

Paper #132 Lateral Opening Wedge Distal Femoral “V” Osteotomy: Biomechanics Comparison Between Angles Of 60° And 90° In Sheep. *Joao Luiz Ellera Gomes*, Porto Alegre, Brazil, *Luiz Roberto S. Marczyk*, Porto Alegre, Brazil, *Roberto Pedersen Ruthner*, Porto Alegre, Brazil, *Luis Marcelo Muller*, *Presenter*, Hospital de Clínicas de Porto Alegre, Porto Alegre, Brazil, *Guilherme Velho Caputo*, Porto Alegre, Brazil

Objective: Distal femoral osteotomy has been widely described with several different techniques in the literature; however, there isn't consensus in the fixation and type of osteotomy. Distal “V” osteotomy has shown as an option, however the best apex angle still is controversial. The goal of this work is to verify if osteotomy in “V” accomplished with apex of 60° and 90° in femur of sheep show statistically significant difference when submitted to a compression axial force.

Method: Thirty sheep left femur were used in this study and each one was dissected, withdrawing their muscular inserts and ligaments, keeping just periosteum, and it was accomplished a subtrochanteric osteotomy, scoring the proximal portion of the same. The bones were randomized in two groups, containing 15 pieces each one. In group 1, the bones were submitted to distal osteotomy, in the supracondylar region with apex of 90°

between cuts. In group 2, the cut was in the same region, however with apex of 60°. Osteotomy was performed in "V" shape, with distal apex, from the lateral femur, remaining intact the medial cortical. The pieces were submitted to compression tests, extracting four deformation curve points and inserted in a numeric interpolation program that calculated the deformation reason.

Results: Group 1 showed a mean (sd) resistance force to the compression of 232 Kgf ($\pm 59,551$), while group 2, a mean resistance force of 157,13 Kgf ($\pm 67,4$). This difference was statistically significant ($p = 0.000619$, Kruskal-Wallis) in favor of group 1.

The maximum point reached by the compression force was determined by the continuity loss between fragments proximal and distal of the femur, that showed two behavior kinds. The first was characterized by the fracture in the intercondilar region provoked by the osteotomy apex compression action on the intercondilar region. In second type, it was observed periosteal medial continuity loss with fracture of the medial side of the supracondilar shaft of the femur.

In group 1, there wasn't a predominance of any kind of fracture (8 fractures type 1 and 7 fractures type 2), whereas in group 2, the fractures type 2 were predominant, with 10 occurrences; however, there wasn't statistically significant difference between both groups of fractures ($p > 0.05$).

Conclusions: Osteotomy with apex of 90° showed greater compression resistance, because of the smaller weakness of the distal portion of the femur after the osteotomy. There wasn't a homogeneous distribution of the types of fracture generated by the compression force regarding the osteotomy angle.