yr	7.5	R	Lameness 3/5	1 month	Complete	Excessive TPA
9	G	Dutch Shepherd mix	3yr	31.7	L	Persistent abnormal gait/patella luxation, prior L TTA and 2 MPL sx, custom brace, PT	Persistent	Absent	Previous surgical attempts (multiple) failure
10	G	Dutch Shepherd mix	3yr	30.7	R	Previous R TPLO, PT, custom brace	persistent abnormal gait	Absent	Previous surgical attempt failure

References

- Raske M, Hulse D, et al: Stabilization of the CORA Based Leveling Osteotomy for Treatment of Cranial Cruciate Ligament Injury Using a Bone Plate Augmented with a Headless Compression Screw. Vet Surg 2013; 42: 759-764.
- Castaneda, K; Bruecker, KA, TPLO (Tibial Plateau Leveling Osteotomy) Based on Center of Rotation and Angulation (CORA): Description of Pre-Surgical Planning and Surgical Technique.

Results

- Four dogs underwent unilateral surgical repair and three dogs staged bilateral repair using cb-TPLO for a total of 10 procedures.
- Ages of dogs ranged from 1 to 9 years
- Mean age at surgery was 5.5 years.
- Satisfactory healing occurred in 100%
- Minor complications occurred in 4 of these 10 procedures 40% (complications were easily resolved).
- Minor complications included (4 cases)
 - mild hyperextension of the left hock at the 11-week recheck that resolved with physical therapy (concurrent hip dysplasia)
 - mild lameness and instability at the 6-week recheck with a TPA of 14 degrees, resolved with a lateral fabellar to tibia suture
 - Actinomyces infection at week 3 with osteomyelitis that resolved with antibiotics and rest only.
 - Re-injury due to falling off couch at 6 weeks post op and osteomyelitis (no implant removal nor culture performed) that resolved with antibiotics and rest only.
- Only one major complication 10% (defined as requiring subsequent surgical intervention or malunion). The one major complication had a collapse of the lateral buttress and mild valgus deformity at the 4-week recheck. Patient was 85% sound at a walk. At the 11-week recheck, patient demonstrated satisfactory healing. At the 39-week final recheck, patient demonstrated a healed cb-TPLO with no lameness.

Discussion/Conclusion

- In this study, 40% of the cases (4 of 10 cases) had complications in the short term.
- Minor complications could be attributed to concurrent factors and were most likely not secondary to the cb-TPLO procedure.
- All minor complications were resolved without further surgical intervention.
- One major complication was detected at 4 weeks post op consisting of minor collapse of the lateral buttress and mild non-clinical tibial valgus. This short-term complication resolved without further surgical intervention.
- There were no surgical failures.
- The cb-TPLO technique as described provides an alternate treatment option in cases where previous surgical attempts had failed and required revision, where anatomic consideration may have precluded the options of a TPLO, TTA, TWO, or other osteotomies, or in juvenile patients with open growth plates.