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Correction of Tibiofemoral Subluxation after High Tibial Osteotomy: Prospective Comparative Study of Lateral Closing Versus Medial Opening Wedge Osteotomy

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Summary:
T-F subluxation was well corrected after CW and OWHTO and degree of T-F subluxation correction was not different between two groups

Abstract:
Purpose: Tibiofemoral (T-F) subluxation is a common finding in the medial compartment osteoarthritis of knee with varus deformity. But the degree of T-F subluxation correction after high tibial osteotomy (HTO) and variables related to the T-F subluxation were not understood well. The purposes of this study were 1) to compare correction of T-F subluxation after lateral closing wedge (CW) and medial opening wedge (OW) HTO and 2) to find the variables related to the T-F subluxation.

Methods: In this prospective randomized comparative study, 30 unilateral CWHTO's and 30 unilateral OWHTO's for medial compartmental osteoarthritis with 1 year follow up were analyzed. The hip-knee-ankle (H-K-A) angle, T-F subluxation, Knee Society Knee Score (KSKS), Knee Society Function Score (KSFS), Hospital for Special Surgery (HSS) score, Visual Analogue Scale (VAS) were measured preoperatively and 1 year postoperatively. Pearson's correlation analysis was conducted to find the variables related to preoperative and postoperative 1-year (residual) T-F subluxation.

Results: The mean T-F subluxation changed from 3.9±2.3mm to 1.4±1.4mm ($p < 0.01$) after CWHTO, while it changed from 4.3±1.8mm to 1.4±1.5mm ($p<0.01$) after OWHTO. The mean T-F subluxation correction was not different between two groups (2.5±2.0mm in CWHTO versus 2.9±1.9mm in OWHTO, $p=0.36$). Correlated variables for preoperative T-F subluxation were preoperative H-K-A angle ($r=0.43$, $p=0.01$), KSKS ($r=-0.42$, $p<0.05$), VAS ($r=0.38$, $p<0.05$) in CWHTO group while preoperative H-K-A angle ($r=0.47$, $p<0.01$), VAS ($r=0.52$, $p<0.05$) in OWHTO group. Residual T-F subluxation was significantly correlated with preoperative T-F subluxation in both groups ($r=0.52$, $p<0.01$ in CWHTO versus $r=0.37$, $p<0.05$ in OWHTO) but it was not correlated with any of postoperative clinical scores in both groups ($p>0.05$). KSS, HSS, VAS score improved significantly in both groups ($p<0.01$).

Conclusion: T-F subluxation was well corrected after CW and OWHTO and degree of T-F subluxation correction was not different between two groups. Although, preoperative T-F subluxation was one of possible reason for poor clinical scores, residual T-F subluxation was negligible and did not affect any of the postoperative clinical scores in both groups.