

Outcomes of Total Knee Arthroplasty in Varus vs Valgus KneesVaishya Pratik Ashok¹, Kata Manoj Kumar², Lohith N.³¹Junior Resident, Department of Orthopaedics, Rajarajeswari Medical College and Hospital, Bengaluru, Karnataka, India²Assistant Professor, Department of Orthopaedics, Rajarajeswari Medical College and Hospital, Bengaluru, Karnataka, India³Assistant Professor, Department of Orthopaedics, Rajarajeswari Medical College and Hospital, Bengaluru, Karnataka, India

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Conflict of interest: Nil

Abstract:**Background:** Coronal plane deformities such as varus and valgus alignment influence surgical complexity and postoperative outcomes in total knee arthroplasty (TKA). This study aimed to compare functional and radiological outcomes of TKA in varus and valgus knees.**Methods:** This retrospective study included 72 patients who underwent primary TKA over 18 months. Patients were divided into varus (n=46) and valgus (n=26) groups based on preoperative alignment. Functional outcomes were assessed using Knee Society Score (KSS), range of motion (ROM), and pain scores. Radiological correction and complications were analyzed. Statistical analysis was performed using independent t-test and chi-square test. A p-value ≤ 0.05 was considered significant.**Results:** Both groups showed significant improvement after surgery. Postoperative KSS was higher in varus knees (88.6 ± 6.2) compared to valgus knees (84.3 ± 7.1) ($p=0.01$). Mean ROM was $118.2^\circ \pm 8.4$ in varus knees and $112.6^\circ \pm 9.1$ in valgus knees ($p=0.02$). Complications were slightly higher in valgus knees (15.3%) compared to varus knees (8.7%) but were not statistically significant ($p=0.36$).**Conclusion:** Total knee arthroplasty provides good outcomes in both varus and valgus deformities. However, varus knees demonstrated slightly better functional outcomes and range of motion. Valgus knees remain surgically more challenging with marginally higher complication rates.**Keywords:** Knee Arthroplasty, Varus, Valgus Knees, Deformities, Coronal Plane, Knee Society Score (KSS).**DOI:** 10.25258/ijcpr.18.1.278This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

For patients with severe knee osteoarthritis, total knee arthroplasty (TKA) is a proven and successful surgical technique that improves functional mobility and relieves pain. In arthritic knees, coronal plane deformities specifically, varus and valgus malalignment—are commonly seen and are crucial for surgical planning. Implant placement, bone resection, soft tissue balance, and overall surgical complexity are all impacted by these abnormalities [1].

Patients with knee osteoarthritis are more likely to have varus deformity, which is usually linked to deterioration of the knee joint's medial compartment [2]. Valgus deformity, on the other hand, is comparatively uncommon but frequently poses more technical difficulties during surgery because of lateral soft tissue tightness, ligament imbalance, and potential bone abnormalities. For optimal alignment and long-term implant longevity, these abnormalities must be properly corrected [3].

Comparing the clinical and functional results of patients with varus and valgus deformities is still of clinical interest, despite the fact that total knee arthroplasty has been demonstrated to significantly reduce pain and improve function in these individuals. A deeper comprehension of these distinctions could aid surgeons in preoperative planning and enhance patient education about anticipated results [4]. In order to examine the clinical and functional results of total knee arthroplasty in patients with varus and valgus knee abnormalities, the current study was conducted.

Materials and Methods**Study Design:** Retrospective observational study.**Study Period:** 18 months.**Sample Size:** 72 patients undergoing primary TKA.

- Varus knees: 46 patients

- Valgus knees: 26 patients

Inclusion Criteria

- Primary osteoarthritis
- Age >50 years
- Primary TKA
- Minimum follow-up 6 months

Exclusion Criteria

- Revision TKA
- Inflammatory arthritis
- Previous knee surgery
- Neuromuscular disorders

Data Collection

Hospital records were reviewed for:

- Age

- Sex
- BMI
- Preoperative deformity
- Knee Society Score
- Range of Motion
- Pain score (VAS)
- Radiological alignment
- Complications

Statistical Analysis: SPSS version 27 was used to analyze the data. Categorical variables were displayed as percentages, whereas numerical variables were given as mean \pm standard deviation. Continuous and categorical variables were compared using the independent t-test and chi-square test, respectively, and a p-value of less than 0.05 was deemed statistically significant.

Results

Table 1: Demographic Characteristics

Variable	Varus (n=46)	Valgus (n=26)	p-value
Age (years)	66.4 \pm 7.2	67.1 \pm 6.8	0.64
Female (%)	32 (69%)	18 (69%)	0.98
BMI (kg/m ²)	27.3 \pm 3.1	26.8 \pm 3.5	0.52

Table 2: Functional Outcomes

Outcome	Varus	Valgus	p-value
Preoperative KSS	42.1 \pm 8.2	41.4 \pm 7.9	0.71
Postoperative KSS	88.6 \pm 6.2	84.3 \pm 7.1	0.01
Improvement	46.5 \pm 7.3	42.9 \pm 8.1	0.04

Table 3: Range of Motion

Parameter	Varus	Valgus	p-value
Preoperative ROM	92.4° \pm 12.1	90.7° \pm 13.4	0.58
Postoperative ROM	118.2° \pm 8.4	112.6° \pm 9.1	0.02

Table 4: Complications

Complication	Varus	Valgus	p-value
Infection	1	1	
Stiffness	2	2	
Instability	1	1	
Total (%)	8.7%	15.3%	0.36

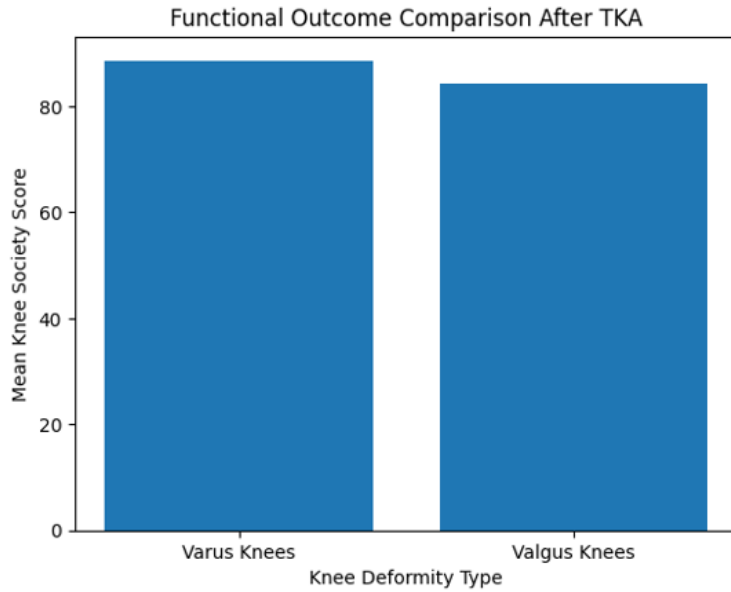


Figure 1: Functional Outcome Comparison after TKA

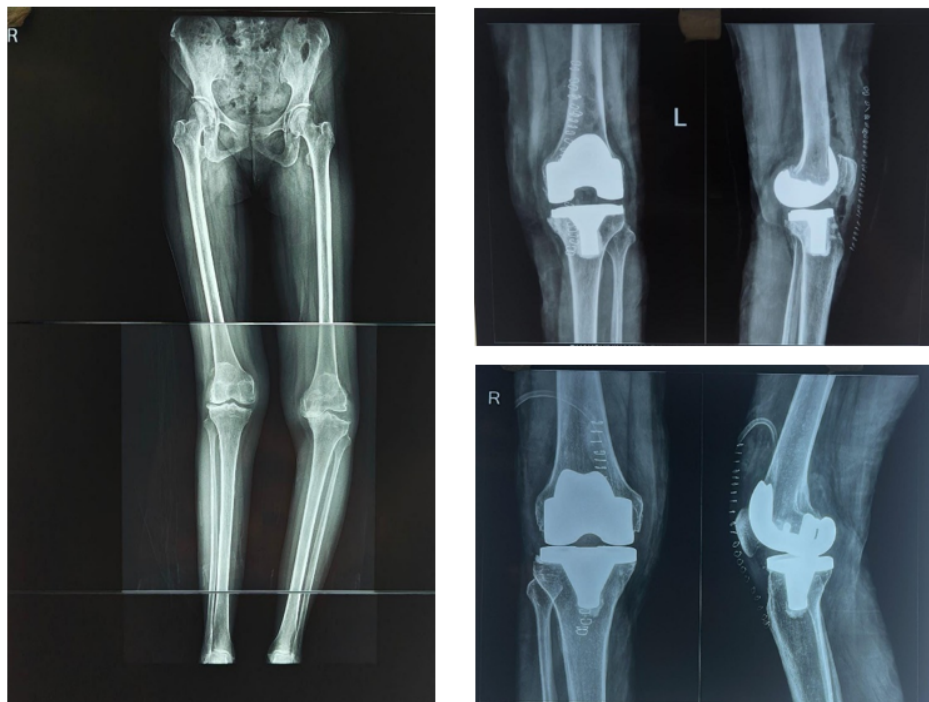


Figure 2: represents the right and left section

Discussion

The clinical and functional results of total knee arthroplasty (TKA) in patients with valgus and varus knee abnormalities were compared in this retrospective study. In line with the increased frequency of medial compartment osteoarthritis, varus deformity accounted for the majority of cases [5]. Following surgery, the Knee Society Scores of both the varus and valgus groups showed a considerable improvement, suggesting that TKA is useful in reducing pain and enhancing function in

both abnormalities [6].

In contrast to patients with valgus deformity, those with varus knees demonstrated much higher postoperative functional scores. This discrepancy could be explained by more predictable deformity restoration in varus knees and comparatively simpler soft tissue balance. Both groups showed improvements in range of motion, but varus knees had a greater ultimate range of motion. Prior research has shown a similar correlation between valgus abnormalities and increase surgical

difficulty.

Complication rates were somewhat greater for valgus knees, but the difference was not statistically significant. Ligament imbalance, lateral soft tissue contractures, and technical difficulties during surgery could all be contributing factors. Both groups showed excellent radiological correction, indicating that TKA successfully restores mechanical alignment irrespective of the kind of deformity [7]. Although valgus knees continue to be more technically challenging, the study shows that total knee arthroplasty offers good results for both varus and valgus abnormalities [4].

Conclusion

For patients with both varus and valgus knee abnormalities, total knee arthroplasty (TKA) offers remarkable functional improvement and exceptional pain relief. Due to easier soft tissue balancing and more predictable correction, varus knees showed somewhat better postoperative functional outcomes and greater range of motion improvement than valgus knees. More surgical complexity and somewhat higher complication rates were linked to valgus abnormalities. Notwithstanding these variations, total knee arthroplasty is still a dependable and successful treatment for severe osteoarthritis of the knee, offering patients with both varus and valgus deformities good clinical and functional results.

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