OBJECTIVE: The main purpose of the present study was to evaluate if a varus-valgus constrained TKA can provide sufficient stability in the presence of a complete MCL insufficiency. Secondarily, we aimed to evaluate which are the main parameters related to stability in the setting of a varus-valgus constrained TKA performed at complete MCL insufficiency. MATERIALS AND METHODS: Forty-two experienced knee surgeons performed a TKA and subsequent revision TKA in 42 fresh frozen cadaver knees. After revision TKA, trials were assembled and introduced. The following data was collected: femoral size, tibial size, and polyethylene trial insert size. The polyethylene trial insert was then removed and gap measurements data were collected using two spreaders with femoral and tibial trials positioned. A complete transverse mid-substance MCL lesion was made and valgus stability under maximum manual stress at 30 and 90 degrees was applied to evaluate stabilization. Consecutively thicker constrained inserts were tested until valgus stability was obtained or the knee exhibited 15 degrees of flexion due to overstiffening of the extension gap by the insert. T-student tests for quantitative variables and chi-square or Fisher tests for categorical variables were conducted. A power analysis was performed resulting in a minimum sample size of 26 specimen for a power of 80%, considering a fixed type I error at 5%. RESULTS: Upon maximum valgus manual stress testing of the MCL-deficient revision TKA knee, 31% of constructs (13 specimens) presented sufficient stability without unacceptable flexion contracture. All the dislocations with the thickest polyethylene insert without unacceptable flexion contracture happened at 90 degrees with concurrent extensor mechanism lateral displacement. The most notable finding was the absence of resulting stable constructs from specimens with a previously unbalanced flexion gap. When assessing for differences between stable and unstable final constructs, stable constructs displayed significantly (p < 0.015) smaller polyethylene insert size after MCL lesion. No statistically significant differences were found for femoral component size, tibial component size, femoral-tibial component size ratio or polyethylene insert size before MCL transection. CONCLUSION: Varus-valgus constrained implants were able to address one-third of the evaluated knees with complete MCL insufficiency, with all dislocations of the remaining two-thirds presenting only under maximum valgus manual stress at 90 degrees of flexion. These findings suggest that a varus-valgus constrained implant can be sufficient to address a complete MCL insufficiency in a considerable number of cases as it is unlikely the patients in the clinical settings will be submitted to similar stress at 90 degrees as the maximum manual valgus test at daily living activities.

Category: Knee - Arthroplasty

Out-Patient Total Knee Arthroplasty Exchange. A Feasability Study

Abstract ID# 23437
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Summary: TKA exchange is feasible as an out-patient procedure, by selected patients, even in cases of periprosthetic infection, without increasing the risk of complication.

Data: Introduction Out-patient total knee arthroplasty (TKA) is an effective and validated procedure, even if many surgeons are afraid of an increased complication rate or delayed treatment of complications. Out-patient TKA exchange may be more challenging than primary cases, and may lead to increase the complication rate. The goal of this study was to assess the feasibility of an out-patient TKA exchange procedure in an academic setting and to control that the complication rate is not dramatically increased in comparison to in-patient TKA exchange. Methods A prospective, observational study was conducted. 150 out-patient TKA exchanges were included. Out-patient procedure was selected if the patient was not living alone at home, had a maximal ASA score of 2, and have his consent to this procedure. In-patient procedure was applied for other patients. All cases were operated on by two senior surgeons experienced with primary and revision TKA. Surgical and anesthetic procedures were standardized. The postoperative pain treatment algorithm was identical for all patients. All patients followed a fast-track rehabilitation process with ambulation and full weight bearing on the day of surgery and use of crutches on request. All patients were discharged home with supervised physiotherapy. All patients were followed up to three months. Complications, rehospitalizations and reoperations were collected, and their rates were compared in the two groups by appropriate statistical tests. The severity of the complications was assessed according to the Clavien-Dindo classification and compared in the two groups by appropriate statistical test. Results 150 case were included. There were 84 women and 66 men with a mean age of 71.4 years. The reason for TKA exchange was infection in 86 cases, aseptic loosening in 44 cases, instability in 12 cases and patella maltracking in 8 cases. 32 cases were eligible to out-patient procedure (21%) and 128 cases were operated as in-patients. No patient refused this proposal. No failure of the out-patient procedure leading to unplanned patient stay was observed. No difference was observed in the two groups when analyzing complication rate, Clavien-Dindo score, rehospitalization rate and reoperation rate. No complication related to the out-patient antibiotic treatment was observed by septic cases, and all cases were infection free after three months. Conclusion TKA exchange is feasible as an out-patient procedure, by selected patients, even in cases of periprosthetic infection, without increasing the risk of complication.

Data: Category: Knee - Arthroplasty

Kinematics During Total Knee Arthroplasty Using the Navigation System Out-Patient Bearing CR vs. Fixed Bearing CR

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Summary: In this study, mobile bearing CR TKA showed significantly greater posterior translation of the lateral femoral condyle in the 90° to 120° flexion position.

Data: [Purpose] In recent years, there have been many reports on intraoperative kinematics in total knee arthroplasty (TKA) using navigation systems, in addition to those examining clinical outcomes and alignment. This study aimed to compare the intraoperative kinematics of mobile bearing and fixed bearing TKA using intraoperative navigation data. [Methods] Forty patients (8 males and 32 females) underwent TKA. Implants were used in 20 patients with e-motion CR (Aesculap) in the mobile bearing group and Columbus CR (Aesculap) in the fixed bearing group. Surgery was performed using the OrthoPilot Navigation System (Aesculap) with a medial stabilizing technique. The amount of posterior translation (mm) of the lateral femoral condyle and medial femoral condyle to the tibia was calculated from the intraoperative data from 0° to 120° by 15°. The amount of posterior translation of the lateral femoral condyle and medial femoral condyle at each flexion angle between the two groups was compared. [Results] The posterior displacement of the femoral epicondyle at 15° and 30° was 0.06 mm and 0.8 mm in the mobile bearing group and 1.5 mm and 1.1 mm in the fixed bearing group. On the other hand, the posterior displacement of the external femoral condyle at 90°, 105°, and 120° was 2.6 mm, 5.5 mm, and 6.2 mm in the mobile bearing group and 0.2 mm, 0.7 mm, and 1.5 mm in the fixed bearing group, respectively, with the mobile bearing group showing significantly greater posterior displacement. There was no significant difference in the amount of posterior translation of the external femoral condyles at 45°, 60°, 75°. The amount of posterior translation of the endocondyle of the femur at 15°, 30°, and 45° was 0.03 mm, 0.1 mm, and 0.1 mm in the mobile bearing group and 1.7 mm, 2.6 mm, and 2.7 mm in the fixed bearing group, respectively, showing significantly smaller posterior translation in the mobile bearing group. There was no significant difference in the amount of posterior shift of the medial femoral condyle from 60° to 120°. [Discussion] In this study, mobile bearing CR TKA showed significantly greater posterior translation of the lateral femoral condyle in the 90° to 120° flexion position. In a normal knee, the medial femoral condyle hardly moves back and forth until 120° of flexion, while the lateral femoral condyle moves backward in medial pivot motion. Mobile bearing TKA may show intraoperative kinematics closer to those of the normal knee than fixed bearing CR TKA.