Is Implant Removal Necessary After Medial Open Wedge High Tibial Osteotomy?

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Summary:
Implant removal after MOWHTO reduced implant-related pain and improved Lysholm score and Tegner score. Even after implant removal, gap filling is gradually increased. No correction loss was found 2 years postoperatively in all patients. This result suggests that implant removal after MOWHTO is a valuable operative intervention.

Data:
Objective: There have been few studies that evaluated clinical and radiographic assessments after implant removal following medial open wedge high tibial osteotomy (MOWHTO). The purpose of this study was to prospectively (1) to determine whether implant removal provides pain relief and functional improvement, (2) to investigate the progression of osteotomy gap filling on serial plain radiographs, and (3) to evaluate whether alignment correction could be maintained after implant removal following MOWHTO. Materials and Methods: MOWHTOs were performed without bone graft between March 2014 and September 2017. The guidelines for implant removal were (1) all patients received a recommendation to undergo elective implant removal after gap filling of more than 80% was observed at >1 year follow-up, (2) the patients who ask for implant removal due to implant-related pain even though gap filling of less than 80% are permitted to undergo implant removal when postoperative time reaches 1 year. Patients with a minimum follow-up period of 2 years after implant removal were included in the present study.

Implant-related pain was defined as either tenderness over the implant site or discomfort at the implant site with daily activities. The severity of implant-related pain was estimated using a visual analog scale on which 0 meant no pain, 1 to 3 meant mild pain, 4 to 6 meant moderate pain, and 7 to 10 meant severe pain. Clinical and functional evaluations were performed using Lysholm score and Tegner score. The gap filling rate was measured as the length of the newly formed bone among the overall length of the osteotomy. Postoperative alignment correction and its maintenance were assessed using four radiologic parameters: the weight-bearing line (WBL) ratio, the hip-knee-ankle angle (HKA), the medial proximal tibial angle (MPTA) and the posterior tibial slope angle (PTSA). Results: Sixty patients underwent MOWHTO during this study period, but five patients failed to follow-up for more than 24 months after implant removal. A total of 55 patients were enrolled in this study. 51 (92.7%) patients exhibited implant-related pain at implant removal (mild in 43 patients, moderate in 8 patients). At 1 and 2 years after implant removal, mild pain was 6 (10.9%) patients and 5 (9.1%) patients, respectively. The other patients had no implant-related pain. After implant removal, the Lysholm score improved from 77.0±5.6 to 86.8±5.7 (P<0.05), and Tegner score improved from 3.3±1.2 to 3.9±1.3 (P<0.05). However, there was no statistically significant difference between 1 year and 2 years after implant removal. At implant removal, the mean gap filling rate was 84.4±9.6% (range, 60.1%–100%). At 1 and 2 years after implant removal, the mean gap filling rates increased to 93.7±5.4% (75.7%-100%) and 97.4±2.6% (85%-100%), respectively (P<0.001). For the WBL ratio, MAA, MPTA, and PTSA, no statistical differences were found between the follow-up radiographs performed at implant removal, 1 and 2 years after implant removal. Conclusion: Implant removal after MOWHTO provides reduced implant-related pain and improved functional scores. After implant removal, gap filling is gradually increased. No correction loss was found 2 years postoperatively in all patients.

Category: Knee - Osteotomy

The Compensatory Theory in Proximal and Distal Joint Alignment and Gait in Varus Knee Osteoarthritis Treated With High Tibial Osteotomy: A Systematic Review

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Summary:
A systematic review into the proximal and distal joint alignment and gait in varus knee osteoarthritis (OA). This coronal malalignment is compensated for by static and dynamic adjustments in the position of the adjacent joints, principally in the hindfoot & ankle. This condition can be treated in selected patients by high tibial osteotomy (HTO), stabilised with a fixed angle plate plate or circular frame, which may reverse these changes. The aim of this systematic review is to determine the evidence available for these compensatory mechanisms with the objectives being to improve deformity planning and optimise patient outcomes. Method: A systematic review with meta-analysis was designed using the PRISMA template to meet the research aim & objectives. Results: A total of 1,006 patients (1,020 knees), combined mean age 54.5 years, female:male ratio of 0.91, were extracted from 20 included studies. The methodologies of the majority of studies were at high risk of bias on the Newcastle-Ottawa Scale demonstrating significant heterogeneity. The combined mean change in the HKA axis was 7.7°; MPTA 7.4°; TT, 0.21°; T1 4.56° & AJLO 4° valgus. Conversely, operative hindfoot valgus compensation reverts towards neutral post-HTO. There is limited evidence available for a direct relationship between alignment and gait parameters. Conclusions: An inverse relationship between ankle and hindfoot alignment in varus deformity of the knee forms the basis of this compensation theory. In cases with significant hindfoot compensation, the reconstructive orthopaedic surgeon may consider angulation-translation HTO rather than the standard angulation-only approach, in order to optimise alignment.