#921 - Posters

Important Indicator For Postoperative Gait Speed After Bilateral Simultaneous Total Knee Arthroplasty

Orthopaedics / Knee & Lower Leg / Joint Replacement - Primary

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Background
In general, patient satisfaction with total knee arthroplasty (TKA) is considered inferior to that of total hip arthroplasty (THA). One reason for this may be that knee osteoarthritis often affects both sides of the knee, and after unilateral TKA, pain or deformity in the contralateral knee joint may appear or progress, affecting overall satisfaction and lower limb function. Gait is the most basic lower limb motion, and gait speed is one of the most important functions. There have been several studies on gait speed after unilateral TKA. However, few reports have examined long-term changes in gait speed after bilateral simultaneous TKA.

Objectives
In this study, we prospectively investigated the change in gait speed before and after bilateral simultaneous TKA and the factors that influence it.

Study Design & Methods
Forty-seven patients who underwent bilateral simultaneous TKA for bilateral medial osteoarthritis of the knee at our hospital from January 2021 to December 2022 were included in the one-year prospective study. Patients were evaluated preoperatively and one year postoperatively. The evaluation data included various scores (JOA score, KOOS, KSS), functional evaluations (knee extensor strength, knee flexor strength, one leg standing time (OLST), functional reach test (FRT), grip strength), and gait speed (comfortable and maximal). Since clinically important gait speed after TKA has not yet been reported, we substituted comfortable gait speed ≥1.34 m/s, a clinically important measure of gait speed in THA, and examined the factors that satisfy the postoperative comfortable gait speed ≥1.34 m/s.

Results
Bilateral simultaneous TKA significantly improved JOA score from 62.2±11.2 to 87.1±6.0, KOOS score from 45.5±16.5 to 85.1±10.2, and KSS score from 42.4±18.1 to 73.6±15.0. ($p<0.05$) In terms of function, knee extension strength and OLST improved significantly($p<0.05$), but knee flexor strength, FRT, and grip strength did not.($P>0.05$) Comfortable gait speed improved from 0.96±0.23 m/s to 1.18±0.18 m/s and maximal gait speed from 1.22±0.32 m/s to 1.47±0.27 m/s.($p<0.05$) The preoperative maximum gait speed had an influence on achieve a good postoperative comfortable gait speed (>1.34 m/s), with a cutoff value of 1.399 m/s (sensitivity: 86.5%, specificity: 80.0%). Factors influencing preoperative maximal gait speed were preoperative knee extensor strength and FRT.

Conclusions
It has been reported that knee extensor strength has an effect on gait speed after TKA, and this was also the

case in this study. In general, knee extensor strength declines the most at 3 months after TKA and recovers to preoperative levels at 6 months. There are some reports that knee extensor strength exceed to preoperative levels at 1 year postoperatively, when considering the relationship with gait speed, it is necessary to observe long-term follow-up, at least one year after surgery. Simultaneous bilateral TKA significantly improved various scores and gait speed. A preoperative maximum gait speed of 1.399 m/s can be used as an indicator for obtaining a good comfortable gait speed one year after surgery. Preoperative knee extension strength and FRT are important for preoperative maximal gait speed. Since FRT does not improve before and after surgery, surgical intervention may be necessary before the FRT declines.