



COMPLICATIONS ASSOCIATED WITH SPECIFICALLY DESIGNED PLATE FOR LATERAL CLOSING WEDGE DISTAL FEMORAL OSTEOTOMY TO CORRECT DISTAL FEMORAL VARUS IN PATIENTS WITH MEDIAL PATELLAR LUXATION.

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Introduction:

- **Excessive distal femoral varus** results in malalignment of the quadriceps mechanism and contributes to **medial patella luxation**.
- A **lateral closing wedge distal femoral osteotomy (DFO)** is often required to correct excessive distal femoral varus.
- New Generation Devices now manufactures a specifically designed **DFO locking plate**.
- The plate is contoured to the distal femur and accepts 3 screws in the distal fragment.

Objective:

The purpose of this retrospective study was to evaluate the short-term complications of the use of the New Generation Devices (NGD) distal femoral osteotomy (DFO) plate in the correction of distal femoral varus in patients with medial patellar luxation.

Materials and Methods:

The computer record system at the Veterinary Medical and Surgical Group was searched for case reports of dogs treated by lateral closing wedge distal femoral osteotomy (DFO) for medial patella luxation for this retrospective study. Limb alignment radiographs or CT or both were examined. The distal femoral varus was measured using anatomic femoral angle, mechanical femoral angle and/or functional limb varus by one investigator (KAB).

All patients were available for follow-up for a minimum of 2 months post-operatively.

Functional Limb Varus (FLV):

- In many patients with distal femoral varus, a proximal tibial valgus is also present.
- Establishing the functional hind limb axis (FHLA) permits measurement of the functional limb varus (FLV) which takes the entire limb into account and thereby lessens risk of over-correction and formation of lateral patella luxations post-operatively.
- The FLV and FHLA are measured from CT or craniocaudal radiograph as shown in Figure 1.

Acknowledgments:

The locking distal femoral osteotomy plate is manufactured by New Generation Devices, Inc ®.

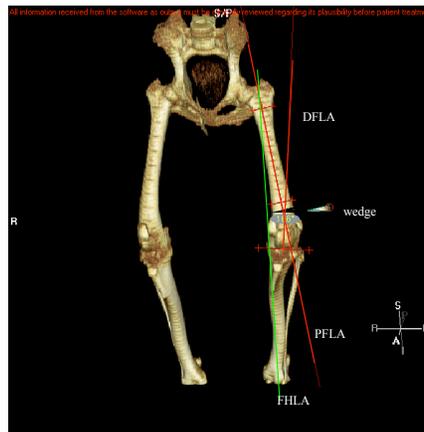


Figure 1. Determination of the FLV. Using 3-D reconstruction of a pelvic limb CT, a true cranial-caudal image can be acquired for pre-surgical planning. To establish the FLV: The proximal femoral long axis (PFLA, red line) is drawn. A line from the origin of the PFLA to the center of the talus establishes the FHLA (green line). The FLV is the angle between the PFLA and the FHLA. The amount of correction necessary can then be calculated. Using Pre Operative planning programs, the wedge can be simulated based on Center of Rotation of Angulation (COR) principles using the distal femoral long axis (DFLA) and the PFLA.

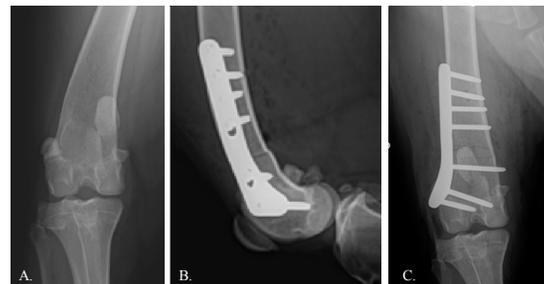


Figure 2. Pre- and post-operative radiographs from patients of the study.
 A. Preoperative craniocaudal radiograph exhibiting medial patella luxation and distal femoral varus.
 B. Postoperative lateral radiograph showing use of the NGD plate. Four screws proximal to osteotomy site and three screws distally.
 C. Postoperative craniocaudal radiograph. Note the patella's position within the trochlear groove and the improved alignment of the limb.

Results:

- Ten dogs were included in this study. Two dogs underwent staged bilateral correction, making a total of twelve procedures between May 2004 and July 2006. (Figure 2).
- The **average MPL** was grade III/IV.
- **Tibial tuberosity transposition** was performed in 6/12 limbs.
- **Recession wedge sulcoplasty** was performed in 9/12 limbs.
- All limbs were treated by **medial desmotomy and lateral imbrication**.
- **Concurrent cranial cruciate ligament rupture** was noted in 2 dogs and tibia plateau leveling osteotomy (TPLO) was performed at the time of surgery.
- A **lateral anti-rotational suture** was placed in 5/12 limbs.
- Locking screw placement varied based on surgeon's preference at time of surgery.

Complications:

- No intraoperative complications were noted.
- Minor complication included seroma formation at DFO plate site in 2 dogs. No loosening of implants was noted.
- One month after surgery, one dog acquired a mid-femoral long oblique fracture due to a stress-riser created by the proximal jig pin. It was repaired with cerclage wire and IM pin which failed and was then repaired with an interlocking nail. Three months after second repair, the patient was diagnosed with quadriceps contracture.
- This was the only major complication noted in the study.

Conclusion:

The specifically designed New Generations Devices DFO plate appears to be a successful implant for DFO procedure in patients with medial patella luxation. Complication due to stress-riser from proximal jig pin may be resolved by placing the proximal jig pin so that one screw will be proximal and one screw will be distal once the plate is applied.

References:

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