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CLINICAL AND FUNCTIONAL OUTCOME OF PRIMARY TOTAL KNEE ARTHROPLASTY IN MORBIDLY OBESE PATIENTS; A CROSS-SECTIONAL STUDY

Zahir Khan[1], Anwar Imran[2*], Farhan Qazi[3], Sajid Akhtar[4], Alamgir Khan[5], Bashir Khan[6]

[1]Department of Orthopedic, MTI Mardan Medical Complex, Mardan, KP – Pakistan
[2*]Department of Orthopedic, Jinnah Teaching Hospital, Peshawar, KP - Pakistan
[3]Department of Orthopedic, Pak International Medical College, Peshawar, KP – Pakistan
[4]Department of Orthopedic Saidu Teaching Hospital Swat, KP – Pakistan
[5]Department of Surgery, MTI Mardan Medical Complex, Mardan, KP – Pakistan

***Corresponding Author:** Anwar Imran
*Assistant Professor, Department of Orthopedic Surgery, Jinnah Teaching Hospital, Peshawar, KP – Pakistan Email: dranwarbangash@gmail.com

ABSTRACT:
Objective: To evaluate the results of primary TKA in morbidly obese patients according to the clinical and functional parameters.
Study Design: A cross sectional study
Place and Duration of Study: Department of Orthopedic Mardan Medical Complex Mardan from Jan 2021 to July 2021
Methodology: A cross sectional study conducted at the department of orthopedic in MMC Mardan. Particularly the study involved morbidly obese patients, that is, the patients with body mass index (BMI) of 40 kilograms per meter square or higher undergoing primary TKA. Pre- and two-year follow-up AKSS were collected and compared using an independent t test to indicate the level of statistical significance ($p < 0.05$).
Results: out Of 200 patients, incisions were made for a total of two surgeries, and 180 (90. 2%) of them had bilateral TKA, and 10 (5. 2%) had unilateral TKA. As shown by the results, the mean age of the participants of the study was equal to 61. 01 ± 7. This is followed by 01 years involving 176 female patients and only 20 male patients with 81 . Most (62. 2%, n = 124) were categorized within the moderately obese to obese range with a BMI of between 38 and 48 . They were divided into three groups; 120 (59.); 57 (28.); and 80 (39. The clinical AKSS (Pain, Stability and ROM) at one year follow-up confirmed the results of the study and all the patients has significant improvement ($p < 0.05$) where as the functional AKSS (Walking distance, Stair climbing and descending) as evaluated by the functional AKSS did not had significant improvement ($p > 0.05$).
Conclusion: In morbidly obese patients primary TKA, the results showed an improved clinical status in both pain, stability, and range of motion but did not impact functional status as measured by distance walking and stair climbing.
Keywords: Total Knee Arthroplasty, Morbidly Obese Patients, Patients 'Clinical Outcome, Patients Functional Outcome

INTRODUCTION

Total knee arthroplasty (TKA) is known and accepted procedure for human beings suffering from end-stage knee osteoarthritis (OA) and helps in reduction of pain and provides functional

improvement and enhances the overall quality of life of patient [1]. However, morbid obesity can be a concern that might hinder the achievement of the best TKA in regards to the augmented risk of surgery complications and post-operative challenges associated with the condition [2]. Morbid obesity is defined using body mass index (BMI) where any BMI of 40 kg/m² and above will be considered [3]. They are exposed to a more mechanical stress on the weight bearing joints and hence are likely to have a faster progression of OA. Therefore, the morbidly obese patient tend to undergo TKA at a relatively younger age than compared to the non-obese patients [4]. The literature regarding any type of TKA in MO patients shows contradictory reports. One recent study states that Former studies indicate that morbid obesity is not a contraindication to cardiac surgery some other studies outline that morbidly obese patients are able to get results that are not significantly different from those of non-obese patients [5]. However, other studies propose that the rates of these complications are higher Other studies have focused on investigating the patient outcomes of primary TKA in patients who are morbidly obese, but none of them evaluated both clinical and functional status. Particularly, the American Knee Society Score (AKSS) assessed before the operation and after the TKA will be used to assess the extent of the pain, joint stability and joint movement provided by the operation [6]. Moreover, we will look at functional capacities such as the distance the patient walked, how many stairs the patient was able to climb, and how well this patient can go down the stairs [7]. The study of morbid obesity on TKA can help fine-tune the identification of ideal candidates for TKA, the approaches to performing the surgery as well as the postoperative management. In this format, we can pique an understanding of TKA in this patient population, little by little clarifying the advantages and disadvantages to improve individual counseling, surgical interventions, as well as rehabilitation of patients this procedure [8].

METHODOLOGY

In this study, cross sectional descriptive analysis was carried out at the Department of Orthopedics in MMC Mardan. The study included patients with an American Society of Anesthesiologists Physical Status (ASA PS) class of 1–3 who were morbidly obese (BMI ≥ 40 kg/m²) scheduled for unilateral primary TKA. Patient medical records were used to extract information on demographic data, presence of chronic diseases, surgical procedures, and Pre-AKSS and Post-AKSS scores. Descriptive statistics and t test were conducted by statistical software 'SPSS version 24. 0' of 'IBM Company' located in Armonk, New York, USA. Patient demographics and baseline characteristics were presented using frequencies and percentages, while matched t-tests were used in comparing pre- and postoperative AKSS scores ($p < 0.05$).

Data Collection

Demographic details, co morbidities of patients and details relating to the surgery were obtained from patient records. Clinical and functional scores of the patients were assessed with the use of American Knee Society Score (AKSS) both before and after the surgery.

Statistical Analysis

Data analysis was done with the help of SPSS software, and the version used was 24. 0. Patient information was captured in descriptive statistics. Inferential statistics, particularly the paired t-tests were used to find out the statistical significance of the difference between the two time points with an alpha level of 0. 05.

RESULTS

First, we examined 200 morbidly obese patients who had primary TKA and the patients were 61. 01 years on average. A majority of the patients, 90. 2%, received both knees operated on, through bilateral TKA. In terms of BMI, Greatest of patients, 62. 2% were presented with the BMI level of between 38 and 48. 8 kg/m², 39. 8% had a BMI> 50 kg/m². The clinical changes in the knee joint were evaluated to be significant at one-year follow-up when assessed with AKSS which shows the pain relief, joint stability and range of motion ($p<0.05$). However, regarding the functional results measurements of walking distance, number of stairs climbed and descending and the ease of the

procedure, there were no significant improvements postoperatively (p > 0. 05). Based on these observations, it can be concluded that primary TKA in morbidly obese patients brings clinically relevant treatments but they do not necessarily realign functional improvements. More investigation is needed before the implementation of an interventional technique that aims to enhance the finest functional outcomes for patients like these.

Table 1: Demographics and Surgical Details

Characteristics	Values
Total Patients	200
Mean Age (years)	61.01
Gender (Female/Male)	176/20
Type of Surgery	
- Bilateral TKA	180 (90.2%)
- Unilateral TKA	10 (5.2%)
BMI Distribution	
- 38-48 kg/m²	120 (59.0%)
- 49-50 kg/m²	57 (28.0%)
- >50 kg/m²	80 (39.8%)

Table 2: Clinical Outcomes at One-Year Follow-Up

Clinical Parameters	Improvement (p < 0.05)
Pain	Yes
Joint Stability	Yes
Range of Motion	Yes

Table 3: Functional Outcomes at One-Year Follow-Up

Functional Parameters	Improvement (p > 0.05)
Walking Distance	No
Stair Climbing	No
Descending	No

Table 4: BMI Distribution

BMI Range (kg/m²)	Number of Patients
38-48	120
49-50	57
>50	80

Table 5: Summary of Significant Findings

Outcome	Result
Clinical Status	Improved in pain, stability, and ROM (p < 0.05)
Functional Status	No significant improvement in walking distance, stair climbing, and descending (p > 0.05)

DISCUSSION

TKA continues to be a hallmark in the treatment of the last stage of knee OA as it is renowned for providing significant relief to patients in terms of pain and improvement in their quality of life [9]. But, there has been increasing concern over obesity and more so morbid obesity which is defined as an individual with BMI greater than 40 kg/m 2 and for this reason there is need to analysis TKA

outcome with this group [10]. Obesity especially in the mortib form has its special problems in orthopedic operations; its risk factor is not only an increased preoperative danger but also different biomechanics, metabolic disorders and probably compromised post operative rehabilitation [11]. Therefore, the question of whether or not TKA provides viable solutions for morbidly obese patients remains an issue of discussion in the field of orthopedics. The decision to consider TKA in MO individuals depend on on multidimensional analysis of risks and benefits which has been described in the literature [12]. On one hand, knee OA due to the loss of cartilage surface and joint space narrowing severely restrict the mobility and presents with moderate pain that inevitably requires surgery irrespective of the weight status of the individual [13]. On the contrary, it would be completely naive to ignore the influence of obesity on the surgical results, as well as on the durability of the implant and functional rehabilitation of the patient [14]. The previously expressed fears of worsened complications, including wound healing issues, infection rates, and the presence of implant failure have constrained optimism towards TKA in morbidly obesity patients [15]. The data available to present an understanding of the various repercussion of TKA in morphid obesity MTI is mixed and therefore diverse [16]. Contrasting studies, some research encompasses clinical efficacy and implant survival rate, which is not significantly different between obese and non-obeste patient [17], other propose difference inconveniences and functional enhancement [18]. In addition, despite the general concerns about obesity being associated with reduced prosthetic survivorship, less attention has been given to investigating the effects of obesity in the long term in terms of its effects on prosthetic wear and tear and on patient reported outcomes [19]. Therefore, there is a highly publishing significant need to explicate details of TKA outcomes in morbid obesity to improve strategisation of clinical management and patients' care trajectories. When it comes to TKA outcomes in morbidly obese patient, this study utilized the American Knee Society Score (AKSS) as an assessment tool which is both reliable and valid, includes both clinical and functional assessment [20]. The AKSS provides pain, joint stability, ROM, and functional measures which give a global measure of surgical effectiveness, hence forms a framework for a one-point appraisal of the surgery [21]. It is therefore important to conceptualise postoperative recovery based on these domains and present the process of recovery after TKA in morbidly obese patients so that clinicians can better understand the qualitative aspects of the process. However, it can be argued that, although data presented in the study are informative in terms of clinical outcomes, information on the sociodemographic and comorbid characteristics of candidates to TKA who are morbidly obese is no less relevant [22]. Variables like age, sex, presence of comorbid conditions, and the socioeconomic condition of an individual can all have powerful impacts that may either controllably or unconsciously influence surgical results [23]. Implementing sociodemographic filters to TKA outcomes analysis, it is possible to better identify clients at risk to face disparities and elaborate personalized postoperative care programs taking advantage of discovered patterns. In light of these considerations, this study aims at providing an extensive scrutiny of the clinical and functional results of primary TKA in morbidly obese patients[24]. AKSS will be used as a primary tool for evaluating TKA outcomes in the following study design: patients' characteristics, other demographic data, and available surgical data will be collected of both groups; preoperative and 2-year postoperative AKSS scores will be compared between groups and among subgroups based on demographic and surgical variables[25]. It is in this vein that we hope to better appreciate aspects of TKA relative to patients of morbid obesity that will best serve to underpin clinical decision-making, patient characterization for TKA candidacy, and the general framework of patient care in regard to morbid obesity and the choice of TKA. Finally, to contribute to the overall understanding of TKA outcomes in morbidly obese patients, it is our goal to provide a better understanding of patient counseling, the role of shared decision making between patient and physician, and ultimately the quality of care in those population subgroups [26].

CONCLUSION

TKA Primary in morbid obesity patients shows the gains in parameters of inflammation as pain and joint stability while other functional aspects like walking distance and stair climbing do not register

much of an improvement. Well more study to needed to enhance the functional outcomes of this population.

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Authors Contribution

Concept & Design of Study: **Zahir Khan**
Drafting: **Anwar Imran**
Data Analysis: **Farhan Qazi , Sajid Akhtar**
Revisiting Critically: **Alamgir Khan, Bashir Khan**
Final Approval of version: **Zahir Khan**

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