Recent studies have shown joint mechanical alteration that may be contributory to articular cartilage lesions noted on 2nd look arthroscopy. When rotated to the recommended 5 degrees, the long-term effect is loss of compliance of cranial supporting structures such as the fat pad and joint capsule. Encroachment of the cranial supporting structures (joint capsule) on the cranial articular surface of the medial/lateral femoral condyles can result in abrasion of the articular cartilage.

The subject of this presentation is to report the concept and technique of a tibial plateau leveling osteotomy based on the anatomic CORA. The concept is supported by anatomic dissection, radiographic analysis of treated cadaver specimens, and application in clinical cases having ligament injury to the stifle (600+ cases). Clinical cases include those with multiple ligament injury, acute complete CCL injury with marked craniocaudal and rotational instability, partial stable CCL injury, and partial unstable CCL injury. Dogs with excessive slope (> 34 degrees) and juvenile dogs with active, open proximal tibial physis are also included as are cases with concurrent patella luxation. Clinical outcome, complications unique to the technique, and strategies to prevent complications will be addressed.

Advantages of the technique include:

- Preservation of the proximal tibial epiphysis which allows for: 1. Application of ancillary stabilizing procedures, 2. Increase bone contact and compression of the entire osteotomy facilitating early bone union, 3. Increase bone target for additional implant application for large and giant breeds of dogs, 4. Preservation of the proximal tibial growth plate in juvenile dogs with CCL injury, 5. Facilitates treatment of dogs with excessive slope, protects CrCl and intra-articular grafts. The location of the anatomic CORA is such that an osteotomy can be performed which preserves the anatomy of the proximal tibial epiphysis. An intra-articular reconstruction using bone tunnels or the under and over technique is readily accomplished. Likewise, if the attending surgeon wishes to apply an extra-articular stabilizing procedure it is easily accomplished with the ample bone target of the proximal tibial epiphysis following rotation. The authors have used isometric placement of Fibertape with a Swivelock or IA reconstruction with an autogenous graft. The dome shape of the osteotomy coupled with the axis of correction (ACA) being located at the CORA creates maximum bone contact without secondary translation. The forces acting on the osteotomy are directly over the tibial diaphysis reducing the bending moment generated via weight bearing. The result is early primary bone union. Juvenile cases with active growth plates are readily managed without interrupting the function of the growth plate since the osteotomy and plate/screws are located distal to the physis.

Figures on left show deranged stifle corrected with a CBLO and SwiveLock. Figure on the right shows an IA graft 8 weeks PO and same dog at 6 yrs PO.
Figures on the left show a dog with excessive slope (42 deg) managed with a CBLO double cut. Note the tibial epiphysis is centered on the Tibial diaphysis. Figures on the right show early primary bone union due to improved stability secondary to compression and bone contact because of the dome shape of the osteotomy.

**Preventing late onset articular cartilage lesions:** Leaving 8 – 12 degrees tibial slope (depending on the original slope) retains a limited amount of anterior thrust. The Authors believe this will maintain compliance of anterior soft tissues (joint capsule, fat pad) and prevent abrasive articular cartilage face lesions. Additionally, a percentage of leveling osteotomy cases (TPLO) rotated to 5 degrees present with late onset weight bearing articular cartilage lesions. This may be secondary to abnormal joint contact mechanics. The CBLO rotates the plateau to 9 – 12 degrees and preserves a limited amount of cranial translation (normal cranial translation is 3-4 mm).

Figures left & center: femoral condyle and another case with tibial plateau articular cartilage loss. ; figure on the right shows 2nd look of a CBLO 19 months PO. No Grade 3/4/5 lesions have been seen following CBLO with forty two 2nd looks with a median post-operative time 12 months.

**Protect against continual cranial cruciate ligament failure by elimination of excessive cranial tibial thrust**

Figures show torn anteromedial band (left) and a case with torn posterolateral band (right) at initial surgery and 11 months PO
Facilitate management of ACL injury in small breeds of dogs treated with a leveling osteotomy: Small breeds of dogs are readily managed allowing easier stabilization because of a larger proximal bone segment (tibial epiphysis). There is no “balcony” effect as a result of secondary translation as seen with a TPLO.

Image on left is a Westie with an initial 42 degree slope treated with a CBLO. Image on the right is a small breed dog managed with a TPLO. Note the secondary translation/balcony effect.

Dogs with concurrent medial patella luxation are readily managed with CBLO and traditional techniques for stabilization of the patella.