



ORIGINAL RESEARCH PAPER

Orthopaedics

DOES TIMING OF TOTAL KNEE ARTHROPLASTY INFLUENCE POSTOPERATIVE COMPLICATIONS, MORBIDITY, AND LENGTH OF STAY?

KEY WORDS:

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INTRODUCTION

Total knee arthroplasty (TKA) is one of the most effective surgical interventions for advanced knee osteoarthritis, offering durable pain relief and functional improvement. With the increasing volume of TKA worldwide, optimizing perioperative variables that may influence outcomes has become essential. While surgical technique, implant choice, and patient comorbidities are well-established determinants of outcome, growing evidence suggests that non-clinical factors such as timing of surgery during the day may also influence postoperative morbidity. This study evaluates the relationship between surgical start time and early postoperative outcomes following primary TKA.

MATERIALS AND METHODS

This retrospective cohort study included 103 consecutive patients who underwent primary unilateral total knee arthroplasty at a single tertiary care center between January 2023 and December 2024. Revision procedures were excluded. Patients were stratified into three groups based on surgical start time: Group A (8:00–10:59 AM), Group B (11:00 AM–1:59 PM), and Group C (2:00 PM onward). Variables analyzed included age, sex, operative duration, postoperative complications during index admission, and length of hospital stay. Statistical analysis was performed using one-way ANOVA and chi-square tests, with $p < 0.05$ considered statistically significant.

RESULTS

Demographic characteristics, operative duration, and length of hospital stay were comparable across all three groups, with no statistically significant differences observed. However, postoperative complication rates demonstrated a declining trend across the surgical day, with the highest incidence in Group A and the lowest in Group C. Although this trend did not reach statistical significance ($p = 0.08$), the consistent gradient suggests a possible temporal influence on postoperative outcomes.

DISCUSSION

The observed trend toward higher complication rates in early morning surgeries may be attributed to a combination of circadian physiological variations and institutional scheduling practices. Early morning hours are associated with heightened sympathetic tone, increased platelet activation, and inflammatory mediator release, which may predispose patients to thromboembolic and infectious complications. Additionally, institutional practices such as frontal loading of complex cases into early time slots may confound associations between surgical timing and outcomes. Importantly, no increase in complications was observed in later surgeries, underscoring the role of consistent team performance, standardized workflows, and effective fatigue mitigation strategies.

LIMITATIONS

This study is limited by its retrospective design, modest sample size, and lack of adjustment for comorbidities, frailty indices, ASA grading, and patient-reported outcome measures. These limitations restrict causal inference and highlight the need for prospective studies with more granular risk stratification.

CONCLUSION

This study identifies a possible diurnal trend in postoperative complications following total knee arthroplasty, with early morning surgeries demonstrating higher complication rates. Although statistical significance was not achieved, the findings warrant further investigation through larger, prospective, and multicentric studies incorporating chronobiological insights and detailed patient risk profiling before changes to surgical scheduling practices are recommended.

Funding : None.

Conflict of Interest : None.

Ethical Approval : Not required.

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