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How Symmetric is Component Sizing in Bilateral Primary Total Knee Arthroplasty?

Introduction: Correct sizing of total knee arthroplasty (TKA) components is important for an optimal function and long-term results. A large-sized or undersized femoral component can lead to complications. We seek to estimate incidences of asymmetry of components in a single stage sequential bilateral TKA and its relation to clinical outcomes.

Methods: All patients undergoing primary bilateral TKA for primary osteoarthritis or inflammatory arthritis from January 1, 2013 to February 1, 2019 were included. Complications were recorded with a minimum of one-year follow-up. Univariate analysis was performed with chi-square using Fisher's exact analysis and t-test to assess postoperative outcomes.

Results: 187 patients were included with a mean age of 64.9 years and BMI of 35 kg/m². 27 patients (14.4%) had all 4 components on both sides, and 160 patients had asymmetric components, the most common mismatch being femoral components (40.6%), followed by polyethylene thickness (38.5%), patellar components (36.4%), and tibial components (29.4%). Postoperatively, 2.3% of patients developed adverse events, most common being venous thromboembolism (3.2%). Univariate analysis revealed the rate of adverse events was comparable between patients with symmetric and asymmetric components (9.3% vs 9.4%; p=0.999). The rate of complications wasn't associated with increasing number of asymmetric components present (0: 7.4% vs 1: 7.9% vs 2: 4.9% vs 3: 12.1% vs 4: 16.7%; p=0.24).

Discussion and Conclusion: The high component asymmetry incidence in bilateral TKA could be because we investigated all four TKA components and not just the tibia and femur as done in most studies. There was no statistically difference in the rate of complications between patients with symmetric and asymmetric components, nor any association between number of asymmetric components and rate of complications. Relying only on contralateral TKA sizing may lead to complications; each knee should be sized independently.