

Comparison of Patellofemoral Geometry Between Opening Wedge and Hybrid High Tibial Osteotomy

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Summary:

Hybrid High Tibial Osteotomy is better than Opening Wedge in patellofemoral geometry.

Abstract:

Introduction: Opening wedge high tibial osteotomy (OWHTO) is a successful treatment option for uni-compartmental OA. However, changes of patellar height and tracking may be affected and HTO causes significant unfavorable changes in the patellofemoral mechanics. Hybrid HTO is a novel surgical procedure combining OWHTO and closed wedge HTO. The purpose of this study was to compare the patellofemoral geometry after OWHTO and hybrid HTO and determine the indication for varus knee with patellofemoral malalignment.

Methods: Thirty-three OWHTO and 12 hybrid HTO were enrolled in this study. The average age was 66.9 ± 8.4 in hybrid HTO and 63.0 ± 7.9 in OWHTO, which were no significant difference. Correction angle and percent mechanical axis (%MA) with HTO were measured pre- and post operatively. To clarify the alternation of PF geometry, patella height was evaluated with Insall-Salvati (IS) ratio and Caton-Deschamps (CD) index. Patellofemoral malalignment was analyzed by patellar tilt Trochlear groove-tibial tuberosity distance (TT-TG). Joint space narrowing at lateral facet was measured for patellofemoral compression. All these were elucidated at pre- and post operative at 6 months.

Results: Correction angle in hybrid HTO was 12.5° , which was significant higher than in OWHTO (8.9° , $p < 0.01$), while no significant difference was shown in postoperative %MA. Patellar tilt, IS and CD were no significant difference between two groups, however Δ CD, which was the difference between pre and postoperative CD, were significantly decreased in OWHTO ($p < 0.01$) whereas it was no difference in hybrid HTO. Postoperative TT-TG in hybrid HTO was significantly decreased rather than OWHTO ($p < 0.01$). Delta joint space narrowing in hybrid was increased rather than OWHTO ($p = 0.03$).

Conclusion: It is considered an advantage of hybrid HTO over OWHTO regarding PF geometry. Hybrid HTO might have better indication for varus knee with PF malalignment.