Lower Limb Morphotypes Influences Outcomes in Patients Undergoing Total Knee Arthroplasty with Mechanical Alignment

Edoardo Franceschetti[1], Stefano Campi, Giancarlo Giurazza[2], Pietro Gregori[3], Giovanni Perricone, Andrea Tanzilli, Alice Laudisio, Biagio Zampogna[4], Rocco Papalia
[1]Campus Biomedico University Roma, [2]Policlinico Universitario Campus Bio-Medico, [3]Campus Bio-Medico University, [4]Campus Biomedico University Hospital

INTRODUCTION:
Patient dissatisfaction rates following total knee arthroplasty (TKA) reported in the literature reach 20%. The identification of the correct coronal alignment is still heavily debated. The aim of this retrospective study is to compare clinical outcomes in different lower limb alignment morphotypes in patients undergoing mechanical alignment (MA) in TKA.
METHODS:
A retrospective selection was made of 143 patients who underwent TKA with mechanical alignment from April 2021 to June 2022, with a prospective follow up of at least one year. The different knee morphotypes were classified according to the Coronal Plane Alignment of the Knee (CPAK) classification. Clinical outcome evaluations were performed using the Knee Society Score, Oxford Knee Score, Short Form Survey 12, with the addition of the Forgotten Joint Score for the postoperative period only. Differences in clinical outcomes were considered statistically significant with a p-value < .050.
RESULTS:
The varus morphotype showed statistically significant lower results at one year compared to other morphotypes in the Knee Society Score (76.3 vs. 84.9, P=.03), Oxford Knee Score (38.8 vs. 42.7, P=.03), and Forgotten Joint Score (82.6 vs. 91.1, P=.03). The neutral morphotype showed statistically significant superior results compared to other morphotypes in the Knee Society Score (86.6 vs. 78.2, P=.03).
DISCUSSION AND CONCLUSION:
The distribution of knee morphotypes reflects the data found in the literature. Mechanical alignment in TKA does not confer the same clinical outcomes in all morphotypes. The varus morphotype shows significantly inferior results in the postoperative period. Our data support the current of kinematic alignment, where not all knee morphotypes benefit from the same alignment. Furthermore, the superior results in the neutral morphotype, which overlaps with the mechanical alignment in the kinematic perspective, support this hypothesis. The clinical outcomes of patients undergoing mechanical alignment in TKA are not uniform in relation to the morphotype. Further studies are needed to understand if all knee morphotypes do not benefit from the same type of alignment and to identify the most appropriate alignment type based on the specific patient's morphotype.