Comparison of gait analysis pre- and post-unilateral total knee arthroplasty for knee osteoarthritis

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INTRODUCTION: Gait ability can be objectively assessed using gait analysis. Three-dimensional gait analysis, the most commonly used analytical method, has limitations, such as a prolonged examination, high system costs, and inconsistent reported gait symmetry in patients with knee osteoarthritis (KOA). Therefore, we aimed to evaluate the gait symmetry and changes pre- and post-unilateral total knee arthroplasty (TKA) using the Walkway analyzer, a sheet-type gait analyzer.

METHODS: The healthy group included 38 participants from the Locomotor Frailty and Sarcopenia Registry study with lower limb pain or Kellgren-Lawrence classification grade 3 or 4 osteoarthritis (OA). The OA group included 34 participants from the registry study who underwent unilateral TKA. The walking speed, step length, step width, cadence, stride time, stance time, swing phase time, double-limb support phase time, stride, step length, and step width were analyzed per side using the Walkway gait analyzer .

RESULTS SECTION: No significant differences between the right and left sides were observed in the healthy group. In the OA group, the time indices and stance phase (p=0.011) and the double-limb support phase time (p=0.039) were longer on the contralateral side and the swing phase was longer on the affected side (p=0.004) pre-operatively. However, these differences disappeared post-operatively. There were no significant differences in the spatial indices.

DISCUSSION: This study revealed that patients undergoing unilateral TKA had an asymmetric gait pre-operatively, with a time index compensating for the painful side, and an improved symmetric gait post-operatively.

SIGNIFICANCE: The Walkway analyzer employs a simple test that requires only walking; hence its use can be implemented in actual clinical practice.

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IMAGES AND TABLES: