Rates of total knee arthroplasty and subjective score progression based on the location and severity of knee osteoarthritis

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INTRODUCTION:
Factors that lead to a total knee arthroplasty (TKA) include clinical symptoms and radiographic evidence of osteoarthritis (OA).[1–9] However, due to discrepancies between radiological and clinical symptoms, there is a paucity in the literature as it relates to nonoperative symptom progression and rate of TKA based on OA location and severity. Having the ability to educate patients on the likelihood of their outcome when diagnosed with OA would be valuable, therefore, the purpose of this study was to determine differences in nonoperative outcomes and rates of TKA based on the location and severity of knee OA.
METHODS:
From 2013-2019, 337 patients diagnosed with knee OA were enrolled into the study and divided into 9 groups based on their maximum radiographic grade of joint space narrowing (mild/moderate/severe) and location (medial/lateral/patellofemoral (PF)). Mild OA was defined as joint space narrowing less than 50%, moderate was greater than 50%, and severe was complete joint space narrowing. Patients were excluded if they had more than one compartment with the same maximum grade. After enrollment, all patients participated in a standard rehabilitation program focusing first on stretching to improve range of motion followed by strengthening to reach levels equal to the opposite knee. Patients were further categorized as TKA yes or TKA no, which was retrieved from a surgical database or via survey response from the most recent patient contact, a mean of 49 months from enrollment (range, 1-88 months). Knee Injury and Osteoarthritis Outcome Scores (KOOS) were collected at enrollment, 1, 3, 6, and 12 months after enrollment. Patients stopped completing surveys after deciding to have a TKA.
RESULTS:
Patients with medial compartment OA showed statistically significantly different rates of TKA between grades (mild 9%, moderate 20%, severe 43%), $p<.001$. For lateral and PF compartments, the rate of having a TKA increased as the severity increased, however, no statistically significant differences were found. Patients with severe OA were found to have statistically significantly different rates of TKA based on location (medial 43%, lateral 17%, PF 9%), $p=.001$, however no differences were noted for mild or moderate OA. Subjective KOOS scores were statistically significantly higher for those in the TKA no group at 3 (no 70, yes 55) and 6 (no 69, yes 59) months, $p<.05$. Patients that showed no improvement or got worse on the KOOS from 1 to 3 months were more likely to have surgery compared to those that improved in the same timeframe (OR = 4.8, $p<.001$). There was not a statistically significant difference in KOOS scores at enrollment based on OA severity, however, a statistically significant difference was found at 3 months after enrollment (mild 77, moderate 69, severe 62), $p=.022$.
DISCUSSION AND CONCLUSION:
Patients tend to have a TKA at a higher rate when joint space narrowing at enrollment is severe and located in the medial compartment, yet subjective scores at enrollment are the same regardless of OA severity. Subjective scores at enrollment will also be similar between those that will have a TKA and those who will not; however, those who will go on to have a TKA have lower scores at 3 and 6 months. Patients that plateau or regress between 1 and 3 months are 4.8 times more likely to have a TKA compared to those that improve in the same timeframe. Conservative treatment can lead to symptom improvement for those with knee OA and this improvement differs by OA location and severity.