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Postoperative Swelling Remains Elevated Two Years after Total Knee Arthroplasty

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Objectives

Post-operative swelling after total knee arthroplasty (TKA) is common and can contribute to pain, reduced range of motion, muscular inhibition, and impaired function. The purpose of this study was to examine the trajectory of swelling over two years after TKA and evaluate whether swelling is associated with patient-reported outcomes, functional outcomes, and impairment measures.

Design

This secondary analysis of a randomized controlled trial included 136 participants (mean age 64.2±7.2 years; 60% female). Assessments were completed preoperatively and at 10 weeks, 6 months, and 2 years post-TKA. Swelling was quantified using bioelectrical impedance analysis (BIA). Outcomes included patient-reported measures (Western Ontario and McMaster Universities Arthritis Index [WOMAC], satisfaction), functional performance (6-minute walk test [6MWT], 30-second sit-to-stand test [30STS]), and impairments (quadriceps strength, pain during functional tasks, range of motion). Repeated measures ANOVA assessed swelling over time, and Pearson correlations examined associations with outcomes.

Results

Mean swelling was 2.1±7.8% pre-TKA and significantly higher at all follow-up timepoints (15.3±10.6% at 10 weeks, 9.6±7.3% at 6 months, and 5.4±7.1% at 2 years; all $p<0.001$). Only 5% of participants returned to preoperative swelling levels at 10 weeks, 12% at 6 months, and 28% at 2 years. Swelling was modestly associated with WOMAC function preoperatively ($r=0.19$, $p=0.03$) and the 6MWT ($r=0.24$, $p=0.007$).Knee flexion range of motion ($r=-0.21$, $p=0.02$) was associated with swelling at 10 weeks post-TKA, but no significant associations were observed at 6 months or 2 years ($p=0.10–0.95$).

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Conclusions

Post-operative swelling remained elevated compared to pre-TKA levels in most patients even two years after surgery, with only a minority returning to baseline. Associations between swelling and impairments or function were observed in the early recovery period but not at longer follow-ups, suggesting swelling may have a primarily acute impact. Future work should evaluate whether interventions targeting early post-operative swelling can improve long-term recovery.