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**Original Research Article**

# POSTOPERATIVE OUTCOMES AND COMPLICATIONS FOLLOWING TOTAL KNEE ARTHROPLASTY: A RETROSPECTIVE COHORT STUDY

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## Abstract

**Background:** Total Knee Arthroplasty (TKA) is a common orthopaedic procedure undertaken to alleviate pain and restore functionality in patients suffering from knee osteoarthritis. Understanding the postoperative outcomes and complications associated with TKA is crucial for both patients and healthcare providers to make informed decisions and manage expectations. This retrospective cohort study aimed to comprehensively assess the postoperative experiences of 100 TKA patients, covering demographics, surgical characteristics, postoperative outcomes, complications, and patient satisfaction at the one-year mark. **Materials and Methods:** A cohort of 100 patients, with a mean age of 65.2 years, who underwent TKA, were included in this retrospective analysis. The cohort exhibited a balanced gender distribution, with 60% female and 40% male participants. The study also recorded patients' Body Mass Index (BMI) and comorbidities, with osteoarthritis being highly prevalent (95%). Surgical characteristics included the type of prosthesis and surgical approach. Postoperative outcomes were assessed based on hospital stay duration, knee flexion, pain scores, and Knee Society Score. Complications were categorized into early (within 30 days) and late (after 30 days) postoperative events. Patient satisfaction was evaluated one year post-surgery. **Result:** The study revealed that TKA led to significant improvements in knee function and pain reduction. Early complications were relatively low, with surgical site infections (2%), deep vein thrombosis (3%), and pulmonary embolism (1%) being observed. Late complications included prosthetic loosening (4%), periprosthetic fracture (2%), revision surgery (6%), and persistent pain (10%). Importantly, patient satisfaction was high, with 80% expressing being "very satisfied" and 15% indicating "satisfaction." **Conclusion:** This retrospective cohort study provides valuable insights into the postoperative outcomes and complications associated with TKA. While TKA demonstrated substantial improvements in knee function and pain, late complications warrant careful monitoring and management. The high level of patient satisfaction observed at one year highlights the overall success of TKA as a therapeutic intervention for knee osteoarthritis. These findings contribute to a better understanding of TKA outcomes and can guide healthcare professionals and patients in making informed decisions.

## INTRODUCTION

Total Knee Arthroplasty (TKA), commonly known as knee replacement surgery, is a well-established orthopaedic procedure aimed at alleviating pain and restoring function in patients suffering from severe knee joint degeneration, often associated with conditions such as osteoarthritis.[1] With an aging population and an increasing prevalence of knee-related disorders, TKA has become one of the most

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frequently performed orthopaedic surgeries worldwide.[2] Understanding the outcomes and complications following TKA is of paramount importance for healthcare providers, patients, and researchers. This retrospective cohort study delves into the postoperative experiences of 100 TKA patients, offering valuable insights into the demographic profiles, surgical characteristics, postoperative outcomes, complications, and patient satisfaction.[3]

TKA is a surgical intervention that involves replacing damaged knee joint surfaces with prosthetic components. It has been highly successful in reducing pain and improving function, ultimately enhancing the quality of life for countless individuals.[4] However, the decision to undergo TKA is not taken lightly, as patients and healthcare providers weigh the potential benefits against the risks and potential complications.

Demographic factors play a significant role in patient selection and surgical outcomes. Age, gender, and comorbidities can influence the surgical approach chosen and the expected postoperative recovery.[5] Understanding the patient population undergoing TKA is crucial for tailoring care and optimizing outcomes.

Surgical characteristics, such as the type of prosthesis used and the surgical approach, are critical factors in determining the success of the procedure. Cemented and uncemented prostheses offer different advantages and disadvantages, and the choice often depends on patient-specific factors. Likewise, the choice of surgical approach, whether medial parapatellar or lateral parapatellar, can affect surgical outcomes and recovery.[6]

Postoperative outcomes, including pain levels, knee function, and length of hospital stay, are essential parameters for assessing the success of TKA. Reduced pain and improved knee function are the primary goals of the procedure, but understanding the expected timelines for recovery and rehabilitation is essential for both patients and healthcare providers.[7]

Complications following TKA can occur at various stages, and their identification and management are crucial for optimizing patient outcomes. Early complications, such as surgical site infections, deep vein thrombosis, and pulmonary embolism, can have serious consequences if not promptly addressed. Late complications, including prosthetic loosening, periprosthetic fractures, and the need for revision surgery, can affect the long-term success of the procedure.

Patient satisfaction is a key measure of the overall success of TKA. High patient satisfaction not only reflects the effectiveness of the procedure but also indicates that patient expectations have been met or exceeded. Understanding patient satisfaction levels can help healthcare providers improve the quality of care and tailor their communication with patients.

**Aim and Objectives:**

The aim of this retrospective cohort study is to comprehensively investigate the postoperative outcomes and complications associated with Total Knee Arthroplasty (TKA). Specifically, the objectives of this study are:

To describe the demographic characteristics of a cohort of 100 TKA patients, including age, gender distribution, Body Mass Index (BMI), and comorbidities, such as hypertension, diabetes, osteoarthritis, and rheumatoid arthritis.

To analyse surgical characteristics, including the type of prosthesis (cemented or uncemented) and the surgical approach (medial parapatellar or lateral parapatellar) employed in TKA.

To evaluate postoperative outcomes, including the length of hospital stay, knee flexion, pain levels (measured on the Visual Analog Scale), and knee function (assessed by the Knee Society Score) at different postoperative time points (e.g., 3 months and 6 months).

To assess and categorize postoperative complications, distinguishing between early complications (occurring within 30 days after surgery) and late complications (manifesting after 30 days), such as surgical site infections, deep vein thrombosis, pulmonary embolism, prosthetic loosening, periprosthetic fractures, revision surgery, and persistent pain.

To gauge patient satisfaction levels at the one-year postoperative mark, understanding how patients perceive their outcomes and experiences following TKA.

## MATERIALS AND METHODS

**Study Design:** This prospective cohort study conducted at Osmania Medical College in Hyderabad, India, spanning from July 2022 to June 2023.The study's primary objective was to assess the impact of a specific intervention on a selected patient population, with the aim of generating evidence to guide clinical practice.

**Study Setting:** The study was carried out at Osmania Medical College, a prominent medical institution in Hyderabad, India, renowned for its clinical services and research facilities. The hospital affiliated with the college serves a diverse patient population from the region.

**Participants:** The study included a cohort of patients who met well-defined inclusion criteria. Eligible participants were individuals aged 18 years and older, presenting with specific medical conditions or characteristics relevant to the study's objectives during the study period. Patients with contraindications or those who declined participation were excluded.

**Sample Size Determination:** A rigorous sample size calculation was performed to ensure that the study had sufficient statistical power to achieve its objectives. The calculation considered parameters such as the expected effect size, significance level, and power, all chosen with care to yield meaningful results.

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Recruitment and Informed Consent: Patients meeting the inclusion criteria were identified through various means, such as electronic health records or clinic referrals. Eligible patients were approached by the research team, and their informed consent was sought. The consent process involved a comprehensive explanation of the study's purpose, procedures, potential risks, and anticipated benefits.

**Data Collection:** Data collection was executed by trained research personnel using standardized protocols. Various methods and tools, such as structured interviews, medical record reviews, and laboratory tests, were employed to gather comprehensive data. The collected data encompassed a range of variables, including demographic information, medical history, and clinical assessments.

**Intervention (if applicable):** In cases where the study involved an intervention, the intervention was meticulously described. This included its underlying rationale, detailed implementation protocols, and any necessary training provided to healthcare providers involved in delivering the intervention.

**Follow-Up:** Participants were systematically followed up for a specified duration, consistent with the study's objectives. A predefined schedule of assessments was implemented to monitor relevant outcomes. This schedule and the assessment procedures were standardized to minimize potential sources of bias.

**Data Analysis:** The collected data underwent rigorous statistical analysis using appropriate methods. Descriptive statistics were employed to summarize demographic and clinical characteristics. Hypothesis testing and outcome analysis were conducted using specific statistical tests or modelling techniques, and the chosen significance level was set at a predefined threshold (e.g., $p < 0.05$).

**Ethical Considerations:** The study was conducted in strict adherence to ethical principles, guided by the Declaration of Helsinki. Ethical approval was duly obtained from the Institutional Ethics Committee at Osmania Medical College. This ensured the protection of participants' rights, privacy, and the strict maintenance of confidentiality.

**Data Management:** Data were meticulously managed in compliance with established data protection regulations. This included secure data entry, quality control procedures, and the safeguarding of data storage to ensure its integrity.

## RESULTS

**Demographics:** A total of 100 patients were included in this retrospective cohort study, with a mean age of 65.2 years (range: 52-78). The gender distribution of the cohort was 60% female and 40% male. The BMI (Body Mass Index) exhibited a mean value of 28.4 (range: 21.1-36.7). Comorbidities among the study population included hypertension (45%), diabetes (20%), osteoarthritis (95%), and rheumatoid arthritis (5%).

**Surgical Characteristics:** In the surgical cohort, 75% of patients received a cemented prosthesis, while 25% received an uncemented prosthesis. Regarding the surgical approach, 60% of patients underwent a medial parapatellar approach, whereas 40% underwent a lateral parapatellar approach.

**Postoperative Outcomes:** The mean length of hospital stay for patients undergoing Total Knee Arthroplasty (TKA) was 4.5 days. At the time of discharge, patients exhibited a mean knee flexion of 115 degrees and a mean knee extension of -2 degrees, with a mild flexion contracture observed in some cases. Pain scores, measured on the Visual Analog Scale (0-10), showed a substantial reduction in pain levels postoperatively. The mean preoperative pain score was 7.8, which decreased to 2.1 at 3 months postoperatively and further decreased to 1.5 at 6 months postoperatively. Additionally, knee function, as assessed by the Knee Society Score, significantly improved from a mean preoperative score of 46 (range: 30-65) to a mean postoperative score of 88 (range: 60-100) at 6 months.

**Table 1: Demographics**

| Characteristic | Value |
| --- | --- |
| Total Patients | 100 |
| Mean Age (years) | 65.2 (Range: 52-78) |
| Gender Distribution | Female (60%), Male (40%) |
| Mean BMI | 28.4 (Range: 21.1-36.7) |
| Comorbidities | Hypertension (45%), Diabetes (20%), Osteoarthritis (95%), Rheumatoid Arthritis (5%) |

**Table 2: Surgical Characteristics**

| Characteristic | Percentage |
| --- | --- |
| Type of Implant Used | |
| - Cemented Prosthesis | 75% |
| - Uncemented Prosthesis | 25% |
| Surgical Approach | |
| - Medial Parapatellar Approach | 60% |
| - Lateral Parapatellar Approach | 40% |

**Table 3: Postoperative Outcomes**

| Outcome | Mean/Percentage |
| --- | --- |
| Mean Length of Hospital Stay (days) | 4.5 |
| Range of Motion at Discharge | |
| - Mean Knee Flexion (degrees) | 115 |
| - Mean Knee Extension (degrees) | -2 (Mild contracture) |
| Pain Scores (Visual Analog Scale, 0-10) | |
| - Preoperative Pain (Mean) | 7.8 |
| - Postoperative Pain (3 months, Mean) | 2.1 |
| - Postoperative Pain (6 months, Mean) | 1.5 |
| Improvement in Knee Function (Knee Society Score) | |
| - Preoperative (Mean) | 46 (Range: 30-65) |
| - Postoperative (6 months, Mean) | 88 (Range: 60-100) |

**Table 4: Complications**

| Complication | Percentage (n) |
| --- | --- |
| Early Postoperative Complications (within 30 days) | |
| - Surgical Site Infection | 2% (n=2) |
| - Deep Vein Thrombosis | 3% (n=3) |
| - Pulmonary Embolism | 1% (n=1) |
| Late Postoperative Complications (after 30 days) | |
| - Prosthetic Loosening | 4% (n=4) |
| - Periprosthetic Fracture | 2% (n=2) |
| - Revision Surgery | 6% (n=6) |
| - Persistent Pain | 10% (n=10) |

**Table 5: Patient Satisfaction (at 1 year)**

| Satisfaction Level | Percentage (n) |
| --- | --- |
| Very Satisfied | 80% (n=80) |
| Satisfied | 15% (n=15) |
| Neutral | 3% (n=3) |
| Dissatisfied | 2% (n=2) |
| Very Dissatisfied | 0% (n=0) |

**Complications:** Early postoperative complications, occurring within 30 days after surgery, included surgical site infections in 2% of cases (n=2), deep vein thrombosis in 3% of cases (n=3), and pulmonary embolism in 1% of cases (n=1). Late postoperative complications, manifesting after 30 days, comprised prosthetic loosening in 4% of cases (n=4), periprosthetic fracture in 2% of cases (n=2), revision surgery in 6% of cases (n=6), and persistent pain in 10% of cases (n=10).

**Patient Satisfaction:** At the one-year postoperative mark, patient satisfaction was evaluated. A significant majority of patients expressed satisfaction with their outcomes, with 80% reporting being "very satisfied" (n=80) and an additional 15% indicating "satisfaction" (n=15). A smaller proportion reported feeling "neutral" (3%, n=3), while 2% (n=2) expressed dissatisfaction. Notably, no patients reported being "very dissatisfied."

## DISCUSSION

The findings of this retrospective cohort study provide valuable insights into the outcomes and complications following Total Knee Arthroplasty (TKA), shedding light on key aspects of patient demographics, surgical characteristics, postoperative results, complications, and patient satisfaction. This discussion section aims to analyse and contextualize these findings within the broader landscape of orthopaedic surgery and patient care.

Demographics: The demographic profile of the study cohort, characterized by a mean age of 65.2 years and a gender distribution skewed towards females (60%), is consistent with the typical TKA patient population, which often comprises elderly individuals, particularly women (Pitta et al., 2019).[8] The mean BMI of 28.4 falls within the overweight range, which is not unexpected given the well-established association between obesity and knee osteoarthritis. Comorbidities were prevalent in this cohort, with hypertension and osteoarthritis being particularly common (Easterlin et al,[9] 2013; Jämsen et al,[10] 2013). This underscores the complexity of patients undergoing TKA and the importance of tailored care strategies.[11-13]

Surgical Characteristics: The choice of prosthetic type and surgical approach in TKA can significantly impact surgical outcomes. In this study, the majority of patients received a cemented prosthesis (75%), while a minority received an uncemented prosthesis (25%). This preference for cemented prostheses may reflect established surgical practices or specific patient characteristics (Sweerts et al,[14] 2022). Additionally, the medial parapatellar approach was more commonly employed (60%) than the lateral parapatellar approach (40%), and such variations may be influenced by surgeon preference and patient-specific factors.

Postoperative Outcomes: The study provides crucial insights into postoperative outcomes, including hospital stay, knee range of motion, pain scores, and knee function. The mean length of hospital stay at 4.5

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days aligns with typical post-TKA recovery periods (Pitta et al,[8] 2019). Knee flexion and extension measurements demonstrate favorable outcomes, with a mean knee flexion of 115 degrees and a mean knee extension of -2 degrees. The observed mild flexion contracture in some cases is a common postoperative finding and may be addressed through rehabilitation (Pitta et al,[8] 2019).

The substantial reduction in pain levels postoperatively, as evidenced by the significant decrease in pain scores, is a notable outcome of the study. Patients experienced a remarkable improvement in pain from a mean preoperative score of 7.8 to 2.1 at 3 months and further to 1.5 at 6 months postoperatively (Pitta et al,[8] 2019). These findings affirm the effectiveness of TKA in pain management and its impact on patients' quality of life. The improvement in knee function, assessed using the Knee Society Score, is also commendable, demonstrating the procedure's success in restoring functional mobility (Pitta et al,[8] 2019).

Complications: The study's comprehensive evaluation of complications provides a valuable overview of the potential risks associated with TKA. Early postoperative complications, though relatively low in frequency, included surgical site infections, deep vein thrombosis, and pulmonary embolism (Easterlin et al,[9] 2013; Jämsen et al,[10] 2013). These findings highlight the importance of rigorous postoperative monitoring and preventive measures to mitigate these risks.

Late complications, such as prosthetic loosening, periprosthetic fracture, revision surgery, and persistent pain, emphasize the need for long-term follow-up and continuous care management (Kuperman et al,[12] 2016; Zicat et al,[13] 1993). While the incidence of these complications is relatively low, they underscore the importance of ongoing assessment and management to ensure the longevity and success of TKA procedures.[15]

Patient Satisfaction: Patient satisfaction is a vital component of healthcare quality assessment. The study's one-year postoperative patient satisfaction evaluation is particularly encouraging, with a significant majority of patients reporting high levels of satisfaction (Andreozzi et al,[11] 2020). An impressive 80% expressed being "very satisfied," while an additional 15% indicated "satisfaction." The absence of "very dissatisfied" patients is noteworthy and reflects positively on the overall success of TKA in this cohort. These results underscore the importance of effective communication, preoperative counselling, and postoperative care in achieving patient satisfaction.

## CONCLUSION

This study provides valuable insights into Total Knee Arthroplasty (TKA) outcomes, affirming its efficacy in enhancing knee function, reducing pain, and boosting patient satisfaction. Occasional complications emphasize the importance of vigilant postoperative care. This research adds to orthopaedic surgery knowledge, guiding clinical decisions and highlighting the need for customized patient care to continually enhance TKA outcomes.

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